August 26, 2010

Mr. Joshua P. Cook, P.E.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway
Albany, New York 12233-7014

**RE: Post-Remedial Monitoring Well Network Installation Work Plan**
**DeLaval ERP Project, City of Poughkeepsie, New York**
**Site ID No. B00191-3**
**CHA Project Number: 14357.1009.1102**

Dear Mr. Cook:

CHA has prepared this letter to serve as a Monitoring Well Installation Work Plan relative to the installation of the post-remediation monitoring well network at the DeLaval ERP Site, located off the intersection of Rinaldi Boulevard and Pine Street in the City of Poughkeepsie, Dutchess County, New York. As you are already aware, the monitoring wells originally installed at the Site during the previous subsurface investigations were abandoned at the beginning of the remedial construction due to the proposed grade changes at these locations as well as conflicts with the future redevelopment amenities. The monitoring network described herein is based upon CHA discussions with the Department and your comments on the Draft Site Management Plan (SMP) submitted via a letter to CHA, dated April 30, 2010.

The Monitoring Plan described the SMP for the Site outlines the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site. Specifically, one of the major elements of this monitoring plan includes annual groundwater sampling to monitor trends in contaminant levels in groundwater in the affected areas to determine if the remedy continues to be affective in achieving remedial goals. Prior to starting the groundwater monitoring program, however, a new network of wells must be installed, as further described below.

## Monitoring Well Network Description

Specifically, the post-remediation monitoring well network will include the installation of nine (9) monitoring wells, as shown on the attached Figure 1 – Monitoring Well Location Map. The network layout of on-Site wells has been designed based upon the following criteria:

- One (1) monitoring well will be installed up-gradient of each AOC to provide monitoring of groundwater quality up-gradient of these areas. Specifically, well MW-4 will be installed up-gradient of AOC-1 and well MW-8 will be installed up-gradient of AOC-2/3.

- Two (2) monitoring wells will be installed down-gradient of each AOC, with one to be installed at each end (north and south) of each bulkhead. Given that the bulkheads were installed as containment structures, the wells will be placed near the bulkhead return walls where there is the greatest potential for groundwater migration around the bulkhead and into the Hudson River. Specifically, to monitor AOC-1, wells MW-1 and MW-2 will be installed at the south and north ends of the Zone 1 bulkhead, respectively. To monitor AOC-2/3, wells MW-5 and MW-6 will be installed at the south and north ends of the Zone 3 bulkhead, respectively.

- One (1) monitoring well will be installed near the center of each AOC. Specifically, well MW-3 will be installed near the center of AOC-1 and well MW-7 will be installed near the center of AOC-2/3. These wells will be used for gauging purposes and monitoring for the presence or absence of free product (NAPLs) only. These wells will <u>not</u> be sampled annually along with the other wells in the monitoring network.

- Well MW-9 was installed along the existing concrete retaining wall up-gradient of AOC-2/3. During remedial construction, contaminated soils were encountered in this area in close proximity to the retaining wall; however, the extent of the soil removal was terminated approximately 10-feet west of the retaining wall to avoid disturbance to the wall and foundation system. During the remediation, field evidence suggesting a potential additional up-gradient source or off-site source of contamination was observed in this area. The NYSDEC agreed with CHA that further excavation to the east during the remediation phase of the project may have undermined the foundation of the retaining wall; however, the State required that a well be installed at this location to monitor groundwater quality and to evaluate the need for future remediation up-gradient of this location.

**<u>Procedures for Installation of the Monitoring Wells</u>**

At each proposed well location, a borehole will be advanced using hollow stem auger methods (HSA) to facilitate penetration through the on-Site soils and materials. A truck-mounted HSA rig will be used to facilitate access to all areas. The boreholes will generally be advanced to a depth of approximately seven (7) to eight (8) feet into the groundwater table, such that when a ten (10)-foot long well screen in installed in the borehole, the screen will straddle the water table, but still have freeboard to accommodate a rise in the water table at high tide. However, this will not be possible for some of the shallower monitoring wells located near the waterfront, as described further in the procedures below. The maximum depth of each boring is expected to be 20 feet below ground surface.

The following procedure will be utilized for advancing each borehole:

1. CHA's subcontractor will call Dig Safely New York (1-800-962-7962) for utility clearance a minimum of three (3) working days prior to commencement of drilling activities.

2. All drilling appurtenances, including, but not limited to the augers, casings, rods, and samplers will be cleaned before initiating each boring and before leaving the Site utilizing a steam cleaner from a potable water source. While the split spoon sampler(s) will be steam cleaned between each boring, they will also washed with a mixture of low-phosphate detergent followed by a rinse of distilled water and air drying between each sample for a particular boring.

3. Each boring will be advanced using 4-1/4 inch diameter HSAs with a minimum outside diameter of 7-1/2 inches.

4. Soils samples will be collected continuously using a standard 1-3/8-inch diameter split spoon sampler, in accordance with ASTM D-1586, 1984.

5. The drive hammer assembly will consist of a hammer, manufactured specifically for standard penetration testing, with a nominal weight of 140 pounds, and a guide permitting a free fall of 30 inches in accordance with the requirements of ASTM D-1586, 1984. Special precaution will be taken to ensure that the energy of the falling hammer is not reduced by friction between the hammer and the guide.

6. With the sampler resting on the bottom of the borehole, the sampler will be driven with blows from the drive hammer falling 30 inches until a penetration of 24 inches has been achieved or one hundred (100) blows have been applied for a penetration of two (2) inches or less which will be considered refusal.

7. For each sample taken, the number of blows required for each 6 inches of penetration or fraction thereof will be recorded on the driller's log. If the penetration is less than 12 inches, the Driller's log will record the number of blows and the number of inches penetrated. If a sample is not recovered or is found unsatisfactory in size or condition, a second attempt will be made to obtain a satisfactory sample before advancing the borehole to a lower depth.

8. In additional to classifying the subsurface soils at each boring location, a CHA scientist or engineer will screen the soils for visual, olfactory and photoionic evidence of contamination. An example soil boring log has been included in Attachment A. However, given that these borings are not being installed for geotechnical purposes and that the site investigation and remedial action have already been completed (except for bulkhead coating repairs and soil cover system installation), no samples will be collected for analysis.

9. Unless there is evidence of gross-contamination in the drill cuttings, all cuttings will be left on-Site for re-use. These cuttings will be placed under the final soil cover system.

Once the boreholes have reached the target depth, as determined by CHA's site representative, a monitoring well will be installed at each location. The wells will be installed in accordance with the following procedures:

1. A ten (10) foot long section of two (2) inch diameter, Schedule 40 PVC, 0.010-inch factory slotted well screen attached to a solid-wall riser pipe will be emplaced into the borehole. The well screen will extend approximately seven (7) to eight (8) feet into the groundwater table or to a depth ordered by CHA. The riser pipe will consist of two (2) inch diameter, Schedule 40 PVC, solid wall pipe.

2. No. 00 Jersey Sand will be added to the annulus while the hollow stem auger casing is being slowly removed to a level of at least six (6) inches feet above the screen. While one (1) to two (2) feet is preferred, this will not be possible to achieve for some of the shallower wells near the waterfront.

3. A minimum of an eighteen (18) inch layer of sodium bentonite pellets will then be installed into the annulus, on top of sandpack. This seal will be hydrated with a potable water source. Again, while a two (2)-foot thick well seal is preferred over the sandpack, this will not be possible to achieve for some of the shallower wells near the waterfront.

4. A bentonite-cement grout will then be placed into the well bore with a tremie pipe concurrently with the removal of the hollow stem augers. The grouting will cease when the grout reaches a level approximately one (1) two (2) feet from the ground surface. In the case of shallower wells, the concrete surface seal will be placed directly on top of the bentonite seal and no grouting will be necessary. In most cases, well requiring grout will have a three (3) foot vertical annular space to grout or less, and the driller may be permitted to add additional bentonite pellets in lieu of mixing small batches of grout to fill this annular space.

5. The well will be finished with a flush-mounted casing installed near the final proposed developer elevation and set in a concrete surface seal pad. The flush-mount casing will be a minimum of six (6) inches in diameter and will include a bolt-on cap with a rubber seal to minimize the potential for surface water intrusion. The cap will indicate "Monitoring Well" and will be bolted on to the casing in at least two locations. The concrete pad around the well casting will be a minimum of 18-inches in total depth and will be poured with concrete having a 28-day strength of at least 3,000 PSI.

   Since the final grades are anticipated to be higher than the current Site grades, the concrete surface seal will be poured in a twenty-four (24)-inch diameter SonoTube. While the overall depth of the concrete will be no less than eighteen (18) inches, the pads will also extend a minimum of six (6) inches beneath the current Site grades (based upon the topographic information provided by the future developer on February 9, 2010) and will extend to the final developer grades. The following table summarizes the current and proposed grades at each well location (all elevations are in feet above mean sea level (AMSL)), and show how much the wells will extend above the current ground surface:

| Well No. | Proposed Elevation | Existing Elevation | Change in Elevation |
|---|---|---|---|
| MW-1 | 6.0 | 5.0 | +1.0 |
| MW-2 | 6.0 | 5.0 | +1.0 |
| MW-3 | 7.1 | 6.8 | +0.3 |
| MW-4 | 11.6 | 11.6 | 0.0 |
| MW-5 | 6.0 | 5.0 | +1.0 |
| MW-6 | 6.0 | 5.0 | +1.0 |
| MW-7 | 10.7 | 7.0 | +3.7 |
| MW-8 | 11.6 | 11.2 | +0.4 |
| MW-9 | 11.5 | 11.0 | +0.5 |

6. The PVC riser pipe will be extended to a height of one (1) to three (3) inches beneath the well cap. A "v-notch will be cut in the top of each riser to provide a consistent point for gauging the wells. A rubber gripper plug will be installed on top of the riser pipe and a weather-resistant padlock will secure each well. All locks will be keyed alike and a minimum of two keys should be provided to both the Engineer and the Owner.

7. Based on field conditions, should the groundwater elevation be too high to allow for the well construction in accordance with the above procedure, a modified well construction will be utilized to allow the best possible well seal. All pertinent monitoring well information will be recorded on well construction diagrams. An example well construction diagram log has been included in Attachment B for reference.

   The table included in Attachment C provides a summary of anticipated well construction methodology based upon anticipated groundwater elevations. While the actual well construction will vary based upon actual conditions encountered in the field, the well construction scenarios presented in the table are based upon ground water levels observed during the remedial construction. As can be inferred from the table below, standard well construction is not anticipated to be feasible for wells located near the shoreline (e.g. wells MW-1, MW02, MW-3, MW-5 & MW-6).

8. Once the grout and wells seals are provided sufficient cure time, each well will be developed. The wells will be developed using several cycles of surging and water evacuation (using a bailer or purge pump) until the purge water has a turbidity of less than 50 Nephelometric Turbidity Units (NTUs) or for a maximum of two (2) hours.

9. All decon and purge water will be collected and placed into 55-gallon drums for future characterization and disposal. CHA will coordinate the characterization sampling and off-site disposal of this investigation derived material (IDM).

10. In accordance with the SMP for the Site, the wells will be sampled within eighteen (18) months of issuance of the Certificate of Completion (COC).

**Monitoring Well Abandonment**

In addition to the installation of the monitoring wells on the DeLaval Site, the NYSDEC has requested that the City abandon one existing monitoring well near the waterfront and approximately one-hundred feet north of the DeLaval property. This well was not previously abandoned during the DeLaval remedial construction, as it was an off-site well.

The well abandonment will be completed in accordance with NYSDEC's CP-43: Groundwater Monitoring Well Decommissioning Policy. The monitoring well is an overburden well constructed with two (2)-inch diameter PVC pipe and a ten (10)-foot long section of well screen. Although the groundwater around the well exhibits minor contamination, the well seal has not been compromised and was not installed into a confining layer. Thus, the well will be grouted in place. The following paragraphs provide the specific procedures that will be followed for abandoning this well:

1. The bentonite-cement grout mixture will be placed in the well by pumping the mixture down a tremie pipe of a least one-inch inside diameter which has been placed to the bottom of the well to avoid segregation or dilution of the sealing materials. The slurry will be applied in one continuous operation until the well is filled to within at least one (1) foot of the ground surface elevation. The bottom end of the tremie pipe will be submerged in the grout during grout placement.

2. The existing concrete surface seal and protective steel casing will be removed and disposed of off-site. The PVC well riser pipe will be cut to an elevation of approximately twelve (12) inches below the existing grade.

3. The drilling contractor will allow the grout mixture to settle a minimum of two (2) hours prior to placing the bentonite seal or backfill soils on the grout. Additional grout, if necessary, should be added to the well borehole to raise the grout level to within at least one foot of the ground surface elevation.

4. A one-foot thick bentonite seal consisting of 1/4-inch diameter sodium-bentonite chips hydrated with potable water will be placed at the top of the bentonite-cement grout to provide a secondary seal.

5. The area will be restored by placing soil over the surface of the bentonite seal.

6. CHA's on-site representative will complete a well decommissioning record for submittal to NYSDEC.

**Drilling Subcontractor**

Since this project is a public works project, the drilling subcontractor personnel will be paid prevailing wages. CHA has selected Aquifer Drilling & Testing, Inc. (ADT) of Troy, New York to provide subcontracted drilling services based upon their lowest responsive bid of three (3) bidders for performing the work. CHA can provide copies of these bids under a separate cover upon request.

**Health & Safety**

All drilling and CHA personnel will have a minimum of a 40-hour initial Hazardous Waste Operations and Emergency Response (HAZWOPER) training and a current 8-hour refresher course.

A site-specific health and safety plans (HASP) has been prepared for the well installation tasks and has been included in Attachment C. All CHA personnel, including our drilling subcontractor, will review and sign the plan prior to the commencement of the drilling activities. It should be noted that this plan does not include every possible hazard and associated analyses associated with the contractor's equipment or material safety data sheets (MSDSs) for every possible product they may bring on-site in their trucks. However, our subcontractor will have their own supplemental HASP onsite that address specific hazards they must be prepared to deal with (e.g. hot work permits for welding/repairing equipment, lockout/tagout for repair/maintenance activities on the drill rig, fall protection if working on a derrick, etc.) and additional MSDS for items such as miscellaneous lubricants for maintenance of the drill rig, marking paint, etc.

**Community Air Monitoring Program**

Air monitoring will be performed at the Site during the advancement of all soil borings and decontamination activities in accordance with the New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan (CAMP),* and DER-10. All air monitoring will be conducted continuously on a real-time basis using both hand-held field instruments and perimeter air monitoring stations. All air monitoring readings will be recorded in a logbook and/or recorded by data loggers, and made available for review by both the NYSDEC and NYSDOH (including instantaneous readings from handheld instruments used for decision making purposes). The CAMP developed for the Site consists of two primary components, including fugitive dust monitoring and organic vapor monitoring as described in subsequent sections of this letter.

***Fugitive Dust Control***

Fugitive dust control measures will be implemented during all intrusive activities, including the advancement of borings to install the wells and decontamination operations. The following particulate monitoring program and fugitive dust suppression program will be implemented at the DeLaval Site during all intrusive activities:

1. Reasonable fugitive dust suppression techniques will be employed during all Site activities which may generate fugitive dust.

2. Particulate monitoring will be employed during the handling of soil/materials on Site that may generate fugitive dust. Site activities may also include the excavation, grading, or placement of clean fill.

3. Particulate monitoring will be performed using a real-time particulate monitor, specifically the TSI Incorporated DustTrak™ Aerosol Monitor, Model No. 8520, which responds to particles ranging from 0.1 to 10 microns (μm) in size and dust concentrations ranging from 0.001 to 100 mg/m$^3$. The instrument will be placed in an environmental enclosure along with the vapor monitor. A transmitter will be installed in the enclosure that will be connected to a two-way radio system. By doing so, CHA's on-Site representative overseeing the well installation will immediately be notified of any alarms.

4. Particulate levels will be monitored immediately downwind at the working Site/exclusion zone and integrated over a period not to exceed 15 minutes.

5. The action level will be established at 150 $\mu g/m^3$over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-Site air quality to assure both health and safety. If particulate levels are detected in excess of 150 $\mu g/m^3$, the upwind background level will be measured immediately using the same portable monitor. If the working Site particulate measurement is greater than 100 $\mu g/m^3$ above the background level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust and corrective action taken to protect Site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-Site personnel and implementing additional dust suppression techniques (see Paragraph 7 below). Should the action level of150 $\mu g/m^3$ be exceeded, the NYSDEC's Division of Environmental Remediation (DER) will be notified verbally at the telephone numbers provided in this SMP within two (2) hours of occurrence followed by notice in writing within five (5) working days; the notification will include a description of the control measures implemented to prevent further exceedances.

6. CHA will also rely on visual observation to monitor dust. If dust is observed leaving the working site, additional dust suppression techniques will be employed.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

    - Wetting equipment and drill cuttings.

    - Restricting vehicle speeds to ten (10) miles per hour (MPH) or less.

8. If the dust suppression techniques being utilized at the Site do not lower particulates to an acceptable level (that is, below 150 $\mu g/m^3$and no visible dust), work will be suspended until appropriate corrective measures are approved to remedy the situation.

9. CHA's on-Site representative will document calibration of the dust monitor. However, per the manufacturer's guidance, daily calibration of the dust monitor is not required. Rather, this instrument calibrated on a monthly basis by the rental supplier, and therefore, the initial calibration should be sufficient for the duration of the well installation and abandonment work.

Organic vapor monitoring will be conducted simultaneously with the dust monitoring program and is described further in the following section of the SMP.

***Organic Vapor Control***

Petroleum-contamination is known to remain at the Site following the remedial construction. Therefore, VOCs will be monitored at the downwind perimeter of the immediate work area (i.e. on a continuous basis when intrusive activities (e.g. borehole installation and decontamination) are performed. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes.

The monitoring work will be performed using MiniRAE 2000 photoionization detector (PID) with data logging capability. The PID will be calibrated at least daily using isobutylene, as recommended by the manufacturer. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below. The PID instrument will be placed in an environmental enclosure equipped with a transmitter that will immediately notify CHA's on-Site representative of any exceedances of the action levels described below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but are less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but is no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level in the downwind work area perimeter exceeds 25 ppm, the borehole will be plugged and drilling activities will be halted until a modified work plan is submitted to and approved by NYSDEC for managing elevated vapor levels.

The location of the air monitoring station will be moved to be down-gradient of each particular borehole location as well as down-gradient of the decontamination area when decontamination is being conducted. Additionally, the location will be shifted from time to time based upon changes in wind direction.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers. Should the particulate action level of 150 µg/$m^3$ or the organic vapor concentration of 25 ppm be exceeded, the NYSDEC's Division of Environmental Remediation (DER) and the NYSDOH personnel will be notified within two (2) hours of occurrence followed by notice in writing within five (5) working days; the notification will include suspected causes of the exceedances along with a description of the control measures implemented to prevent further exceedances. Additionally, the written notification will include a description of the activities on-going at the time of the exceedance and a map depicting the location of the intrusive activities and the location of the air monitoring stations.

**Reporting**

CHA will prepare a brief letter summarizing our findings following the installation of the new monitoring well network. The letter will include boring logs, well construction diagrams, well development logs, and any other observations made during the installation. Records documenting the off-site disposal of the IDW will be submitted under a separate cover following receipt of the final bill of lading/manifest.

**Project Schedule**

CHA will schedule the drilling activities within two to three weeks following receipt of an approved work plan and a signed contract from the City of Poughkeepsie. CHA anticipates that this work will be completed in five (5) to seven (7) business days following commencement. CHA's summary letter will be issued within two (2) weeks following the completion of the field work.

If you should have any questions or comments at all, or require additional information, please do not hesitate to contact me at (315) 471-3920.

Very truly yours,

Scott M. Smith, P.E.
Associate

SMS/bc

M:\14357\Rpts\MW Installation Work Plan\2010-08-16_CHA Submits MW Netowkr Work Plan to DEC.doc

**Figure 1-**

**Monitoring Well Location Map**

LEGEND

APPROXIMATE LIMITS AOCS (EXCAVATION AREA LIMITS)

MW-1 PROPOSED MONITORING WELL LOCATION

NOTE: SITE IS GENERALLY VACANT AND UNDEVELOPED AT THIS TIME. PROPOSED SITE FEATURES SHOWN FOR REFERENCE ONLY.

# HUDSON RIVER

ZONE 1 = 381± L.F.
ANCHORED BULKHEAD
(SOUTHERN 50' ZONE 1 IS REVETMENT ONLY)

ZONE 2 = 848± L.F.
RIPRAP REVETMENT

ZONE 3 = 658± L.F.
CANTILEVERED BULKHEAD

MATCHLINE FIGURE 1B

KAYAK LAUNCH
BOAT DOCK
AOC-1
AOC-2/3
MW-1
MW-2
MW-3
MW-4
MW-5
MW-8
WALKWAY
LOVE/EFFRON PROPERTY
INTERPRETIVE SPACE
ASPHALT PARKING LOT
GREEN SPACE
BUILDING 4
BUILDING 3
CB-11
CB-12
CB-13
CB-15
CB-16
CB-17
CB-18
CB-19
CB-20
CB-21
CB-22
ST
ST MH-1
ST MH-2
ST MH-3
ST MH-4
ST MH-5
RET. WALL
N/F CONRAIL CORP.
RAILROAD TRACKS
AOC-4A
AOC-5

ROUTE 9

0 100 200
Scale in feet



CLOUGH HARBOUR & ASSOCIATES LLP
441 South Salina Street - Syracuse, NY 13202-4712
Main: (315) 471-3920 · www.cloughharbour.com

MONITORING WELL LOCATION MAP

THE DeLAVAL PROPERTY
ENVIRONMENTAL RESTORATION PROGRAM PROJECT
CITY OF POUGHKEEPSIE, NEW YORK

PROJECT NO. 14357

DATE: 08/20/10

FIGURE 1A

MATCHLINE FIGURE 1A

LEGEND

- APPROXIMATE LIMITS AOCS (EXCAVATION AREA LIMITS)
- MW-1 PROPOSED MONITORING WELL LOCATION
- MON WELL ELEV=10.X MONITORING WELL TO BE ABANDONED

NOTE: SITE IS GENERALLY VACANT AND UNDEVELOPED AT THIS TIME, WITH THE EXCEPTION FO THE NORTHERN PARKING LOT AND MARINA. PROPOSED SITE FEATURES SHOWN FOR REFERENCE ONLY.

N

HUDSON RIVER

ZONE 3 = 658± L.F.
CANTILEVERED BULKHEAD

ZONE 4 = 730± L.F.
RIPRAP REVETMENT

ZONE 5 = 311± L.F.
RIPRAP REVETMENT W/ LIVE STAKE PLANTINGS

MARINA

KAAL ROCK PARK

WALKWAY

MW-6

CB-14

CB-5

CB-4

CB-6

DeLAVAL PROPERTY

RESTROOM

CB-3

CB-9

BUILDING 2

BUILDING 1

GREEN SPACE

ASPHALT PARKING LOT

MW-7

CB-7

CB-8

CB-2

CB-1

REFUSE

MW-9

MON WELL ELEV=10.X

HYD

N/F
CITY OF POUGHKEEPSIE
AKA "PUMP STATION SITE"

THE GRANDVIEW DEVELOPMENT (FORMER STP SITE)

ASPHALT DRIVEWAY

N/F
CITY OF POUGHKEEPSIE
AKA "STP SITE"

60" MAPLE

CATV BOX

GAS MARK

GAS MARK

MAINTENANCE AREA

RAILROAD TRACKS

AOC-2/3

PINE ST.

RINALDI BLVD.

0 100 200
Scale in feet



CLOUGH HARBOUR & ASSOCIATES LLP
441 South Salina Street - Syracuse, NY 13202-4712
Main: (315) 471-3920 · www.cloughharbour.com

# MONITORING WELL LOCATION MAP

THE DeLAVAL PROPERTY
ENVIRONMENTAL RESTORATION PROGRAM PROJECT
CITY OF POUGHKEEPSIE, NEW YORK

PROJECT NO. 14357

DATE: 08/20/10

FIGURE 1B

# Attachment A

# Soil Boring Log

# TEST BORING LOG

BORING NO.

PROJECT & LOCATION:

CLIENT:

CONTRACTOR:

PROJECT NO.:

SHEET NO.: 1 OF

| GROUNDWATER MEASUREMENT | | | | | | CASING | SAMPLER | CORE BARREL |
|---|---|---|---|---|---|---|---|---|
| DATE | TIME | DEPTH TO (FT.): WATER | BOTTOM OF CASING | BOTTOM OF BORING | TYPE: | | | |
| | | | | | SIZE I.D.: | | | |
| | | | | | HAMMER WT.: | | | |
| | | | | | HAMMER FALL: | | | |
| | | | | | DRILL FLUID: | DEPTH INTRODUCED: | | |
| | | | | | CHECKED BY: | | | |
| | | | | | DATE: | | | |

ELEVATION:

START DATE: TIME:

FINISH DATE: TIME:

RIG TYPE:

DRILLER:

INSPECTOR:

IF BORING IS DRY, CHECK HERE: ☐

| DEPTH IN FEET | SAMPLE NO. | RECOVERY LENGTH | SPT BLOWS PER 6" | N/RQD | NOTES | FIELD CLASSIFICATION |
|---|---|---|---|---|---|---|
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |

| BLOWS/FT. | DENSITY |
|---|---|
| 0-4 | - VERY LOOSE |
| 5-10 | - LOOSE |
| 11-30 | - MEDIUM COMPACT |
| 31-50 | - COMPACT |
| 51+ | - VERY COMPACT |

| BLOWS/FT. | CONSISTENCY |
|---|---|
| 0-2 | - VERY SOFT |
| 3-4 | - SOFT |
| 5-8 | - MEDIUM STIFF |
| 9-15 | - STIFF |
| 16-30 | - VERY STIFF |
| 50+ | - HARD |

| SAMPLE IDENTIFICATION |
|---|
| S – SPLIT SPOON |
| T – THIN WALL TUBE |
| A – AUGER CUTTINGS |
| W – WASH SAMPLE |

BORING NO.

# TEST BORING LOG

BORING NO.

PROJECT & LOCATION:

CLIENT:

PROJECT NO.:

CONTRACTOR:

SHEET NO.: OF

| DEPTH IN FEET | SAMPLE NO. | RECOVERY LENGTH | SPT BLOWS PER 6" | N/RQD | NOTES | FIELD CLASSIFICATION |
|---|---|---|---|---|---|---|
| | | | | | | |

| BLOWS/FT. | DENSITY |
|---|---|
| 0-4 | - VERY LOOSE |
| 5-10 | - LOOSE |
| 11-30 | - MEDIUM COMPACT |
| 31-50 | - COMPACT |
| 50+ | - VERY COMPACT |

| BLOWS/FT. | CONSISTENCY |
|---|---|
| 0-2 | - VERY SOFT |
| 3-4 | - SOFT |
| 5-8 | - MEDIUM STIFF |
| 9-15 | - STIFF |
| 16-30 | - VERY STIFF |
| 50+ | - HARD |

| SAMPLE IDENTIFICATION |
|---|
| S – SPLIT SPOON |
| T – THIN WALL TUBE |
| A – AUGER CUTTINGS |
| W – WASH SAMPLE |

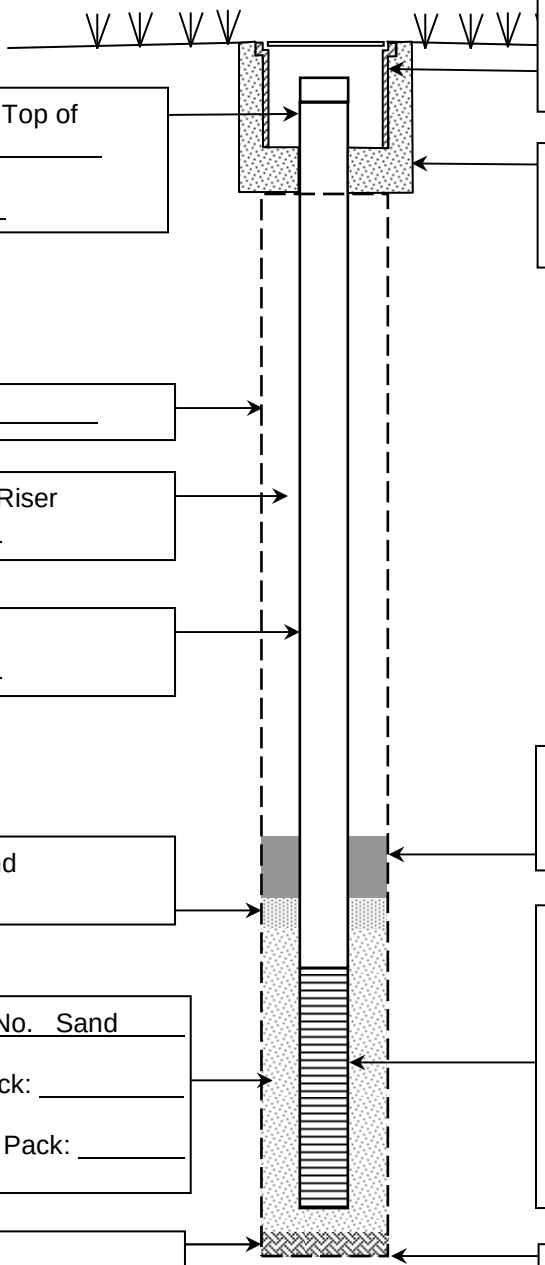
BORING NO.

**Attachment B**

**Well Construction Log**

# WELL CONSTRUCTION LOG

| | |
|---|---|
| PROJECT & LOCATION: | BORING NO. / WELL NO. |
| CLIENT: | PROJECT NO.: |
| CONTRACTOR: | SHEET NO.: 1 OF 1 |
| | ELEVATION: |
| | START DATE: TIME: |
| | FINISH DATE: TIME: |
| | DRILLER: |
| | INSPECTOR: |



Type of Protective Casing: _____
Inside Dia. Of Casing: _____

Depth Below Ground of Casing: _____

Depth Below Ground to Top of Riser Pipe: _____

Type of Cap:_____

Type of Surface Seal: Concrete

Thickness of Surface Seal:_____

Diameter Borehole: _____

Type of Backfill Around Riser Pipe: _____

Inside Diameter of Riser Pipe: _____

Type of Bentonite Seal: _____
Depth to Top of Bentonite Seal:_____

Depth to Top of Fine Sand Choke: _____

Type of Screen: _____

Screen Diameter: _____

Screen Slot Size: _____

Depth to Top of Screen: _____

Depth to Bottom of Screen: _____

Type of Sand Pack: No. Sand

Depth to Top of Sand Pack: _____

Depth to Bottom of Sand Pack: _____

Backfill (if any): _____

Depth to Bottom of Borehole: _____

# Attachment C

# Estimated Well Construction Information

Attachment C
Estimated Well Construction Information

| Well No. | Proposed Elevation | Existing Elevation | Anticipated Ave. High Tide | Anticipated Top of Screen Elev. | Anticipated Bottom of Screen Elev | Anticipated Borehole Depth (ft.) | Top Sandpack Elev. | Height of Sandpack Above Screen | Top of Bentonite Seal | Thickness Bent Seal | Bottom Concrete Surface Seal | Thickness Concrete Surface Seal | Temporary Concrete Penetration into Ground (ft.) | Temporary Concrete Stickup (ft.) | Depth Bentonite Seal to Bottom Concrete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 6 | 5 | 1 | 2.5 | -7.5 | 12.5 | 3 | 0.5 | 4.5 | 1.5 | 4.5 | 1.5 | 0.5 | 1 | 0 |
| MW-2 | 6 | 5 | 1 | 2.5 | -7.5 | 12.5 | 3 | 0.5 | 4.5 | 1.5 | 4.5 | 1.5 | 0.5 | 1 | 0 |
| MW-3 | 7.1 | 6.8 | 1.5 | 3.5 | -6.5 | 13.3 | 4 | 0.5 | 5.5 | 1.5 | 5.5 | 1.6 | 1.3 | 0.3 | 0 |
| MW-4 | 11.6 | 11.6 | 2 | 4 | -6 | 17.6 | 5.5 | 1.5 | 7.5 | 2 | 10.5 | 1.1 | 1.1 | 0 | 3 |
| MW-5 | 6 | 5 | 1 | 2.5 | -7.5 | 12.5 | 3 | 0.5 | 4.5 | 1.5 | 4.5 | 1.5 | 0.5 | 1 | 0 |
| MW-6 | 6 | 5 | 1 | 2.5 | -7.5 | 12.5 | 3 | 0.5 | 4.5 | 1.5 | 4.5 | 1.5 | 0.5 | 1 | 0 |
| MW-7 | 10.7 | 7 | 1.5 | 3.5 | -6.5 | 13.5 | 4 | 0.5 | 5.7 | 1.7 | 5.7 | 5 | 1.3 | 3.7 | 0 |
| MW-8 | 11.6 | 11.2 | 2 | 4 | -6 | 17.2 | 5.5 | 1.5 | 7.5 | 2 | 10 | 1.6 | 1.2 | 0.4 | 2.5 |
| MW-9 | 11.5 | 11 | 2 | 4 | -6 | 17 | 5.5 | 1.5 | 7.5 | 2 | 10 | 1.5 | 1 | 0.5 | 2.5 |

**Attachment D**

**Health & Safety Plan**

# Health & Safety Plan
# Monitoring Well Installation

## The DeLaval Property
## 202-204 Rinaldi Boulevard
## City of Poughkeepsie,
## Dutchess County, New York
## ERP Site No. B00190-3

*CHA Project Number: 14357.1020.1102*


***Prepared for:***

***City of Poughkeepsie***
*62 Civic Center Plaza*
*P.O. Box 300*
*Poughkeepsie, New York 12602-0300*

***Prepared by:***

*441 South Salina Street*
*Syracuse, New York 13202*
*Phone: (315) 471-3920*
*Fax: (315) 471-3569*

***August 20, 2010***

**Revisions to this Health & Safety Plan:**

| Revision No. | Submitted Date | Summary of Revision | DEC Approval Date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# DISCLAIMER

This Site Health & Safety Plan (HASP) has been written for the use of Clough Harbour & Associates LLP (CHA) and their employees. Properly trained and experienced CHA subcontractors may also use it as a guideline document. However, CHA does not guarantee the health and safety of any person entering the Site.

Due to the potentially hazardous nature of the project and the activity occurring thereon, it is not possible to discover, evaluate and provide protection for all possible hazards, which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at the project. The health and safety guidelines in this plan were prepared specifically for this project and should not be used on any other project without prior research by trained health and safety specialists.

CHA claims no responsibility for the use of this Plan by others. The Plan is written for the specific Site conditions; purpose, dates, and personnel specified and must be amended if these conditions change.

# TABLE OF CONTENTS

DISCLAIMER ..... II

TABLE OF CONTENTS ..... III

LIST OF TABLES ..... V

LIST OF FIGURES ..... V

LIST OF APPENDICES ..... V

LIST OF ACRONYMS & ABBREVIATIONS ..... VI

1.0 INTRODUCTION & DESCRIPTION OF REMEDIAL PROGRAM ..... 1

2.0 GENERAL SITE INFORMATION ..... 2

3.0 EMERGENCY CONTACTS ..... 3

4.0 KEY PERSONNEL ..... 5

- 4.1 Off-Site Personnel ..... 5
- 4.2 On-Site Personnel ..... 5
- 4.3 As-Needed Personnel ..... 6

5.0 SITE ENTRY ..... 7

- 5.1 Objectives ..... 7
- 5.2 Safety Meetings ..... 7
- 5.3 Safety Training ..... 7
- 5.4 Medical Surveillance ..... 7
- 5.5 Site Mapping ..... 8

6.0 SITE CHARACTERIZATION ..... 9

- 6.1 Site Description ..... 9
- 6.2 Site History ..... 9
- 6.3 Neighboring Properties ..... 12
- 6.4 Site Topography ..... 12
- 6.5 Meteorological Data ..... 12

7.0 HAZARD EVALUATION ..... 13

- 7.1 Physical Hazards ..... 13
- 7.2 Biological Hazards ..... 13
- 7.3 Chemical Hazards ..... 13
- 7.4 Flammable Hazards ..... 16
- 7.5 Hazard Identification & Control ..... 16

8.0 AIR MONITORING & ACTION LEVELS ..... 19
8.1 Air Monitoring Equipment ..... 19
8.2 Action Levels ..... 19
8.3 Community Air Monitoring Requirements ..... 20
8.4 Environmental Sampling ..... 21
9.0 PERSONAL PROTECTIVE EQUIPMENT ..... 22
9.1 GEneral Information ..... 22
9.2 Task Specific Requirements ..... 23
10.0 SITE CONTROL MEASURES ..... 25
10.1 Work Zones ..... 25
10.2 Communication ..... 25
10.3 Site Security Measures ..... 26
11.0 DECONTAMINATION ..... 27
11.1 Personal Protective Equipment ..... 27
11.2 Small Equipment & Hand Tools ..... 27
11.3 Heavy Equipment ..... 27
12.0 HAZARD COMMUNICATION ..... 28
13.0 CONFINED SPACE ..... 29
14.0 EMERGENCY PROCEDURES ..... 30
14.1 Personnel Injury ..... 31
14.2 Fire/Explosion ..... 31
14.3 PPE Failure ..... 31
14.4 Chemical Exposure ..... 31
14.5 Spill Containment ..... 32
15.0 EMERGENCY MEDICAL CARE ..... 33
15.1 Nearest Hospital ..... 33
15.2 On-Site First Aid ..... 33
15.3 Heat & Cold Stress ..... 34
15.3.1 Heat Stress ..... 34
15.3.2 Cold Stress ..... 35
16.0 STANDARD OPERATING PROCEDURES ..... 37
17.0 CERTIFICATION & AGREEMENT ..... 39

## LIST OF TABLES

Table 7-1. Exposure Limit Summary ..... 14
Table 7-2. Hazard Evaluation ..... 17

## LIST OF FIGURES

Figure 1. Vicinity Location Map

## LIST OF APPENDICES

Appendix A HAZWOPER Certifications
Appendix B Analytical Summary Tables
Appendix C Material Safety Data Sheets

# LIST OF ACRONYMS & ABBREVIATIONS

| | |
|---|---|
| AMSL | Above Mean Sea Level |
| AOC | Area of Concern |
| CAMP | Community Air Monitoring Program |
| CFR | Code of Federal Regulations |
| CHA | Clough Harbour & Associates LLP |
| ERP | Environmental Restoration Program |
| ESA | Environmental Site Assessment |
| HASP | Health and Safety Plan |
| HAZWOPER | Hazardous Waste Operations & Emergency Response |
| HSC | Health & Safety Coordinator |
| IDLH | Immediately Dangerous to Life and Health |
| MOSF | Major Oil Storage Facility |
| MSDS | Material Safety Data Sheet |
| MSHA | Mine Safety and Health Administration |
| MTA | Metropolitan Transportation Authority (of New York City) |
| NIOSH | National Institute for Occupational Safety and Health |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health |
| OSHA | Occupational Safety and Health Administration |
| PAH | Polynuclear Aromatic Hydrocarbon |
| PCB | Polychlorinated Biphenyl |
| PEL | Permissible Exposure Level |
| PID | Photoionization Detector |
| PPE | Personal Protective Equipment |
| PPM | Parts per Million |
| REL | Recommended Exposure Limit |
| RI | Remedial Investigation |
| SCBA | Self-Contained Breathing Apparatus |
| SHSO | Site Health & Safety Officer |
| STP | Sewage Treatment Plant |
| SVOC | Semivolatile Organic Compound |
| TCC | The Chazen Companies |
| TWA | Time Weighted Average |
| USEPA | United States Environmental Protection Agency |
| VOC | Volatile Organic Chemical |

# 1.0 INTRODUCTION & DESCRIPTION OF REMEDIAL PROGRAM

The following Health and Safety Plan (HASP) has been created for the protection of Clough Harbour & Associates LLP (CHA) staff on the Hudson River Waterfront - DeLaval Property, located 202-204 Rinaldi Boulevard, Poughkeepsie, New York, 12601 (see Figure 1). This project's various assignments require CHA employees to perform tasks where personal safety could be compromised due to chemical, physical, and biological hazards. While conducting fieldwork, CHA employees may be exposed to chemical contaminants including a wide variety of organic compounds and heavy metals. Additionally, CHA employees may be exposed to physical hazards, including but not limited to, heavy machinery, subsurface utilities, and trip/fall hazards. CHA employees may also be exposed to biological hazards, including but not limited to insects, poison ivy/oak/sumac, and animals.

The requirements and guidelines in this HASP are based on a review of information collected to date and an evaluation of potential on-Site hazards identified from this information. The plan procedures will be updated as any new or previously unknown information becomes available with regard to the actual Site conditions.

This HASP will be discussed with Site personnel and will be available on-Site for review while work is underway. All personnel conducting site activities must be familiar with the procedures, requirements and provision of this plan, and in the event of conflicting plans/requirements, personnel must implement those safety practices which afford the highest level of protection. CHA personnel will report to the CHA Health and Safety Coordinator (HSC) in matters of health and safety. While the HSC is responsible for ensuring compliance with this HASP and stopping work when necessary, the Field Team Leader is responsible for implementation of this HASP into daily site activities.

Non-intrusive activities within CHA's Scope of work are those that do NOT have the potential to jeopardize the health and safety of site workers, the public, or the environment with respect to Site contaminants. Intrusive activities within CHA's Scope of work are those that have the potential to cause health and safety concerns to site workers, the public, or the environment. All on-Site activities, intrusive or otherwise, require training per 29 CFR 1910.120 *Hazardous Waste Operations and Emergency Response, Final Rule*, which govern work on hazardous waste sites.

## 2.0 GENERAL SITE INFORMATION

| | |
|---|---|
| CHA Project Number: | 14357.1020.1102 |
| Client | City of Poughkeepsie |
| Client Contact: | Mr. Joseph Chenier – (845) 451-4074 |
| Site Name: | Hudson River Waterfront - DeLaval Property |
| Site Address: | 202-204 Rinaldi Boulevard<br>Poughkeepsie, New York 12601 |
| Site Size: | 13.95± acres |
| Site Status: | Site remediation is on-going under the New York State Department of Environmental Conservation's (NYSDEC's) Environmental Restoration Program (ERP). All elements of the remedy have been implemented with the exception of the final soil cover system. Elevated heavy metal concentrations are known to be present in the surface soils at the Site and there is also known remaining petroleum contamination impacting the subsurface soil and groundwater beneath the Ste. |
| Work Tasks/Duration: | -New Monitoring Well Installation: Approximately 5 days<br>-Monitoring Well Abandonment: Approximately 1 day |
| Subcontractor(s): | A drilling subcontractor will be employed to advance the proposed soil borings, install and develop the new monitoring wells, and to abandon one existing well. The drilling subcontractor for this project will be:<br><br>Aquifer Drilling & Testing, Inc.<br>9 Monroe Street<br>Troy, New York 12180<br>Phone: (518) 274-3949 |

## 3.0 EMERGENCY CONTACTS

| | |
|---|---|
| Ambulance: | **911** |
| Police Department: | **911** |
| Fire Department: | **911** |
| Hazardous Materials Response: | **911** |
| City of Poughkeepsie Police: | (845)-451-4000 |
| NYS Police – Troop K: | (845) 677-7300 |
| NYSDEC Spills Hotline: | 1-800-457-7362 (24 hours a day) |
| USEPA Region 2: | (212) 637-3360 |
| Spill/Cleanup Contractor:<br>(EPS of Vermont) | (518) 465-4000<br>1-800-5-Spills (Toll Free) |
| Poison Control: | 1-800-222-1222 |
| Utility Clearance: | 1-800-DIG-SAFE (1-800-344-7233) |
| CHA Contact: | Scott M. Smith, P.E.<br>(315) 471-3920 – Office<br>(315) 427-1033 – Cell |
| Client Contact: | Mr. Joseph Chenier<br>(845) 451-4074 |
| NYSDEC Project Manager: | Mr. Joshua Cook, P.E.<br>(518) 402-9662 |
| Nearest Hospital: | Vassar Brothers Medical Center<br>45 Reade Place<br>Poughkeepsie, New York 12601<br>Phone: (845) 454-8500 |

Directions to the Hospital: (see below for a map of directions to hospital)

1. Drive east on Pine Street, going under railroad overpass.
2. Turn right onto Pine Street Spur.
3. Turn left onto Columbia Street.
4. Cross over Route 9 and turn right onto Young Street
5. Turn right onto Reade Place
6. Hospital on left. Follow signs to Emergency entrance.

Total Estimated Distance: 0.5 miles
Total Estimated Time: 2 minutes


Source: Google Maps – City of Poughkeepsie, NY, 2009.

# 4.0 KEY PERSONNEL

## 4.1 OFF-SITE PERSONNEL

| | |
|---|---|
| Title: | **Senior Level Management** |
| Description: | Responsible for defining project objectives, allocating resources, determining the chain of command, and evaluating program outcome. |
| Contact: | Scott M. Smith, P.E. @ (315) 471-3920 |

| | |
|---|---|
| Title: | **Project Team Leader** |
| Description: | Reports to upper level management, has authority to direct response operations, assumes total control over Site activities. |
| Contact: | Scott M. Smith, P.E. @ (315) 471-3920 |

| | |
|---|---|
| Title: | **Scientific Advisor** |
| Description: | Guides the Project Team Leader in scientific matters. |
| Contact: | Christopher A. Burns, Ph.D., P.G. @ (315) 322-1567 |

| | |
|---|---|
| Title: | **CHA Company Health & Safety Coordinator (HSC)** |
| Description: | Overall responsibility for implementing company-wide health and safety standards, procuring appropriate personal protective clothing and equipment, staff training, etc. |
| Contact: | Margaret M. Rudzinski @ (518) 453-2830 |

## 4.2 ON-SITE PERSONNEL

| | |
|---|---|
| Title: | **Site Health & Safety Officer (SHSO)** |
| Description: | Advises the field team on all aspects of health and safety issues, recommends stopping work if any operation threatens worker or public health and safety. |
| Contact: | TBD @ (518) xxx-xxxx |

| | |
|---|---|
| Title: | **Field Team Leader** |
| Description: | Responsible for field team operations. |
| Contact: | TBD @ (518) xxx-xxxx |

| | |
|---|---|
| Title: | **Work Party** |
| Description: | Performs field operations |
| Contact: | TBD @ (518) xxx-xxxx |

## 4.3 AS-NEEDED PERSONNEL

| | |
|---|---|
| Title: | Fire Department |
| Description: | Responds to fires, performs rescues, and maintains hazardous material responders. |
| Contact: | 911 |

| | |
|---|---|
| Title: | Hazardous Chemical Cleanup Contractor |
| Description: | Contaminant control methods and emergency response. |
| Contact: | Environmental Products & Services of Vermont, Inc.<br>Jeff Colletta @ (518) 465-4000 |

# 5.0 SITE ENTRY

## 5.1 OBJECTIVES

The objectives of the Site entry are to install nine (9) monitoring wells at the Site that will be used as part of the post-remediation monitoring system as well as abandon one (1) existing monitoring well. Based upon the investigations and remedial activities performed at the Site to date, contamination is known to remain in the soils and groundwater at the Site. This plan was developed due the potential that personnel installing/abandoning the monitoring wells will come into contact with contaminated soil and/or groundwater.

## 5.2 SAFETY MEETINGS

To ensure that the HASP is being followed, the task Site Health & Safety Officer (SHSO) shall conduct a safety meeting prior to entry to the Site or the initiation of any Site activity, if any conditions change, and before each work day.

## 5.3 SAFETY TRAINING

The task SHSO will confirm that every person assigned to a task has had adequate training for that task and that the training is up-to-date by checking with the CHA Health & Safety Coordinator. On-Site CHA staff working on this project shall have a minimum of a 40-hour initial Hazardous Waste Operations and Emergency Response (HAZWOPER) training and a current 8-hour refresher course. Additionally, CHA will confirm that all subcontractor's on-Site personnel have the HAZWOPER training and a current 8-hour refresher course. Certificates will be included in Appendix A of this HASP prior to the commencement of intrusive activities.

All training will have been conducted and certified in accordance with the Occupational Safety and Health Administration (OSHA) regulations as outlined in 29 CFR 1910.120.

## 5.4 MEDICAL SURVEILLANCE

All on-Site CHA personnel (including CHA subcontractors) will have had a medical surveillance physical consistent with OSHA regulations in 29 CFR 1910.120 and performed by a qualified occupational health physician. The SHSO shall confirm prior to initiation of work on this Site that

every person assigned to a task has had an annual physical, has passed the medical examination and has been determined medically fit by the occupational health physician for this type of work.

## 5.5 SITE MAPPING

A map depicting the proposed locations of the new monitoring wells to be installed as well as the well scheduled for abandonment has been provided as Figure 2 in the Post-Remedial Monitoring Well Network Installation Work Plan, in which this HASP is attached to.

# 6.0 SITE CHARACTERIZATION

## 6.1 SITE DESCRIPTION

The Site is approximately 13.95-acres in size and is located in the City of Poughkeepsie, County of Dutchess, New York. The Site is currently a vacant parcel of land located immediately adjacent to the Hudson River. The Site was historically used for industrial operations from the late 1800s through the 1960s. The property remained vacant until 2008, at which time remediation of the Site began. While a final soil cover system has not been placed across the Site surface to isolate the remaining contamination for human and environmental exposure, most of the remedial construction is complete. The monitoring well installation work covered under this HASP will be part of the future monitoring of the Site.

## 6.2 SITE HISTORY

The following summary of the Site history was prepared based upon review of available Sanborn Mapping, historical railroad mapping provided by the Metropolitan Transportation Authority (MTA) of New York City, and review of historical documents on DeLaval, Inc.'s website (http://www.delaval-us.com):

**1887 Sanborn Map:** Development of the Site had already commenced and it was occupied by a tannery, carpentry shop, two coal sheds, and a pair of homes at that time. Much of the current Site was underwater and part of the Hudson River at that time, particularly towards the southern end of the Site. Rinaldi Boulevard was known as South Water Street at that time.

**1890 – DeLaval Website:** According to DeLaval's website, they began operations in Poughkeepsie, New York in 1890.

**1895 Sanborn Map:** The approximately northern half of the Site was occupied by E.B. Taylor. E.B. Taylor had several structures on the Site that were utilized for the storage of umber, lime, cement and coal. There was also one coal shed occupied by J.G. Martin and two coal sheds occupied by A. Doughty's located at the north end of the Site (north of the intersection between Pine Street and Rinaldi Boulevard). In addition, there was a small office building, a "hides" structure associated with the former tannery, and a hay storage shed located near the northern boundary of the Site. Approximately 250 north of the existing tunnel beneath the MTA railroad tracks and adjacent to the railroad tracks, there was a "switchman's tower."

Moving southward, there were three structures present that appeared to be associated with The DeLaval Separator Company, which was identified as a manufacturer of cream separators used in the

dairy industry. The northernmost structure was labeled as "packaging, assembly and shipping" and was located east of the existing tunnel beneath the MTA railroad tracks. Further south was another structure labeled "Iron Works & Offices." A coal-fired power/steam plant with two engines was situated between the main two structures and immediately adjacent to the MTA tracks. Additionally, one small ice house was present east of the iron works and offices building and additional ice houses were located at the south end of the Site.

**1907 Railroad Map:** This map indicated that the northern half of the Site was still occupied by lumber sheds, store houses, and a barn. The DeLaval Separator Company had expanded, adding a store house between the shipping building and the railroad tracks, and a paint shop between the iron works building and the railroad tracks. A rail spur running northward across most of the length of the DeLaval Site from the south end was present at that time and was labeled as being operated by the "Standard Oil Company." The southern end of the DeLaval property was occupied by the Poughkeepsie Yacht Club.

**1913 Sanborn Map:** The DeLaval Separator Company had expanded its operations significantly, and occupied most of the Site. In fact, based upon the map, it appeared that DeLaval had constructed bulkheads along the riverfront and had encroached further westward upon the Hudson River. The DeLaval Separator Company manufactured milking machines, centrifuges to separate milk and cream, and other stainless steel farming equipment by this timeframe.

The railroad spur near the center of the Site split into two spurs near the north end of the Site and extended to near the intersection of South Water Street (Rinaldi Boulevard) and Pine Street. Structures located between the railroad spur and the Hudson River included a pressed steel room, a pickling room, a tinning room, an annealing room, a relatively large engine and dyno room (an "independent electric plant") with what appears to possible by three horizontal oil storage tanks, a large smoke stack, a clarifying room, a bowl department, a tool room, and inspecting room, a finished stock room, an assembly room, a machine shop, castings storage, metal storage, and a scrap metal building.

An acetylene gas house, house/fire house, a forge shop, storage buildings, a packing/shipping/box building room, offices (including drafting areas and a blueprint room), a bicycle room, and an oil storage structured were present between the railroad spur and the existing railroad tracks along the east side of the Site. The oil storage structured was located approximately 450 feet south of the tunnel going beneath the MTA railroad tracks.

While the coal sheds at the north end of the Site (north of the Site entrance) changed little, these structures were now owned by DeLaval Separator Company was well. DeLaval also owned structures northeast of the intersection of Pine Street and Rinaldi Boulevard and east of the railroad tracks. A large dwelling was visible on top of the rock outcropping present near the northeast corner of the Site.

The south end of the DeLaval Site was undeveloped and much of it was still under water as part of the Hudson River. However, the far south end of the Site was labeled as the "DeLaval Separator Co. Storage Yard."

The surrounding areas remained relatively unchanged; however, a total of six sets of tracks were visible along the east side of the Site.

**1917 Railroad Map:** The map indicates that the Site was occupied by several structures and the Site was labeled as the DeLaval Separator Company. The map shows the presence of the rail spur on the Site and the presence of a gasoline tank located immediately west of the spur, approximately 200 feet north of the southern Site boundary. There are no other visible structures shown at the south end of the Site, so the purpose of this tank is unclear. The parcel of land north of the DeLaval Site was labeled Moline Plow Company.

**1913 to 1950 Sanborn Maps:** The Site continued to be controlled by the DeLaval Separator Company as well as the former D.H. Burrell & Co. and the Lane Bros. Co. foundries located east of the railroad tracks and west of Prospect Street (now partially occupied by US Route 9 corridor). However, the eastern expansion beyond the railroad tracks is not part of the Site.

One of the coal storage sheds located near the entrance to the Site had been removed and replaced with an "auto parking" area. Towards the south end of the Site, the machine shop had been significantly expanded. A note indicates this addition was constructed in 1918. Additionally, a steam shop had been added to the southern end of the oil storage structure adjacent to the railroad retaining wall and an "oil research laboratory" was located approximately 750 feet south of the tunnel beneath the railroad tracks.

**1952 Sanborn Map:** The map revealed the presence of two underground storage tanks and oil storage building which are suspected to have contributed to the Site contamination.

A review of historical aerial photography was completed by The Chazen Companies (TCC) during December 1999, as part of a Phase I Environmental Site Assessment (ESA). While a 1962 aerial photograph of the Site indicated that most of the Site was still occupied by the DeLaval Separator Company structures, a 1967 aerial photograph revealed that the DeLaval Site was vacant and largely un-vegetated, with the exception of one small structure (e.g. a shed) which was not visible in the 1970 aerial photograph. Some vegetation was visible on the Site by the 1980 aerial photograph. A 1995 aerial photograph as well as Site assessment work that began in 1999 indicates that the Site remained vacant between the 1960s and 2007.

According to the title search performed by TCC at the Dutchess County Real Property Tax Office, the DeLaval Separator Company sold the Site to the Robert H. Corbetta Corporation in December of 1965, who in turn sold the land to the City of Poughkeepsie in 1968.

The specific waste disposal practices related to the aforementioned operations on the Site are not definitively known. However, Site investigations have revealed a landfill area on the southern portion of the property. This area is also located in the area that was historically identified as a DeLaval storage area between 1913 and 1950.

## 6.3 NEIGHBORING PROPERTIES

The Site is bounded by the Shadows on the Hudson restaurant/catering facility and The Grandview banquet facility (formerly the City Sewage Treatment Plant (STP) site) to the north, Love/Effron, a major oil storage facility (MOSF) to the south, a Metropolitan Transportation Authority (MTA) of New York City-owned concrete wall with an elevated railroad corridor utilized by Metro North, Amtrak and Conrail to the east, and the Hudson River to the west.

## 6.4 SITE TOPOGRAPHY

Based upon a survey map provided for the area, elevations in the vicinity of the project range from approximately 5 to 18 feet above mean sea level (AMSL). The project area is relatively flat and generally slopes westward towards the Hudson River.

## 6.5 METEOROLOGICAL DATA

The fieldwork for the proposed investigation will be completed in late summer to early fall. Therefore, temperatures are expected to range from approximately 50 degrees Fahrenheit to 90 degrees Fahrenheit on average. However, the weather and temperature throughout the year will vary from hot and humid in the summer months to cold and dry in the winter months. Prior to each day's activities, the daily forecast will be monitored for indications of adverse work conditions. If poor weather hinders the continuation of the day's activities or poses unsafe work conditions, the Field Team Leader may stop work for the day.

# 7.0 HAZARD EVALUATION

## 7.1 PHYSICAL HAZARDS

Physical hazards such as the following may be encountered on Site:

- Slip/Trip/Fall (e.g. from animal burrows, debris, steep topography, ice, etc.)
- Ultraviolet rays
- Lifting strains (e.g. from generators, drums, equipment)
- Heavy machinery and vehicles (e.g. drill rigs)
- Flying debris (e.g. debris from drilling equipment)
- Noise (e.g. elevated noise levels associated with drilling equipment)
- Heat/cold stress

## 7.2 BIOLOGICAL HAZARDS

Biological hazards such as the following may be encountered on Site:

- Poisonous plants – poison ivy, poison oak, poison sumac
- Insects/animals – deer ticks, mosquitoes, rabid animals, snakes, stray animals

## 7.3 CHEMICAL HAZARDS

Based upon analytical data available for the Site to date, the following primary categories of contaminations are known to exist at the Site:

- Volatile Organic Compounds (VOCs), particularly chlorinated solvents
- Semivolatile Organic Compounds (SVOCs), namely polynuclear aromatic hydrocarbons (PAHs)
- Polychlorinated Biphenyls (PCBs)
- Metals

.

OSHA Permissible Exposure Levels (PELs) and the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits-time weighted average (REL-TWA) concentrations are provided in the following table for contaminants detected at the Site:

**Table 7-1. Exposure Limit Summary**

| Chemical | OSHA PEL-TWA ($mg/m^3$ or ppm) | NIOSH REL-TWA ($mg/m^3$ or ppm) |
|---|---|---|
| Acetone | 1,000 | 250 |
| Benzene | 1 | 0.1 |
| sec-Butylbenzene | -- | -- |
| Carbon Disulfide | 20 | 1 |
| Chlorobenzene | 75 | 75 |
| cis-1,2-Dichloroethene | 200 | 200 |
| Ethylbenzene | 100 | 100 |
| Methylene Chloride | 25 | -- |
| Toluene | 200 | 100 |
| Tetrachloroethene | 100 | -- |
| Trichloroethene | 100 | 25 |
| Xylene | 100 | 100 |
| Acenaphthylene | -- | -- |
| Acenaphthene | -- | -- |
| Anthracene | 0.2 | 0.1 |
| Benzo(a)anthracene | -- | -- |
| Benzo(a)pyrene | 0.2 | 0.1 |
| Benzo(b)fluoranthene | -- | -- |
| Benzo(g,h,i)perylene | -- | -- |
| Benzo(k)fluoranthene | -- | -- |
| Bis(2-Ethylhexyl)phthalate | -- | -- |
| Carbazole | -- | -- |
| Chrysene | 0.2 | 0.1 |
| Dibenz(a,h)anthracene | -- | -- |
| Dibenzofuran | -- | -- |
| Fluoranthene | -- | -- |
| Fluorene | -- | -- |
| Indeno(1,2,3-cd)pyrene | -- | -- |
| 2-Methylnapthalene | -- | -- |
| Naphthalene | 10 | 10 |
| Phenanthrene | 0.2 | 0.1 |
| Pyrene | 0.2 | 0.1 |
| PCBs | 0.5 | 0.001 |
| 4,4'-DDT | 1 | 0.5 |
| Aluminum | 15 | 10 |
| Antimony | 0.5 | 0.5 |
| Arsenic | 0.01 | -- |
| Barium | -- | -- |
| Beryllium | 0.002 | 0.0005 |
| Cadmium | 0.005 | -- |

| Chemical | OSHA PEL-TWA ($mg/m^3$ or ppm) | NIOSH REL-TWA ($mg/m^3$ or ppm) |
|---|---|---|
| Calcium | -- | -- |
| Chromium | 0.5 | 0.5 |
| Cobalt | 0.1 | 0.05 |
| Copper | 1 | 1 |
| Iron | 10 | 5 |
| Lead | 0.05 | 0.05 |
| Magnesium | -- | -- |
| Manganese | 5 | 1 |
| Mercury | 0.1 | 0.05 |
| Nickel | 1 | 0.015 |
| Potassium | -- | -- |
| Selenium | 0.2 | 0.2 |
| Silver | 0.01 | 0.01 |
| Sodium | -- | -- |
| Thallium | 0.1 | 0.1 |
| Vanadium | 0.05 | 0.05 |
| Zinc | -- | -- |
| Asbestos | 0.1 fiber/$cm^3$ | 0.1 fiber/$cm^3$ |

Analytical data from CHA's Supplemental Investigation Summary Report data January 2005 as well as the analytical data from confirmatory samples collected following the excavation and off-site disposal of several thousand tons of petroleum-contaminated soils has been summarized in tabular format in Appendix X. It should be noted that the data from the investigative report may not be representative of current conditions given the recent remedial action activities. Additionally, the confirmatory samples were collected in areas where the soil removal took place and in close proximity to the location of the proposed new monitoring wells, but this data only provides coverage for source removal areas.

The potential exposure mechanism that can transport particulates and contaminants from the project area to other areas of the facility as well as beyond the boundaries of the facility are:

- Failure to adhere to proper decontamination procedures
- Failure to properly managed water generated from decontamination processes
- Contact with groundwater

- Contaminated dust projected by air currents (although will be minimal giving the limited area of disturbance resulting from the drilling of the boreholes).

## 7.4 FLAMMABLE HAZARDS

As a precautionary measure the following will be implemented to address flammable hazards.

- Use a fire extinguisher only to escape or to fight very small fires. Do not attempt to fight large fires.
- Field vehicles must have at least one ABC rated fire extinguisher.
- Explosive or flammable materials and liquids will be stored only in approved facilities.
- Smoking is not permitted on the Site within any work areas involving intrusive activities.
- All food and drink (including items such as chewing gum, chewing tobacco, etc.) will be prohibited in the exclusion zones or contamination-reduction zones at the Site.
- Hot work (i.e.: cutting, grinding, welding, torching) shall not be allowed in the work area(s) unless a comprehensive Hot Work Permit is completed and authorized.

## 7.5 HAZARD IDENTIFICATION & CONTROL

Hazard controls generally consist of the following specific safety procedures: training, engineering controls, air monitoring and personal protective equipment (PPE) selection. CHA employees are required to use the PPE appropriate to their work task and potential exposures as outlined in the HASP. The levels of PPE assigned to each activity are based on available information on the estimation of exposure potential associated with each work task. For the installation/abandonment of monitoring wells, the following hazards and controls have been identified.

**Table 7-2. Hazard Evaluation.**

| HAZARDS | HAZARD CONTROL/PRECAUTION |
|---|---|
| Potential Chemical exposure to volatile, semi-volatile, heavy metals, PAHs. | Exposure to chemical hazards:<br>- All on-Site personnel will be properly trained in accordance with 29 CFR 1910.120<br>- Conduct air monitoring throughout the investigation (See Section 9.2 for action levels<br>- Stand upwind when possible and minimize direct contact<br>- Avoid walking through discolored areas, puddles, leaning on drums or contacting anything that may; be contaminated.<br>- Don appropriate PPE (Level D minimum) to avoid skin and eye contact. Wear chemical resistant gloves and safety glasses to prevent skin/eye contact. If necessary, upgrade level of respiratory protection to avoid inhalation of volatile organic vapors in excess of action levels.<br>- Keep airborne dust levels to a minimum by wetting down surfaces as necessary<br>- No eating or smoking will be allowed in the exclusion zone and hand to mouth contact should be avoided to minimize potential ingestion of contaminants. |
| Physical injuries, such as abrasions, insect bites, back injuries, slips, trips, falls. | - Avoid slippery surfaces when possible.<br>- Practice good-housekeeping and keeps area free of obstructions and tripping hazards to extent practical.<br>- Practice safe lifting techniques.<br>▪ Use mechanical lifting device when possible<br>▪ Use buddy system when lifting heavy or awkward objects<br>▪ Do not jerk or twist body while lifting<br>- Know the location of other site workers at all times, especially before moving and/or starting up heavy equipment such as drill rig or truck.<br>- Do not climb on equipment. If repairs or maintenance is required, ensure that equipment is turned off, any wheels are appropriately chocked, all safety devices are in place, and appropriate PPE is donned. Use fall protection equipment if working on equipment where a fall from an unprotected height of 6 feet or more is possible.<br>- Drilling contractor shall ensure that all safety equipment is in place and operational. Safety devices should never be bypassed or tampered with.<br>- Be observant of possible insect nesting areas<br>- Have a first aid kit on hand<br>- Apply sun block and insect repellant as appropriate |

| HAZARDS | HAZARD CONTROL/PRECAUTION |
|---|---|
| Noise exposure | - Wear hearing protection if you must shout to hear someone who is standing one foot or less away. At a minimum, hearing protection should be worn whenever the hammer utilized to advance the soil sampler is utilized. |
| Contact with moving parts of drill rig and/or flying debris | - Do not stand unnecessarily close to the drill rig when it is operating.<br>- Know the location of the emergency shut-off switch.<br>- Don a hard hat and safety glasses (Level D) |
| Contact with overhead power lines and/or buried utilities/debris while drilling. | - Do not move drill rig when mast is up.<br>- Do not drill within 20 feet of overhead power lines.<br>- Call a utility locator to check for location of underground utilities.<br>- Use common sense when choosing drilling locations. |
| Inclement weather | - Cease site activities during electrical storm or other extreme weather<br>- Cease site activities in extreme temperatures |
| Heat and cold stress | - Dress appropriately, wear dry clothing.<br>- Take frequent breaks during extreme weather conditions.<br>- Refer to the section on heat stress or cold stress, as appropriate for additional precautions. |
| Fire | - Have a fire extinguisher on hand.<br>- Keep ignition sources away from flammable materials and atmospheres. |
| Security | - Stay alert to facility/neighborhood activities |
| Flammable Hazards | - At least one ABC rated fire extinguisher will be kept in the exclusion zone at all times.<br>- Explosive/flammable materials (e.g. fuel) will be stored only in approved facilities or containers.<br>- Smoking is not permitted on the Site or in any work areas.<br>- Do not use equipment that may generate a spark where there is a potential of explosive gases or vapors.<br>- Hot work (e.g. cutting, welding, torching) will only be permitted in the work area with a completed and authorized Hot Work Permit. |

# 8.0 AIR MONITORING & ACTION LEVELS

## 8.1 AIR MONITORING EQUIPMENT

The following environmental monitoring instruments shall be used on Site at the specified intervals.

Photoionization Detector (PID)

A PID with a 10.6 eV lamp shall be used during tasks that require any intrusive activities and/or as ordered by CHA personnel. At a minimum, the PID should be utilized at the start of all intrusive activities, whenever obvious contamination is noted, and at least every 15 to 30 minutes through the duration of the intrusive activities. PID measurements shall be taken in the breathing zone of on-Site personnel, in low areas where flammable vapor may accumulate, in the headspace of soil and water samples, downwind of intrusive activities, and around the perimeter of the exclusion zone, as appropriate.

The PID shall be calibrated daily following manufacturers recommendations. Calibration data shall be recorded in daily logs by the Field Team Leader.

Dust

Dust levels shall be visibly monitored. If it appears dust levels are increasing, a particulate meter shall be utilized following the manufacturer's recommendations.

Temperature

Ambient temperature should be monitored throughout the work day for potential heat stress or cold stress conditions. Based upon observed weather forecasts, a thermometer shall be utilized to monitor on-Site temperatures whenever the expected low temperature for the day is anticipated to be less than 20° Fahrenheit or the anticipated high temperature is anticipated to be in excess of 90° Fahrenheit.

## 8.2 ACTION LEVELS

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. Each action level is determined by

the concentration level (above background level) and the ability of the personal protective equipment to protect against that specific contaminant. The action levels are based on concentrations in the breathing zone.

Should action levels be reached, work operations shall cease until further evaluation is performed and safe levels are prevalent. If ambient levels are measured which exceed the action levels in areas accessible to the public or unprotected personnel, necessary site control measures (barricades, warning signs, and mitigative actions, etc.) must be implemented before commencing activities at the specific work site. If through engineering controls and monitoring, safe levels (below action levels) cannot be achieved, an upgrade in personal protection equipment shall be mandated by the task SHSO, or operations shall cease in that portion of the Site. The action levels at the landfill are as follows:

- Organic vapors (PID monitor) = consistent readings of:
  - <5 parts per million (ppm), Level D
  - >5 ppm and <25 ppm sustained for 5 minutes, upgrade to Level C
  - > 25 ppm, stop work activities generating organic vapors, investigate cause of elevated readings, and re-evaluate corrective measures prior to resuming work.
- Temperature = body core temperature of < 36°C (96.8°F) for cold stress

An upgrade to Level B or Level A PPE is not permitted for this project. If organic vapors concentrations cannot be reduced below 25 ppm, the drilling activities will be discontinued until a further evaluation of Site conditions can be completed.

## 8.3 COMMUNITY AIR MONITORING REQUIREMENTS

Air monitoring will be performed at the Site during the advancement of all soil borings and decontamination activities in accordance with the New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan (CAMP),* and DER-10. The CAMP provides requirements for perimeter monitoring of the work area to provide protection to the community and environment and is different than the monitoring performed in the work zone for health and safety purposes. The CAMP for the monitoring well installation/abandonment tasks is further described in CHA's Post-Remedial Monitoring Well Network Installation Work Plan, of which this HASP is an attachment to.

## 8.4 ENVIRONMENTAL SAMPLING

While advancing the borings for the monitoring wells, soil samples will be collected in split-spoon samplers. These samples will be classified for lithology and evaluated for evidence of visual, olfactory, and photoionic evidence of contamination using field screening techniques as the samples are collected. No samples will be collected for laboratory analysis as part of the well installation/abandonment tasks. While groundwater samples will be collected from these wells for laboratory analysis with eighteen (18) months following receipt of the Certification of Completion for the project, groundwater sampling will not be performed at this time.

# 9.0 PERSONAL PROTECTIVE EQUIPMENT

## 9.1 GENERAL INFORMATION

The purpose of personal protective clothing and equipment is to shield or isolate individuals from the chemical and physical hazards that may be encountered during work activities. The level of protection required must correspond to the level of hazard known, or suspected, in the specific work area.

There are four basic levels (A, B, C, and D) of personal protection as established by the United States Environmental Protection Agency (USEPA). Level A provides the highest level of protection and Level D provides the lowest.

- ***Level D*** will consist of field clothes, outer gloves (if soil/water contact is likely), steel toe and shank safety boots, safety glasses (for splash hazards), a hard hat, earplugs or similar hearing protection equipment, and reflective vests. Hearing protection shall be required at the discretion of the SHSO, but at a minimum, must be utilized by all on-Site personnel when the drill rig hammer is being utilized to advance the soil sampler.

- ***Modified Level D*** will consist of Tyvek coverall, safety glasses (for dust/splash hazards) outer gloves with disposable inner gloves, steel toe and shank work boots, overboots if free product is encountered or as otherwise specified, hearing protection and, if overhead hazards are present, such as during drilling, a hard hat. Safety glasses must also be worn during drilling.

- ***Level C*** will consist of the same equipment as listed for modified Level D with the addition of a full faced air purifying cartridge equipped respirator.

- ***Level B***, if required for working on this project Site, consists of the same equipment as listed for Level C with the substitution of a full faced Self-Contained Breathing Apparatus (SCBA) in place of a full faced air purifying respirator.

- ***Level A*** is not anticipated for this project.

When wearing Level C, B, or A, all junctures between the chemical protective coverall (i.e., Tyvek suit) and boots, gloves, and respirator must be taped. The suit must be placed over the boots and gloves. When taping, remember to leave a tab for easy removal. Stress spots in the suit must also be taped, such as under the arms, down the zipper, and up or across the back.

Personal protective equipment has been selected consistent with the hazards associated with the expected field activities. Personal protective equipment (PPE) is available in various sizes to provide a good fit for all personnel. PPE must be stored in a clean location with access by site workers. Site workers are responsible for maintenance and storage of equipment at the Site.

## 9.2 TASK SPECIFIC REQUIREMENTS

Based on evaluation of the potential hazards for the Site, the initial levels of PPE have been designated as a **Level D** based on the potential route of contact and the potential contaminants. It should be noted that much of the petroleum-contaminated soils have previously been removed from the Site and many of the borings will be installed fill placed as part of the remedial action. Only the three (3) borings along the eastern side of the Site are located in previously undistributed areas, Two of these wells are being installed as up-gradient wells to where major soil removal was previously conducted and one (1) of the borings (well MW-9) is located in an area where completed removal of grossly-impacted soils was not feasible due to the proximity to the MTA retaining wall and the potential that further excavation would undermine this structure.

No changes to the specified levels of PPE shall be made without first obtaining approval of the SHSO and the Project Team leader. If action levels are reached, work shall cease and the SSO and his advisors shall perform further evaluations. If necessary, an upgrade in PPE shall be mandated.

If an upgrade to Level C PPE is required, air purifying respirators equipped with organic vapor/acid gas/HEPA cartridges will be utilized. Organic vapor/acid gas/HEPA cartridges are the appropriate canister for use with the involved substances. All respirators used will be approved by NIOSH and/or the Mine Safety and Health Administration (MSHA) and their use shall be consistent with OSHA regulations in 29 CFR 1910.134. All on-Site personnel wearing a respirator shall have respirator clearance from a qualified occupational health physician. In addition, the respirator wearers on Site shall perform qualitative fit tests to ensure proper fit of the face seal of the respirator.

Inspection logs shall be completed, signed and kept with the HASP. Filter cartridges used shall be of the same manufacturer as the respirator and shall be changed on a daily basis at a minimum and/or if

breathing becomes difficult. Air purifying respirators shall not be used if any of the following conditions exist:

- Oxygen deficiency
- Immediately Dangerous to Life or Health (IDLH) concentrations of specific substances
- Entry into an unventilated or confined area which has not been characterized
- Presence or potential presence of unidentified contaminants
- Contaminant concentrations are unknown or exceed designated maximum use specifications
- Identified gases or vapors have inadequate warning properties
- High relative humidity, may reduce protection offered by sorbent

The need for Level A or Level B PPE is not anticipated for tasks covered by this HASP. Should Level C PPE be deemed insufficient based upon the conditions encountered in the field, all work activities will temporarily cease and the HASP will be updated prior to continuing any on-Site activities.

Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of the SSO and task manager based upon air monitoring results and the following:

***Reasons to upgrade:***

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas, vapor or dust emission.
- Change in work task that will increase the exposure or potential exposure with hazardous materials.

***Reasons to downgrade:***

- New information indicating that the situation is less hazardous than was originally suspected.
- Change in Site conditions that decrease the potential hazard.
- Change in work task that will reduce exposure to hazardous materials.

# 10.0 SITE CONTROL MEASURES

## 10.1 WORK ZONES

All Site work zones will be marked as applicable and discussed with all on-Site personnel. CHA's subcontractor(s) will be responsible for delineating and maintaining the work zones. Site work zones shall consist of the exclusion, support, and contamination reduction zones as required

The **exclusion zone** is the zone which contamination is most likely to be encountered. For the geotechnical investigation, the exclusion zone is considered to be a minimum of a 20-foot radius surrounding the drill rig. Flow of personnel and equipment into and out of the zone will be monitored throughout the investigation. While in the exclusion zone all personnel must wear the specified PPE.

The **contamination reduction zone** will be established between the exclusion zone and support zones prior to commencement of the drilling. Personnel working inside the exclusion zone will decontaminate or dispose all soiled clothing in the contamination reduction zone each time the exclusion zone is exited, if the clothing worn becomes soiled. Appropriate equipment, supplies, and personal PPE will be made available in the contamination reduction zone to facilitate the protection and decontamination of personnel working in the exclusion zone. All disposable PPE will be double-bagged in garbage bags for disposal. All wash water generated from decontamination processes will be collected and placed into 55-galon drums for future characterization and disposal.

A s**upport zone** will be established in close proximity to the Contamination Reduction Zone. This area will be used for operational direction and support facilities, emergency response, supplies/equipment, and worker rest areas.

## 10.2 COMMUNICATION

Communication shall be accomplished by a combination of person to person verbal correspondence, the use of cellular phones (for off-site/support personnel), and by verbal signals or hand signals depending on the pre-design programming task. Communication procedures will be reviewed at the Safety Meeting before entering the exclusion zone.

## 10.3 SITE SECURITY MEASURES

The contamination reduction zone and support zone shall be marked as appropriate and reviewed at the Safety Meeting. All personnel shall report to the field team leader upon entering and exiting the Site so that everyone will be accounted for.

# 11.0 DECONTAMINATION

All decontamination activities will be performed on a temporary decontamination pad constructed in the contamination reduction zone. All wash water generated from decontamination processes will be collected and containerized for future characterization and disposal.

## 11.1 PERSONAL PROTECTIVE EQUIPMENT

At a minimum, all non-disposable personnel protective clothing will be decontaminated by first washing the soiled items with a non-phosphate detergent and potable water mixture, followed by potable water and distilled water rinses. All disposable/expendable PPE and clothing will be placed into plastic trash bags for off-site disposal. At a minimum, all equipment that comes into contact with contaminated soil and groundwater will be decontaminated with a high-pressure steam cleaner.

## 11.2 SMALL EQUIPMENT & HAND TOOLS

Small hand tools and equipment (e.g. split spoons) will be decontaminated as appropriate, but, at a minimum, prior to removal from the Site. The recommended decontamination procedure for equipment used during the performance of the pre-design programming tasks is:

- Wash and scrub with tap water and low phosphate detergent (e.g. Alconox)
- Tap water rinse
- De-ionized water rinse

## 11.3 HEAVY EQUIPMENT

Heavy equipment (e.g. a drill rig) is anticipated to be utilized during the monitoring well installation/abandonment. It is anticipated that the hollow-stem augers will require decontamination between each borehole location. The decontamination procedure for the augers will include washing with a steam/hot water pressure washer. Following the completion of the last boring, the augers will be decontaminated one final time and the drill rig will be decontaminated as well if necessary (e.g. soiled tires). Decontamination will take place on the temporary containment pad in the contamination reduction zone.

## 12.0 HAZARD COMMUNICATION

In compliance with 29 CFR 1910.1200, any hazardous materials brought on Site by any personnel (CHA or contractors) shall be accompanied with an appropriate Material Safety Data Sheet (MSDS). The SHSO provided by the Contractor shall be responsible for maintaining the MSDSs on Site, reviewing them for hazards that working personnel may be exposed to, and evaluating their use on Site with respect to compatibility with other materials including personal protective equipment, and their hazards. MSDSs for typical fuels and lubricants associated with a drill rig have been included in Appendix C. Additional MSDSs for other substances brought on to the Site will be provided by the drilling subcontractor. Should the SSO deem the material too hazardous for use on Site, the party responsible for bringing the material on Site shall remove it from the Site.

## 13.0 CONFINED SPACE

Confined space entry is not anticipated during this project; however, in the event that a confined space entry is necessary then all confined space entry procedures, techniques, and equipment shall be consistent with OSHA regulations in 29 CFR 1910.146.

## 14.0 EMERGENCY PROCEDURES

On-Site emergencies can range in intensity from minor to serious conditions. Various procedures for responding to Site emergencies are listed in this section. The designated SHSO is responsible for contacting local emergency services in emergency situations (however, others must assume responsibility if the situation warrants). An injured person shall be accompanied by another worker at all times.

The following emergency procedures will be used by on-Site personnel. The SHSO shall be notified of any on-Site emergencies and be responsible for ensuring that the appropriate measures are followed. Non-emergencies will be treated on Site and documented and then directed to seek further medical attention. All occupational injuries and illnesses will be reported, recorded, and investigated.

CHA personnel will be equipped with a cellular telephone for communication. Other emergency equipment, including a first aid kit will be on Site at all times. In the case of a medical emergency, CHA personnel and Contractor SHSO will communicate to determine the nature of the emergency and the location. After it is determined whether there is an actual emergency, he/she will instruct someone to call for an ambulance. Cellular telephones would to be used to place such a call.

If an emergency evacuation of the Site must take place, all personnel on Site will immediately stop work, shut off all equipment, and assemble at the entrance to the Site. After assembly of all personnel, the Site will be evacuated using vehicles parked in the support zone. All vehicles will be parked facing out to enable a quick exit from the Site. If time permits, as determined by the SHSO, emergency decontamination will take place. This will consist of a wash and rinse of overboots, removal of disposable clothing, and washing of hands and face. After exiting the work area, all personnel will reassemble near the parking lot entrance onto Delaware Avenue. If the head count reveals someone is still on Site, the SHSO and his/her assistant will look for the person(s), using appropriate personal protection.

## 14.1 PERSONNEL INJURY

Upon notification of personnel injury the nature of the injury will be assessed, the appropriate first aid shall be initiated and, if necessary, contact shall be made for an ambulance and with the designated medical facility. If the injury increases the risk to others, activities on Site will stop until the added risk is removed or minimized.

## 14.2 FIRE/EXPLOSION

Upon notification of fire or explosion, all Site personnel shall assemble at a safe distance upwind of the involved area. The SHSO shall alert the appropriate fire department.

## 14.3 PPE FAILURE

If any Site worker experiences a failure or alteration of PPE that affects the protection factor that person and his/her buddy shall immediately exit the exclusion zone. Re-entry shall not be permitted until the equipment has been repaired or replaced.

## 14.4 CHEMICAL EXPOSURE

If any Site worker experiences adverse effects due to chemical exposure, the appropriate first aid procedures shall be followed according to the MSDS for that chemical. The person shall at a minimum be moved to fresh air. Whenever possible, personnel should be decontaminated before administering first aid.

Workers should go to the support zone as soon as any of the follow acute symptoms of exposure are experienced:

- Rotten egg odor (indicates hydrogen sulfide)
- Sweet almond-like odor (indicates cyanide presence)
- Headache
- Nausea or vomiting
- Fatigue
- Weakness
- Confusion
- Dizziness
- Irritation of eyes, nose, throat
- Dermatitis
- Chills
- Chest tightness
- Cough

- Muscle spasms
- Staggered gait
- Increased salivation
- Indigestion
- Diarrhea
- Irritability
- Metallic taste in mouth

## 14.5 SPILL CONTAINMENT

If onsite work results in the accidental spill or release of oil or hazardous materials, containment to the extent possible will be required by onsite personnel (in proper PPE). Containment should include the use of absorbent pads or materials, diking with soils, covering and/or diverting spills from sewers, drains, surface water bodies, etc. For spills that cannot be controlled by onsite personnel or are above the reportable quantities, the SSO or designee will secure the area and notify the NYSDEC Spills hotline and notify appropriate emergency personnel through the 9-1-1 system.

# 15.0 EMERGENCY MEDICAL CARE

## 15.1 NEAREST HOSPITAL

See Section 3.0 for directions to the nearest hospital.

## 15.2 ON-SITE FIRST AID

A first aid kit shall be maintained and stored within the Contamination Reduction Zone. General first aid procedures are identified in the list below:

**Skin/Eye Contact:** Flush eyes and/or skin thoroughly with water for 15 minutes. Remove contaminated clothing. If skin was contacted with a dry material, brush it off first, then flush with water. Seek medical attention if irritation develops.

**Ingestion:** Do not induce vomiting. Call the Poison Control Center. Tell them what was swallowed, if possible. Follow instructions. Arrange for transport of the victim to the hospital by calling for an ambulance.

**Inhalation:** Remove person from contaminated environment without risking your own safety. DO NOT ENTER A CONFINED SPACE UNLESS WEARING LEVEL B AND A STANDBY PERSON IS PRESENT. DO NOT ENTER EXCLUSION ZONE UNLESS WEARING ONE LEVEL HIGHER PROTECTION THAN VICTIM WAS WEARING. Administer CPR, if necessary. Bring victim to hospital or call ambulance.

**Injuries:** Do not move a victim who may have a back injury. Cover them with coats, blankets, or other appropriate items to keep them warm. Call an ambulance.

Apply pressure to bleeding wounds. If the victim is able, have the victim apply pressure to the wound. If they are not able, wear gloves to protect from exposure to blood. Put gauze bandages or other clean cloth over the wound. Do not remove blood-soaked bandages or cloth - instead put additional bandages or cloths over the blood-soaked bandages. Elevate the limb with the injury above the heart.

Administer CPR if victim does not have a pulse and if you are currently certified in CPR. Have someone call for an ambulance immediately if there is any possibility that the victim is having or had a heart attack.

Shock is likely to develop in any serious injury or illness. The following are signals of shock: restlessness or irritability; altered consciousness; pale, cool, moist skin; rapid breathing; and/or rapid pulse. In the event of shock, do the following: Immediately have someone call for an ambulance; have the victim lie down; elevate legs 12 inches unless you suspect head, neck, or back injuries; if victim is cool, cover the victim to prevent chilling; do not give the victim anything to drink, even if thirsty.

**Collapses:** If site personnel have unexplainably collapsed, all personnel must evacuate work area. Rescue personnel must don a level of protection higher than the victim was in before evacuating victim from work area. Confined space rescue always requires Level B protection. No one will re-enter the work area until the cause has been determined and the SHSO has determined that the area is safe to re-enter.

## 15.3 HEAT & COLD STRESS

### 15.3.1 Heat Stress

**Heat Stress Symptoms and Remedies**

Acclimatization and frequent rest periods must be established for conducting activities where heat stress may occur. Symptoms of heat stress and appropriate responses include:

- Heat Rash - redness of skin. Remedy - frequent rest and change of clothing.
- Heat Cramp - painful muscle spasms in hands feet, and/or abdomen. Remedy - administer lightly salted water (1/4 teaspoon per gallon) orally unless there are medical restrictions.

- Heat Exhaustion - clammy, moist, pale skin; dizziness, nausea rapid pulse, fainting. Remedy - remove to cooler area and administer fluids orally or have physician administer saline solution intravenously.

- Heat Stroke - hot dry skin; red, spotted or bluish; high body temperature of 104°F or greater, mental confusion, loss of consciousness, convulsions or coma. Remedy -immediately cool victim by immersion in cool water. Wrap in wet sheet while fanning, sponge with cool liquid. While fanning, treat for shock. Call for an ambulance. DO NOT DELAY TREATMENT. COOL BODY WHILE AWAITING AMBULANCE.

**Heat Stress - Precautions**

Precautions to take to reduce the possibility of heat stress include the following:

- Avoid caffeine and alcohol both during work hours and 24 hours before onsite activity.
- Drink water before feeling thirsty.
- Watch for signs and symptoms of heat stress.
- Rest in cool/dry areas, such as air conditioned vehicle or building or in the shade.
- Use cooling devices such as water sprays or fans to cool off.

### 15.3.2 Cold Stress

**Cold Stress Symptoms**

Cold Stress symptoms may include any or all of the following:

- Excessive fatigue
- Irritability
- Euphoria
- Drowsiness
- Uncontrollable shivering
- Frost nip
- Medical assistance is necessary if these symptoms persist.

**Cold Stress Treatment**

Cold stress and frostbite emergency care:

- Remove the patient to a warm, dry place.
- If clothing is wet, remove and replace with dry clothing.
- Keep patient warm. Re-warming of the patient should be gradual to avoid heat stroke symptoms.

- Dehydration or the loss of body fluids may result in cold injury due to a significant change in blood flow to the extremities. If patient is conscious and alert, warm sweet drinks should be provided.

- Extremities affected by frostbite should be gradually warmed up and returned to normal temperature. Moist compresses should be applied; begin with lukewarm compresses and slowly increase the temperature as changes in skin temperature are detected.

- Keep patient warm and calm, remove to a medical facility as soon as possible.

**Cold Stress - Prevention**

- Take breaks in heated shelters at frequent intervals when working in temperatures below 20°F, including wind chill.

- Remove outer layer of clothing when entering the shelter. Loosen other layers to allow sweat to evaporate.

- Drink warm, sweet liquids or soups to reduce possibility of cold injury. Avoid caffeine and alcohol.

## 16.0 STANDARD OPERATING PROCEDURES

The following standard operating procedures shall be implemented during this project:

- All construction activities shall be performed in compliance with all OSHA Construction Industry Standards and Regulations. Following the procedures, requirements, and provisions of this plan, all personnel who may be potentially exposed to hazardous materials or wastes shall be in compliance with federal/state regulations, OSHA 29 CFR 1910.120.

- Horseplay will NOT be tolerated under any circumstances.

- All work conducted on-Site shall be coordinated through the Project Team Leader and the SHSO.

- Minimize contact with hazardous substances.

- Use remote sampling, handling, and container-opening techniques whenever possible.

- Any container or vessel discovered onsite shall not be sampled, opened, or handled until an appropriate task specific plan for unknown drum/tank sampling has been implemented.

- Samples from areas known, or suspected, to be contaminated with hazardous substances shall be handled with appropriate personal protective equipment.

- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in evacuation of site personnel and reevaluation of the hazards and the level of protection. Contact the Company Health and Safety Coordinator to determine the appropriate actions to take.

- Protect monitoring and sampling instruments by bagging.

- Wear disposable outer garments and use disposable equipment where appropriate.

- Use proper dressing procedures before entering the Exclusion Zone and use all fasteners (zippers, snaps, buttons, etc.).

- All personal protective equipment and skin surfaces should be checked for cuts and/or punctures.

- All equipment used in site operations shall be properly cleaned and maintained in good working order. Equipment shall be inspected for signs of defect and/or contamination before and after use.

- Do not eat, smoke, chew gum, or drink on Site. Avoid any practice that may increase the probability of hand-to-mouth transfer and ingestion of material. Avoid any application of cosmetics. Personnel shall wash thoroughly before initiating any of the aforementioned activities.

- Avoid brushy areas to minimize allergic reactions to poison ivy, deer ticks, etc.

- Prescribed drugs should not be taken by personnel where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified person. Alcoholic beverages intake should be avoided.

- The "buddy system" must always be used and enforced. At a minimum, two persons who are in constant communication with each other shall be on Site at all times during any activity conducted on-Site in which the potential exists for exposure to hazardous materials, or accident or injury.

- Personnel entering the Contamination Reduction Zone and/or the Exclusion Zone must check in and out at the Access Control Points.

- All subcontractors shall abide by this Health & Safety Plan or provide one that is equivalent, at a minimum, to the conditions specified in this Health & Safety Plan.

- No workers with beards or heavy side burns are allowed to wear respirators.

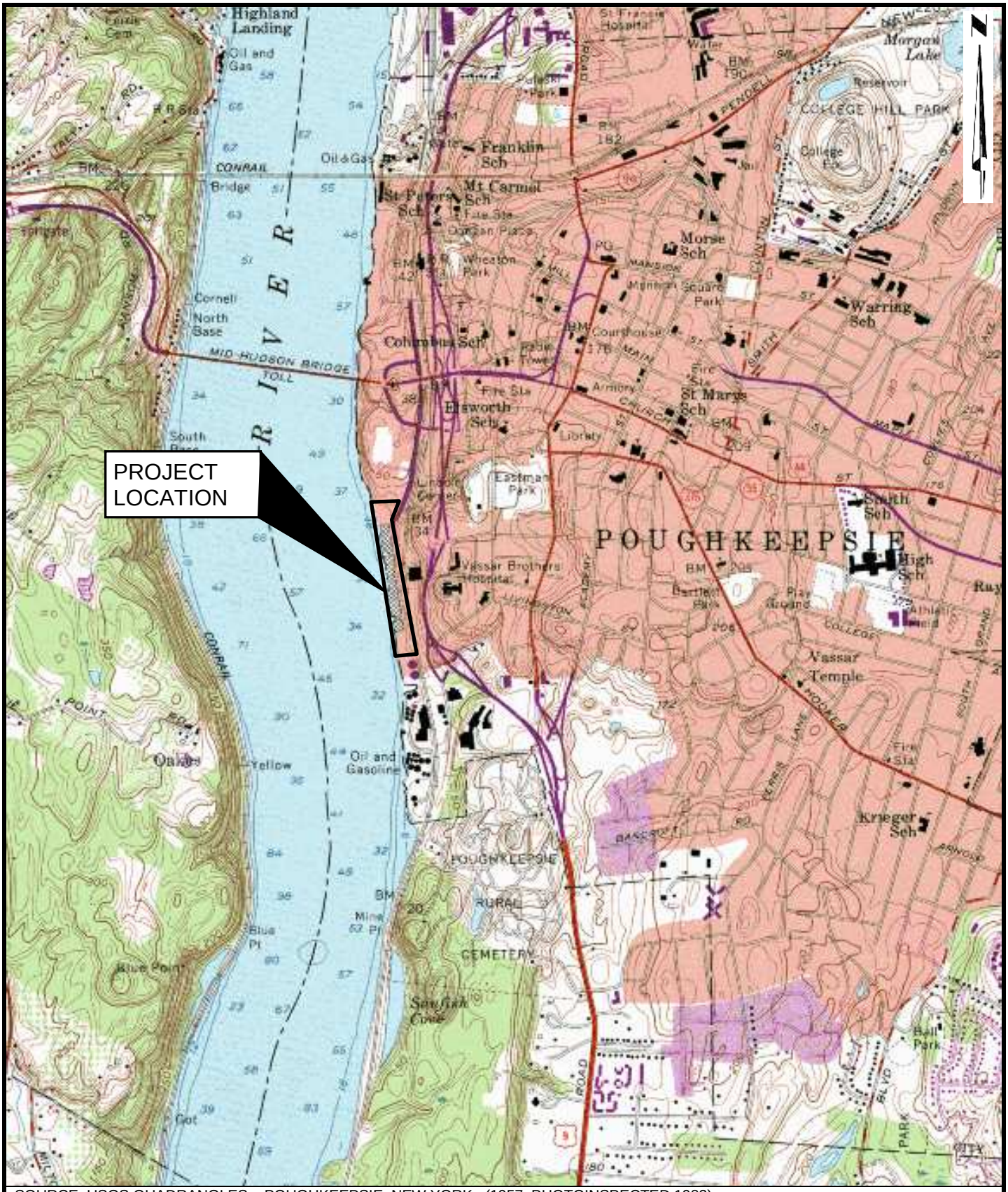
## 17.0 CERTIFICATION & AGREEMENT

This agreement must be signed by all CHA employees, subcontractors, and visitors before conducting field activities at this Site and/or entering the exclusion or decontamination zones.

*I have read this Health and Safety Plan and I understand the requirements of the Plan. I will conduct work at this Site in accordance with the requirements of the Health and Safety Plan.*

| Signature | Date | Company |
|---|---|---|
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |
| Signature | Date | Company |

**FIGURE**




SOURCE: USGS QUADRANGLES – POUGHKEEPSIE, NEW YORK. (1957, PHOTOINSPECTED 1982).
**SCALE: 1"=2000' ±**

CHA
©2010
441 South Salina Street, Syracuse, NY 13202-4712
Main: (315) 471-3920 • www.chacompanies.com

# VICNITY LOCATION MAP
## FORMER DELAVAL PROPERTY
CITY OF POUGHKEEPSIE
COUNTY OF DUTCHESS, STATE OF NEW YORK

PROJECT NO. 14357

DATE 08/20/10

FIGURE 1

M:\14357\Rpts\HASP\Figures\Figure 1 - Vicinity Location.doc

# APPENDIX A

# HAZWOPER Certifications

# APPENDIX B

## Analytical Summary Tables

# Figures

OIL STORAGE FACILITY

AOC-1

HUDSON RIVER

DELAVAL PROPERTY LINE (TYP.)

AOC-2

BURIED TANK

APPROXIMATE LOCATION OF FUEL LINE

HUDSON RIVER

FORMER WASTEWATER TREATMENT PLANT

EXISTING CONCRETE BULK HEAD

EXISTING CONCRETE BULK HEAD

42" RCP

SS-1 SS-2 SS-3 SS-4 SS-5 SS-6 SS-7 SS-8 SS-9 SS-10 SS-11 SS-12 SS-13 SS-14 SS-15 SS-16 SS-17 SS-18 SS-19 SS-20 SS-21 SS-22 SS-23 SS-24 SS-25 SS-26 SS-27 SS-28 SS-29

ROAD

CHAINLINK FENCE

ASPHALT

DRIVE

ASPHALT PAD

CONC. RETAINING WALL

RAILROAD TRACKS

AOC-4

AOC-3

CHAINLINK FENCE

ASPHALT DRIVE

## LEGEND

AREA OF CONCERN AS REPRESENTED IN THE CHAZEN COMPANIES PHASE II ESA REPORT

SS-5 SURFICIAL SOIL SAMPLE LOCATION

NOTE:

BASEMAP PROVIDED FROM THE CHAZEN COMPANIES (TCC) PHASE SUBSURFACE INVESTIGATION REPORT, DATED MAY 2001.

0 150 300

Scale in feet

CLOUGH HARBOUR & ASSOCIATES LLP
III Winners Circle, PO Box 5269, Albany, NY 12205
www.cloughharbour.com



11205.1011.1102

DATE: JANUARY, 2005

FIGURE 2

SURFICIAL SOIL SAMPLE LOCATION PLAN AND AREAS OF ENVIRONMENTAL CONCERN

DEVAVAL PROPERTY
CITY OF POUGHKEEPSIE
DUTCHESS COUNTY, STATE OF NEW YORK

File: M:\11205\Rpt\Supp_Invest-Final\Figures\1-31-05\Figure2_AEC-surf-soil-11x17.dwg User: 330 1/31/2005 03:31 PM

OIL STORAGE FACILITY

AOC-1

HUDSON RIVER

DELAVAL PROPERTY LINE (TYP.)

AOC-2/3

BURIED TANK

APPROXIMATE LOCATION OF FUEL LINE

HUDSON RIVER

FORMER WASTEWATER TREATMENT PLANT

AOC-4

EXISTING CONCRETE BULK HEAD

TP-11 TP-10 TP-9 TP-8 TP-7 TP-6 TP-5 TP-4 TP-12 TP-17 TP-16 TP-18 TP-13 TP-15 TP-1 TP-2 TP-3 TP-14

AT-1 AT-2 AT-3 AT-4 AT-5 AT-6

CHAINLINK FENCE

ASPHALT

DRIVE

TP-42 TP-43 TP-41

RAILROAD TRACKS

CONC. RETAINING WALL

TP-22 TP-23 TP-21 TP-24 TP-27 TP-25 TP-26 TP-28 TP-29 TP-30 TP-20 TP-19 TP-31 TP-44 TP-34 TP-35 TP-36 TP-33 TP-32 TP-38 TP-40 TP-39 TP-37

ASPHALT PAD

AT-8 AT-7

42" RCP

## LEGEND

AREA OF CONCERN BASED ON SUPPLEMENTAL INVESTIGATION

TP-1 ENVIRONMENTAL EXPLORATORY TEST PIT

AT-1 ARCHEOLOGICAL TEST PIT

NOTE:

BASEMAP PROVIDED FROM THE CHAZEN COMPANIES (TCC) PHASE SUBSURFACE INVESTIGATION REPORT, DATED MAY 2001.

0 150 300

Scale in feet

CLOUGH HARBOUR & ASSOCIATES LLP
III Winners Circle, PO Box 5289, Albany, NY 12205
www.cloughharbour.com



11205.1011.1102

DATE: JANUARY, 2005

FIGURE 3

TEST PIT LOCATION PLAN AND AREAS OF ENVIRONMENTAL CONCERN

DEVAVAL PROPERTY
CITY OF POUGHKEEPSIE
DUTCHESS COUNTY, STATE OF NEW YORK

File: M:\11205\Rpt\Supp_Invest-Final\Figures\1-31-05\Figure3_AEC-testpits-11x17.dwg User: 330 1/31/2005 03:31 PM

OIL STORAGE FACILITY

AOC-1

HUDSON RIVER

DELAVAL PROPERTY LINE (TYP.)

AOC-2/3

FORMER WASTEWATER TREATMENT PLANT

BURIED TANK

APPROXIMATE LOCATION OF FUEL LINE

HUDSON RIVER

EXISTING CONCRETE BULK HEAD

EXISTING CONCRETE BULK HEAD

42" RCP

CHA-2

CHA-3

CHA-5

CHA-6

MW-1

B-7

B-8

CHA-1

CHAINLINK FENCE

ASPHALT

DRIVE

ASPHALT PAD

CHA-4

CONC. RETAINING WALL

RAILROAD TRACKS

AOC-4

CHAINLINK FENCE

ASPHALT DRIVE

CHAINLINK FENCE

## LEGEND

AREA OF CONCERN BASED ON SUPPLEMENTAL INVESTIGATION

CHA-1 MONITORING WELL LOCATION

B-7 BORING LOCATION

NOTE:

BASEMAP PROVIDED FROM THE CHAZEN COMPANIES (TCC) PHASE SUBSURFACE INVESTIGATION REPORT, DATED MAY 2001.

0 150 300

Scale in feet

N

CLOUGH HARBOUR & ASSOCIATES LLP
III Winners Circle, PO Box 5269, Albany, NY 12205
www.cloughharbour.com



11205.1011.1102

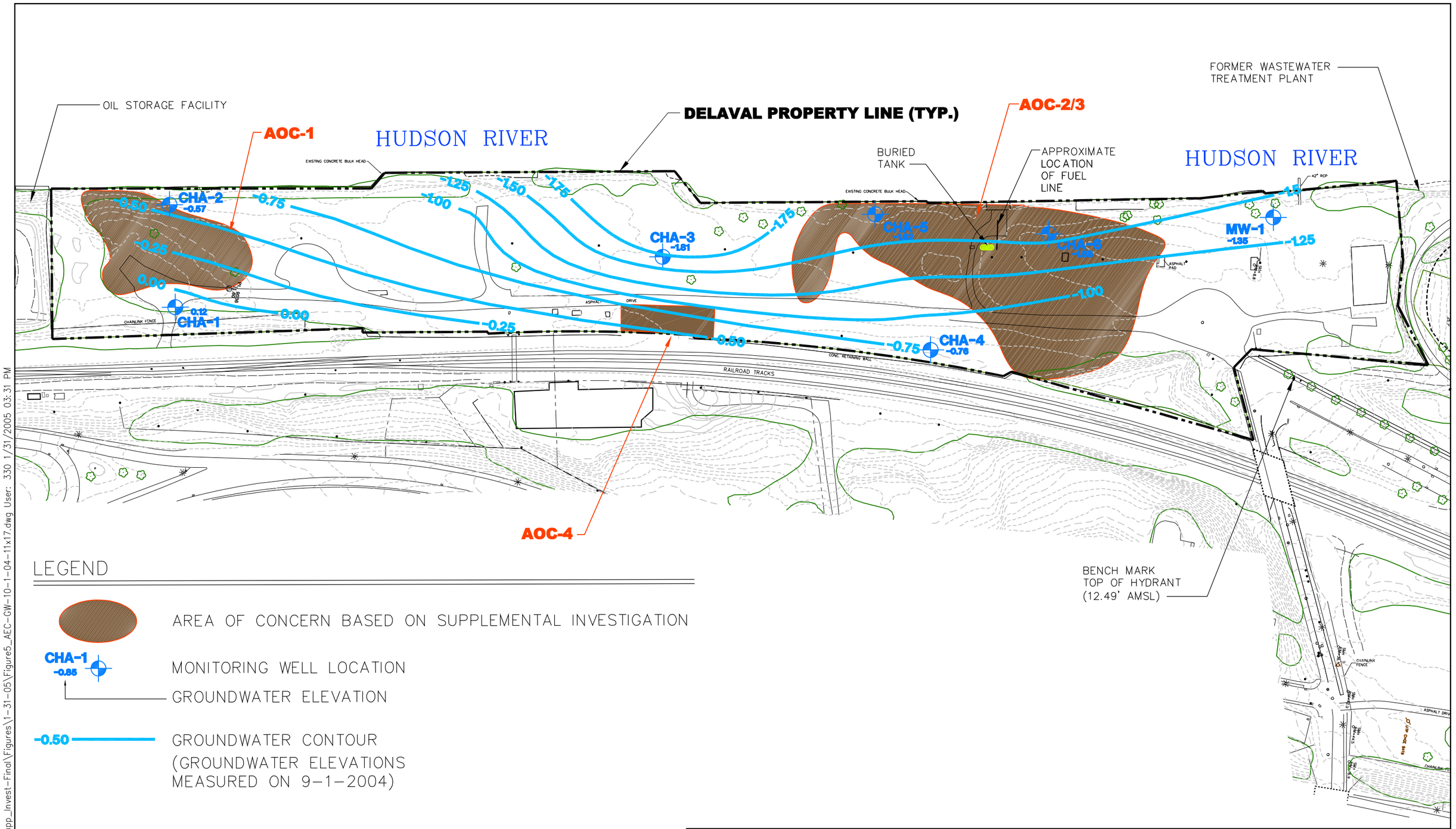
DATE: JANUARY, 2005

FIGURE 4

MONITORING WELL AND BORING LOCATION PLAN AND AREAS OF ENVIRONMENTAL CONCERN

DEVAVAL PROPERTY
CITY OF POUGHKEEPSIE
DUTCHESS COUNTY, STATE OF NEW YORK

File: M:\11205\Rpt\Supp_Invest-Final\Figures\1-31-05\Figure4_AEC-well-boring-11x17.dwg User: 330 1/31/2005 03:31 PM




## LEGEND

AREA OF CONCERN BASED ON SUPPLEMENTAL INVESTIGATION

CHA-1 -0.85 — MONITORING WELL LOCATION / GROUNDWATER ELEVATION

-0.50 — GROUNDWATER CONTOUR (GROUNDWATER ELEVATIONS MEASURED ON 9-1-2004)

NOTE:

BASEMAP PROVIDED FROM THE CHAZEN COMPANIES (TCC) PHASE SUBSURFACE INVESTIGATION REPORT, DATED MAY 2001.

0 150 300
Scale in feet

CLOUGH HARBOUR & ASSOCIATES LLP
III Winners Circle, PO Box 5269, Albany, NY 12205
www.cloughharbour.com

11205.1011.1102 | DATE: JANUARY, 2005

FIGURE 5
GROUNDWATER CONTOUR MAP AND AREAS OF ENVIRONMENTAL CONCERN

DEVAVAL PROPERTY
CITY OF POUGHKEEPSIE
DUTCHESS COUNTY, STATE OF NEW YORK

File: M:\11205\Rpt\Supp_Invest-Final\Figures\1-31-05\Figure5_AEC-GW-10-1-04-11x17.dwg User: 330 1/31/2005 03:31 PM

# Summary of Analytical Results

**Summary of Analytical Results for Surficial Soils**
**DeLaval Property Supplemental Investigation, July 2004**

| Contaminant of Concern | Standard, Criteria and Guidance Value | Concentration Range Detected[1] | Frequency of Samples Exceeding SCGs |
|---|---|---|---|
| **SVOCs** (units in micrograms per kilogram (μg/kg)) | | | |
| Acenaphthylene | 41,000 | 140-8,000 | 0 of 30 |
| Acenaphthene | 50,000 | 120-430 | 0 of 30 |
| Anthracene | 50,000 | 74-18,000 | 0 of 30 |
| Benzo(a)anthracene | 224 | 85-150,000 | 23 of 30 |
| Benzo(a)pyrene | 61 | 160-100,000 | 24 of 30 |
| Benzo(b)fluoranthene | 1,100 | 85-180,000 | 18 of 30 |
| Benzo(g,h,i)perylene | 50,000 | 110-25,000 | 0 of 30 |
| Benzo(k)fluoranthene | 1,100 | 150-64,000 | 10 of 30 |
| Bis(2-Ethylhexyl)phthalate | 50,000 | 220-6,100 | 0 of 30 |
| Carbazole | | 79-490 | Detected in 7 of 30 |
| Chrysene | 400 | 81-130,000 | 21 of 30 |
| Dibenz(a,h)anthracene | 14 | 100-120 | 2 of 30 |
| Dibenzofuran | 6,200 | 110-230 | 0 of 30 |
| Fluoranthene | 50,000 | 140-320,000 | 2 of 30 |
| Fluorene | 50,000 | 80-280 | 0 of 30 |
| Indeno(1,2,3-cd)pyrene | 3,200 | 88-16,000 | 2 of 30 |
| 2-Methylnapthalene | 36,400 | 160-310 | 0 of 30 |
| Naphthalene | 13,000 | 250-420 | 0 of 30 |
| Phenanthrene | 50,000 | 130-92,000 | 1 of 30 |
| Pyrene | 50,000 | 130-260,000 | 2 of 30 |
| **PCBs** (units in micrograms per kilogram (μg/kg)) | | | |
| Aroclor-1260 | 1,000 | 50-3600 | 3 of 30 |
| **METALS** (units in milligrams per liter (mg/L)) | | | |
| Arsenic | 7.5 | 4.89-24.8 | 20 of 30 |
| Barium | 300 | 15.1-374 | 2 of 30 |
| Cadmium | 1 or SB (1.93) | 0.973-8.7 | 25 of 30 |
| Chromium | 10 or SB (15.8) | 5.94-627 | 17 of 30 |
| Lead | 500 | 22.8-908 | 22 of 30 |
| Selenium | 2 | 0.602-3.20 | 6 of 30 |
| Silver | SB (0.117) | 0.149-240 | 12 of 30 |
| Mercury | 0.1 | 0.02-1.30 | 21 of 30 |

*Note: 1. If a single value is noted, the referenced parameter was detected either only one time, or multiple times at the same concentration.*

**Summary of Analytical Results for Subsurface Soils**
**Supplemental Investigation of the DeLaval Property, July & August 2004**

| Contaminant of Concern | Standard, Criteria and Guidance Value | Concentration Range Detected[1] | Frequency of Samples Exceeding SCGs |
|---|---|---|---|
| **VOCs** (units in micrograms per kilogram (μg/kg)) | | | |
| Acetone | 200 | 34-3,500 | 4 of 22 |
| Benzene | 60 | 43-2,300 | 2 of 22 |
| Carbon Disulfide | 2,700 | 1.6-56 | 0 of 22 |
| Chlorobenzene | 1,700 | 13,000 | 1 of 22 |
| Ethylbenzene | 5,500 | 3.5-530 | 0 of 22 |
| Methylene Chloride | 100 | 2.6-67 | 0 of 22 |
| Toluene | 1,500 | 2.8-320 | 0 of 22 |
| Tetrachloroethene | 1,400 | 4.1-110 | 0 of 22 |
| m/p-Xylene (Total) | 1,200 | 1.1-4,900 | 2 of 22 |
| o-Xylene | 1,200 | 0.47-1300 | 1 of 22 |
| **SVOCs** (units in micrograms per kilogram (μg/kg)) | | | |
| Acenaphthylene | 41,000 | 210-850 | 0 of 21 |
| Acenaphthene | 50,000 | 140-1500 | 0 of 21 |
| Anthracene | 50,000 | 62-3,300 | 0 of 21 |
| Benzo(a)anthracene | 224 | 130-11,000 | 13 of 21 |
| Benzo(a)pyrene | 61 | 96-14,000 | 11 of 21 |
| Benzo(b)fluoranthene | 1,100 | 77-19,000 | 5 of 21 |
| Benzo(g,h,i)perylene | 50,000 | 48-3,200 | 0 of 21 |
| Benzo(k)fluoranthene | 1,100 | 65-7,100 | 4 of 21 |
| Bis(2-Ethylhexyl)phthalate | 50,000 | 44-280 | 0 of 21 |
| Carbazole | | 100-550 | Detected in 4 of 21 |
| Chrysene | 400 | 120-13,000 | 10 of 21 |
| Dibenz(a,h)anthracene | 14 | 95-420 | 3 of 21 |
| Dibenzofuran | 6,200 | 59-160 | of 21 |
| Fluoranthene | 50,000 | 250-18,000 | of 21 |
| Fluorene | 50,000 | 49-1,800 | of 21 |
| Indeno(1,2,3-cd)pyrene | 3,200 | 56-2,200 | 0 of 21 |
| 2-Methylnapthalene | 36,400 | 54-7,500 | of 21 |
| Naphthalene | 13,000 | 91-490 | 0 of 21 |
| Phenanthrene | 50,000 | 180-10 | 0 of 21 |
| Pyrene | 50,000 | 61-18,000 | 0 of 21 |
| **PCBs** (units in micrograms per kilogram (μg/kg)) | | | |
| Aroclor-1254 | 10,000 | 97-11,000 | 1 of 21 |
| Aroclor-1260 | 10,000 | 60-340 | 0 of 21 |
| **METALS** (units in milligrams per liter (mg/L)) | | | |
| Arsenic | 7.5 | 0.306-35.5 | 12 of 21 |
| Barium | 300 | 10.1-1,900 | 4 of 21 |
| Cadmium | 1 or SB (1.93) | 0.307-21.7 | 11 of 21 |

| Contaminant of Concern | Standard, Criteria and Guidance Value | Concentration Range Detected[1] | Frequency of Samples Exceeding SCGs |
|---|---|---|---|
| Chromium | 10 or SB (15.8) | 4.17-1,730 | 13 of 21 |
| Lead | 500 | 16.4-17,200 | 12 of 21 |
| Selenium | 2 | 0.564-9.18 | 7 of 21 |
| Silver | SB (0.11) | 0.206-1.13 | 7 of 21 |
| Mercury | 0.1 | 0.01-1.4 | 7 of 21 |

*Note: 1. If a single value is noted, the referenced parameter was detected either only one time, or multiple times at the same concentration.*

**Summary of Analytical Results for Groundwater**
**Supplemental Investigation of the DeLaval Property, August & October 2004**

| Contaminant of Concern | Standard, Criteria and Guidance Value | Concentration Range Detected[1] | Frequency of Samples Exceeding SCGs |
|---|---|---|---|
| **VOCs** (units in micrograms per kilogram (µg/kg)) | | | |
| cis-1,2-Dichloroethene | 5 | 0.77 - 49 | 1 of 8 |
| Trichloroethene | 5 | 0.67 - 5.0 | 1 of 8 |
| **SVOCs** (units in micrograms per kilogram (µg/kg)) | | | |
| Acenaphthene | 20[2] | 2.6 | 0 of 8 |
| Bis(2-Ethylhexyl)phthalate | 5 | 1.2-1.8 | 0 of 8 |
| Di-n-butylphthalate | 50[2] | 3.9 | 0 of 8 |
| Fluorene | 50[2] | 2.2 | 0 of 8 |
| Naphthalene | 10 | 1.5 | 0 of 8 |
| Phenanthrene | 50[2] | 1.1 | 0 of 8 |
| **PCBs** (units in micrograms per kilogram (µg/kg)) | | | |
| Aroclor-1260 | 0.09 | 0.31 - 4.7 | 2 of 9 |
| **METALS** (units in milligrams per liter (mg/L)) | | | |
| Barium | 1,000 | 16.1-204 | 0 of 8 |
| Chromium | 50 | 1.8-3.1 | 0 of 8 |
| Lead | 25 | 21-39.2 | 1 of 8 |
| Mercury | 0.7 | 0.03-0.08 | 0 of 8 |

*Note: 1. If a single value is noted, the referenced parameter was detected either only one time, or multiple times at the same concentration.*
*2. Indicates value is a guidance value rather than a standard.*

# Analytical Summary Tables

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-1<br>S3753-01<br>07/22/04<br>1.0<br>ug/Kg | SS-1DL<br>S3753-01DL<br>07/22/04<br>5.0<br>ug/Kg | SS-2<br>S3753-02<br>07/22/04<br>1.0<br>ug/Kg | SS-3<br>S3753-03<br>07/22/04<br>1.0<br>ug/Kg | SS-3DL<br>S3753-03DL<br>07/22/04<br>5.0<br>ug/Kg | SS-4<br>S3753-04<br>07/22/04<br>1.0<br>ug/Kg | SS-5<br>S3753-05<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 38 U | 190 UD | 36 U | 35 U | 180 UD | 37 U | 230 U |
| 1,2-Dichlorobenzene | 7,900 | 42 U | 210 UD | 40 U | 39 U | 200 UD | 40 U | 250 U |
| 1,3-Dichlorobenzene | 1,600 | 29 U | 140 UD | 27 U | 27 U | 130 UD | 27 U | 170 U |
| 1,4-Dichlorobenzene | 8,500 | 32 U | 160 UD | 31 U | 30 U | 150 UD | 31 U | 200 U |
| 2,2-oxybis(1-Chloropropane) | | 42 U | 210 UD | 40 U | 39 U | 190 UD | 40 U | 250 U |
| N-Nitroso-di-n-propylamine | | 34 U | 170 UD | 32 U | 32 U | 160 UD | 33 U | 210 U |
| Hexachloroethane | | 37 U | 190 UD | 35 U | 34 U | 170 UD | 36 U | 220 U |
| Nitrobenzene | 200 | 39 U | 200 UD | 37 U | 37 U | 180 UD | 38 U | 240 U |
| Isophorone | 4,400 | 29 U | 140 UD | 27 U | 27 U | 130 UD | 28 U | 170 U |
| bis(2-Chloroethoxy)methane | | 35 U | 180 UD | 34 U | 33 U | 160 UD | 34 U | 210 U |
| 1,2,4-Trichlorobenzene | 3,400 | 22 U | 110 UD | 21 U | 21 U | 100 UD | 21 U | 130 U |
| Naphthalene | 13,000 | 280 J | 420 JD | 16 U | 16 U | 78 UD | 16 U | 100 U |
| 4-Chloroaniline | 220 or MDL | 290 U | 1400 UD | 270 U | 270 U | 1300 UD | 280 U | 1700 U |
| Hexachlorobutadiene | | 27 U | 140 UD | 26 U | 25 U | 130 UD | 26 U | 160 U |
| 2-Methylnaphthalene | 36,400 | 160 J | 67 UD | 13 U | 12 U | 62 UD | 13 U | 81 U |
| Hexachlorocyclopentadiene | | 19 U | 97 UD | 18 U | 18 U | 90 UD | 19 U | 120 U |
| 2-Chloronaphthalene | | 16 U | 81 UD | 15 U | 15 U | 75 UD | 16 U | 98 U |
| 2-Nitroaniline | 430 or MDL | 28 U | 140 UD | 27 U | 26 U | 130 UD | 27 U | 170 U |
| Dimethylphthalate | 2,000 | 19 U | 93 UD | 18 U | 17 U | 86 UD | 18 U | 110 U |
| Acenaphthylene | 41,000 | 140 J | 120 UD | 22 U | 22 U | 110 UD | 22 U | 140 U |
| 2,6-Dinitrotoluene | 1,000 | 33 U | 170 UD | 31 U | 31 U | 150 UD | 32 U | 200 U |
| 3-Nitroaniline | 500 or MDL | 130 U | 630 UD | 120 U | 120 U | 580 UD | 120 U | 760 U |
| Acenaphthene | 50,000** | 430 J | 530 JD | 120 J | 16 U | 79 UD | 16 U | 100 U |
| Dibenzofuran | 6,200 | 230 J | 130 UD | 24 U | 24 U | 120 UD | 24 U | 150 U |
| 2,4-Dinitrotoluene | | 15 U | 77 UD | 15 U | 14 U | 72 UD | 15 U | 93 U |
| Diethylphthalate | 71,000 | 24 U | 120 UD | 23 U | 23 U | 110 UD | 23 U | 150 U |
| 4-Chlorophenyl-phenylether | | 19 U | 96 UD | 18 U | 18 U | 89 UD | 18 U | 120 U |
| Fluorene | 50,000** | 280 J | 110 UD | 80 J | 20 U | 100 UD | 21 U | 130 U |
| 4-Nitroaniline | | 61 U | 300 UD | 58 U | 56 U | 280 UD | 58 U | 370 U |
| N-Nitrosodiphenylamine | | 20 U | 98 UD | 19 U | 18 U | 91 UD | 19 U | 120 U |
| 4-Bromophenyl-phenylether | | 20 U | 100 UD | 19 U | 19 U | 95 UD | 20 U | 120 U |
| Hexachlorobenzene | 410 | 15 U | 73 UD | 14 U | 13 U | 67 UD | 14 U | 88 U |
| Phenanthrene | 50,000** | 6300 EJ | 4500 D | 970 | 330 J | 80 UD | 290 J | 1100 J |
| Anthracene | 50,000** | 830 | 1100 JD | 230 J | 74 J | 86 UD | 18 U | 110 U |
| Carbazole | | 380 J | 490 JD | 79 J | 16 U | 79 UD | 16 U | 100 U |
| Di-n-butylphthalate | 8,100 | 10 U | 52 UD | 9.8 U | 9.6 U | 48 UD | 9.9 U | 62 U |
| Fluoranthene | 50,000** | 8500 EJ | 6800 D | 1600 | 630 J | 540 JD | 540 J | 3000 J |
| Pyrene | 50,000** | 7700 EJ | 6600 D | 1500 | 530 J | 490 JD | 560 J | 2500 J |
| Butylbenzylphthalate | 50,000** | 26 U | 130 UD | 25 U | 24 U | 120 UD | 25 U | 160 U |
| 3,3-Dichlorobenzidine | | 120 U | 620 UD | 120 U | 120 U | 580 UD | 120 U | 750 U |
| Benzo(a)anthracene | 224 or MDL | 3300 | 3200 JD | 900 | 320 J | 54 UD | 320 J | 1600 J |
| Chrysene | 400 | 2800 | 2400 JD | 790 | 300 J | 110 UD | 350 J | 1600 J |
| bis(2-Ethylhexyl)phthalate | 50,000** | 18 U | 89 UD | 17 U | 6100 EJ | 4900 D | 220 J | 110 U |
| Di-n-octyl phthalate | 50,000** | 19 U | 93 UD | 18 U | 17 U | 86 UD | 18 U | 110 U |
| Benzo(b)fluoranthene | 1,100 | 4600 J | 3600 JD | 1600 J | 450 J | 190 UD | 510 J | 2000 J |
| Benzo(k)fluoranthene | 1,100 | 2300 | 1900 JD | 720 J | 290 J | 120 UD | 360 J | 840 J |
| Benzo(a)pyrene | 61 or MDL | 3000 | 2600 JD | 940 | 260 J | 62 UD | 310 J | 1300 J |
| Indeno(1,2,3-cd)pyrene | 3,200 | 420 J | 500 JD | 180 J | 96 J | 87 UD | 88 J | 800 J |
| Dibenz(a,h)anthracene | 14 or MDL | 100 J | 110 UD | 22 U | 21 U | 110 UD | 22 U | 140 U |
| Benzo(g,h,i)perylene | 50,000** | 940 | 920 JD | 370 J | 110 J | 160 UD | 160 J | 770 J |
| Total Confident Conc. SVOC | | 42,690 | 35,560 | 10,079 | 9,490 | 5,930 | 3,708 | 15,510 |
| Total TICs | | 23,830 | 0 | 25,350 | 17,870 | 0 | 7,690 | 53,900 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-6<br>S3753-06<br>07/22/04<br>1.0<br>ug/Kg | SS-7<br>S3753-07<br>07/22/04<br>5.0<br>ug/Kg | SS-8<br>S3753-08<br>07/22/04<br>1.0<br>ug/Kg | SS-9<br>S3753-09<br>07/22/04<br>1.0<br>ug/Kg | SS-10<br>S3753-10<br>07/22/04<br>5.0<br>ug/Kg | SS-11<br>S3753-11<br>07/22/04<br>1.0<br>ug/Kg | SS-12<br>S3753-12<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 200 U | 220 U | 38 U | 190 U | 200 U | 39 U | 180 U |
| 1,2-Dichlorobenzene | 7,900 | 220 U | 240 U | 42 U | 210 U | 220 U | 43 U | 200 U |
| 1,3-Dichlorobenzene | 1,600 | 150 U | 160 U | 28 U | 140 U | 150 U | 29 U | 140 U |
| 1,4-Dichlorobenzene | 8,500 | 170 U | 190 U | 32 U | 160 U | 170 U | 33 U | 150 U |
| 2,2-oxybis(1-Chloropropane) | | 220 U | 240 U | 42 U | 200 U | 220 U | 43 U | 200 U |
| N-Nitroso-di-n-propylamine | | 180 U | 200 U | 34 U | 170 U | 180 U | 35 U | 160 U |
| Hexachloroethane | | 200 U | 210 U | 37 U | 180 U | 190 U | 38 U | 170 U |
| Nitrobenzene | 200 | 210 U | 230 U | 39 U | 190 U | 200 U | 40 U | 190 U |
| Isophorone | 4,400 | 150 U | 170 U | 29 U | 140 U | 150 U | 29 U | 140 U |
| bis(2-Chloroethoxy)methane | | 190 U | 200 U | 35 U | 170 U | 180 U | 36 U | 170 U |
| 1,2,4-Trichlorobenzene | 3,400 | 120 U | 130 U | 22 U | 110 U | 110 U | 23 U | 110 U |
| Naphthalene | 13,000 | 89 U | 97 U | 17 U | 82 U | 87 U | 17 U | 80 U |
| 4-Chloroaniline | 220 or MDL | 1500 U | 1600 U | 290 U | 1400 U | 1500 U | 290 U | 1400 U |
| Hexachlorobutadiene | | 140 U | 160 U | 27 U | 130 U | 140 U | 28 U | 130 U |
| 2-Methylnaphthalene | 36,400 | 71 U | 77 U | 13 U | 65 U | 69 U | 14 U | 63 U |
| Hexachlorocyclopentadiene | | 100 U | 110 U | 19 U | 95 U | 100 U | 20 U | 92 U |
| 2-Chloronaphthalene | | 86 U | 93 U | 16 U | 79 U | 83 U | 16 U | 76 U |
| 2-Nitroaniline | 430 or MDL | 150 U | 160 U | 28 U | 140 U | 140 U | 29 U | 130 U |
| Dimethylphthalate | 2,000 | 98 U | 110 U | 18 U | 90 U | 95 U | 19 U | 87 U |
| Acenaphthylene | 41,000 | 120 U | 130 U | 23 U | 110 U | 1700 J | 24 U | 110 U |
| 2,6-Dinitrotoluene | 1,000 | 170 U | 190 U | 33 U | 160 U | 170 U | 34 U | 160 U |
| 3-Nitroaniline | 500 or MDL | 660 U | 720 U | 120 U | 610 U | 650 U | 130 U | 590 U |
| Acenaphthene | 50,000** | 91 U | 98 U | 17 U | 83 U | 88 U | 17 U | 81 U |
| Dibenzofuran | 6,200 | 140 U | 150 U | 25 U | 120 U | 130 U | 26 U | 120 U |
| 2,4-Dinitrotoluene | | 82 U | 89 U | 15 U | 75 U | 80 U | 16 U | 73 U |
| Diethylphthalate | 71,000 | 130 U | 140 U | 24 U | 120 U | 130 U | 25 U | 120 U |
| 4-Chlorophenyl-phenylether | | 100 U | 110 U | 19 U | 94 U | 99 U | 20 U | 91 U |
| Fluorene | 50,000** | 120 U | 130 U | 22 U | 110 U | 110 U | 22 U | 100 U |
| 4-Nitroaniline | | 320 U | 350 U | 60 U | 300 U | 310 U | 62 U | 290 U |
| N-Nitrosodiphenylamine | | 100 U | 110 U | 20 U | 96 U | 100 U | 20 U | 93 U |
| 4-Bromophenyl-phenylether | | 110 U | 120 U | 20 U | 99 U | 110 U | 21 U | 96 U |
| Hexachlorobenzene | 410 | 77 U | 83 U | 14 U | 71 U | 75 U | 15 U | 69 U |
| Phenanthrene | 50,000** | 1500 J | 3100 J | 130 J | 980 J | 6500 | 18 U | 2200 J |
| Anthracene | 50,000** | 470 J | 810 J | 18 U | 90 U | 1600 J | 19 U | 580 J |
| Carbazole | | 91 U | 98 U | 17 U | 83 U | 460 J | 17 U | 81 U |
| Di-n-butylphthalate | 8,100 | 55 U | 59 U | 10 U | 50 U | 53 U | 10 U | 49 U |
| Fluoranthene | 50,000** | 3300 J | 5700 | 300 J | 2200 J | 24000 | 140 J | 2800 J |
| Pyrene | 50,000** | 2600 J | 5100 | 270 J | 1800 J | 15000 | 130 J | 2500 J |
| Butylbenzylphthalate | 50,000** | 140 U | 150 U | 26 U | 130 U | 130 U | 26 U | 120 U |
| 3,3-Dichlorobenzidine | | 660 U | 710 U | 120 U | 610 U | 640 U | 130 U | 590 U |
| Benzo(a)anthracene | 224 or MDL | 1800 J | 3400 J | 200 J | 1200 J | 10000 | 85 J | 1400 J |
| Chrysene | 400 | 1500 J | 2400 J | 200 J | 1200 J | 7200 | 81 J | 1200 J |
| bis(2-Ethylhexyl)phthalate | 50,000** | 94 U | 100 U | 18 U | 87 U | 92 U | 18 U | 84 U |
| Di-n-octyl phthalate | 50,000** | 98 U | 110 U | 18 U | 90 U | 95 U | 19 U | 87 U |
| Benzo(b)fluoranthene | 1,100 | 1700 J | 3800 J | 200 J | 1500 J | 11000 J | 85 J | 1300 J |
| Benzo(k)fluoranthene | 1,100 | 1000 J | 1400 J | 150 J | 640 J | 7500 | 27 U | 500 J |
| Benzo(a)pyrene | 61 or MDL | 1300 J | 2300 J | 160 J | 720 J | 6900 | 14 U | 900 J |
| Indeno(1,2,3-cd)pyrene | 3,200 | 460 J | 490 J | 19 U | 410 J | 1100 J | 19 U | 380 J |
| Dibenz(a,h)anthracene | 14 or MDL | 120 U | 130 U | 23 U | 110 U | 120 U | 23 U | 110 U |
| Benzo(g,h,i)perylene | 50,000** | 490 J | 680 J | 34 U | 420 J | 1800 J | 34 U | 370 J |
| Total Confident Conc. SVOC | | 16,120 | 29,180 | 1,610 | 11,070 | 94,760 | 521 | 14,130 |
| Total TICs | | 3,100 | 6,510 | 7,290 | 4,080 | 19,100 | 6,680 | 6,680 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-13<br>S3753-13<br>07/22/04<br>5.0<br>ug/Kg | SS-14<br>S3753-14<br>07/22/04<br>1.0<br>ug/Kg | SS-14B<br>S3753-15<br>07/22/04<br>1.0<br>ug/Kg | SS-14BDL<br>S3753-15DL<br>07/22/04<br>5.0<br>ug/Kg | SS-15<br>S3753-16<br>07/22/04<br>1.0<br>ug/Kg | SS-16<br>S3753-17<br>07/22/04<br>1.0<br>ug/Kg | SS-17<br>S3753-18<br>07/22/04<br>5.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 920 U | 34 U | 35 U | 170 UD | 39 U | 170 U | 200 U |
| 1,2-Dichlorobenzene | 7,900 | 1000 U | 38 U | 39 U | 190 UD | 43 U | 190 U | 220 U |
| 1,3-Dichlorobenzene | 1,600 | 690 U | 26 U | 26 U | 130 UD | 29 U | 130 U | 150 U |
| 1,4-Dichlorobenzene | 8,500 | 780 U | 29 U | 30 U | 150 UD | 33 U | 150 U | 170 U |
| 2,2-oxybis(1-Chloropropane) | | 1000 U | 38 U | 38 U | 190 UD | 43 U | 190 U | 220 U |
| N-Nitroso-di-n-propylamine | | 830 U | 31 U | 31 U | 160 UD | 35 U | 160 U | 180 U |
| Hexachloroethane | | 890 U | 33 U | 34 U | 170 UD | 38 U | 170 U | 190 U |
| Nitrobenzene | 200 | 950 U | 35 U | 36 U | 180 UD | 41 U | 180 U | 200 U |
| Isophorone | 4,400 | 700 U | 26 U | 26 U | 130 UD | 30 U | 130 U | 150 U |
| bis(2-Chloroethoxy)methane | | 850 U | 32 U | 32 U | 160 UD | 36 U | 160 U | 180 U |
| 1,2,4-Trichlorobenzene | 3,400 | 540 U | 20 U | 20 U | 100 UD | 23 U | 100 U | 110 U |
| Naphthalene | 13,000 | 410 U | 15 U | 15 U | 77 UD | 17 U | 77 U | 87 U |
| 4-Chloroaniline | 220 or MDL | 6900 U | 260 U | 260 U | 1300 UD | 300 U | 1300 U | 1500 U |
| Hexachlorobutadiene | | 660 U | 24 U | 25 U | 120 UD | 28 U | 120 U | 140 U |
| 2-Methylnaphthalene | 36,400 | 320 U | 12 U | 12 U | 61 UD | 14 U | 61 U | 69 U |
| Hexachlorocyclopentadiene | | 470 U | 17 U | 18 U | 89 UD | 20 U | 89 U | 100 U |
| 2-Chloronaphthalene | | 390 U | 14 U | 15 U | 74 UD | 17 U | 74 U | 83 U |
| 2-Nitroaniline | 430 or MDL | 680 U | 25 U | 26 U | 130 UD | 29 U | 130 U | 150 U |
| Dimethylphthalate | 2,000 | 450 U | 17 U | 17 U | 85 UD | 19 U | 84 U | 96 U |
| Acenaphthylene | 41,000 | 6600 J | 370 J | 540 J | 420 JD | 24 U | 110 U | 1100 J |
| 2,6-Dinitrotoluene | 1,000 | 800 U | 30 U | 30 U | 150 UD | 34 U | 150 U | 170 U |
| 3-Nitroaniline | 500 or MDL | 3000 U | 110 U | 110 U | 570 UD | 130 U | 570 U | 650 U |
| Acenaphthene | 50,000** | 410 U | 15 U | 16 U | 78 UD | 18 U | 78 U | 88 U |
| Dibenzofuran | 6,200 | 620 U | 23 U | 23 U | 120 UD | 26 U | 120 U | 130 U |
| 2,4-Dinitrotoluene | | 370 U | 14 U | 14 U | 71 UD | 16 U | 71 U | 80 U |
| Diethylphthalate | 71,000 | 590 U | 22 U | 22 U | 110 UD | 25 U | 110 U | 130 U |
| 4-Chlorophenyl-phenylether | | 460 U | 17 U | 18 U | 88 UD | 20 U | 88 U | 99 U |
| Fluorene | 50,000** | 530 U | 20 U | 20 U | 100 UD | 23 U | 100 U | 110 U |
| 4-Nitroaniline | | 1500 U | 54 U | 56 U | 280 UD | 63 U | 280 U | 310 U |
| N-Nitrosodiphenylamine | | 480 U | 18 U | 18 U | 90 UD | 20 U | 90 U | 100 U |
| 4-Bromophenyl-phenylether | | 490 U | 18 U | 19 U | 93 UD | 21 U | 93 U | 110 U |
| Hexachlorobenzene | 410 | 350 U | 13 U | 13 U | 66 UD | 15 U | 66 U | 75 U |
| Phenanthrene | 50,000** | 22000 | 1200 | 1800 | 1300 JD | 290 J | 3100 J | 6900 J |
| Anthracene | 50,000** | 5500 J | 270 J | 370 J | 360 JD | 120 J | 790 J | 1300 J |
| Carbazole | | 410 U | 86 J | 110 J | 78 UD | 18 U | 78 U | 450 J |
| Di-n-butylphthalate | 8,100 | 250 U | 9.2 U | 9.4 U | 47 UD | 11 U | 47 U | 53 U |
| Fluoranthene | 50,000** | 88000 | 4600 | 6500 EJ | 4600 D | 910 | 8000 | 19000 |
| Pyrene | 50,000** | 54000 | 2900 | 4000 | 3200 JD | 910 | 5800 | 11000 |
| Butylbenzylphthalate | 50,000** | 630 U | 23 U | 24 U | 120 UD | 27 U | 120 U | 130 U |
| 3,3-Dichlorobenzidine | | 3000 U | 110 U | 110 U | 570 UD | 130 U | 570 U | 640 U |
| Benzo(a)anthracene | 224 or MDL | 42000 | 2200 | 3100 | 2500 JD | 680 J | 3800 | 8100 |
| Chrysene | 400 | 31000 | 1500 | 2200 | 2000 JD | 570 J | 3200 J | 6000 |
| bis(2-Ethylhexyl)phthalate | 50,000** | 430 U | 16 U | 16 U | 81 UD | 18 U | 81 U | 92 U |
| Di-n-octyl phthalate | 50,000** | 450 U | 17 U | 17 U | 85 UD | 19 U | 84 U | 96 U |
| Benzo(b)fluoranthene | 1,100 | 49000 J | 2900 J | 5300 J | 2900 JD | 900 J | 5100 J | 10000 |
| Benzo(k)fluoranthene | 1,100 | 25000 | 1300 | 2100 | 1200 JD | 430 J | 1900 J | 3600 J |
| Benzo(a)pyrene | 61 or MDL | 26000 | 1400 | 2100 | 1600 JD | 610 J | 3100 J | 5200 |
| Indeno(1,2,3-cd)pyrene | 3,200 | 5200 J | 340 J | 370 J | 610 JD | 120 J | 810 J | 1400 J |
| Dibenz(a,h)anthracene | 14 or MDL | 550 U | 20 U | 120 J | 100 UD | 23 U | 100 U | 120 U |
| Benzo(g,h,i)perylene | 50,000** | 7700 J | 450 J | 540 J | 610 JD | 170 J | 1100 J | 1600 J |
| Total Confident Conc. SVOC | | 362,000 | 19,516 | 29,150 | 21,300 | 5,710 | 36,700 | 75,650 |
| Total TICs | | 29,600 | 4,080 | 10,530 | 0 | 6,100 | 5,870 | 8,300 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-18<br>S3753-19<br>07/22/04<br>5.0<br>ug/Kg | SS-19<br>S3754-10<br>07/22/04<br>1.0<br>ug/Kg | SS-20<br>S3754-01<br>07/22/04<br>1.0<br>ug/Kg | SS-21<br>S3754-02<br>07/22/04<br>10.0<br>ug/Kg | SS-22<br>S3754-03<br>07/22/04<br>1.0<br>ug/Kg | SS-23<br>S3754-04<br>07/22/04<br>1.0<br>ug/Kg | SS-24<br>S3754-05<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 190 U | 190 U | 190 U | 1800 U | 190 U | 210 U | 180 U |
| 1,2-Dichlorobenzene | 7,900 | 210 U | 210 U | 210 U | 2000 U | 210 U | 230 U | 200 U |
| 1,3-Dichlorobenzene | 1,600 | 140 U | 140 U | 140 U | 1400 U | 140 U | 150 U | 140 U |
| 1,4-Dichlorobenzene | 8,500 | 160 U | 160 U | 160 U | 1500 U | 160 U | 170 U | 160 U |
| 2,2-oxybis(1-Chloropropane) | | 210 U | 210 U | 200 U | 2000 U | 210 U | 230 U | 200 U |
| N-Nitroso-di-n-propylamine | | 170 U | 170 U | 170 U | 1600 U | 170 U | 180 U | 170 U |
| Hexachloroethane | | 180 U | 190 U | 180 U | 1800 U | 180 U | 200 U | 180 U |
| Nitrobenzene | 200 | 200 U | 200 U | 190 U | 1900 U | 200 U | 210 U | 190 U |
| Isophorone | 4,400 | 140 U | 140 U | 140 U | 1400 U | 140 U | 160 U | 140 U |
| bis(2-Chloroethoxy)methane | | 180 U | 180 U | 170 U | 1700 U | 180 U | 190 U | 170 U |
| 1,2,4-Trichlorobenzene | 3,400 | 110 U | 110 U | 110 U | 1100 U | 110 U | 120 U | 110 U |
| Naphthalene | 13,000 | 84 U | 85 U | 82 U | 810 U | 84 U | 91 U | 82 U |
| 4-Chloroaniline | 220 or MDL | 1400 U | 1400 U | 1400 U | 14000 U | 1400 U | 1500 U | 1400 U |
| Hexachlorobutadiene | | 130 U | 140 U | 130 U | 1300 U | 140 U | 150 U | 130 U |
| 2-Methylnaphthalene | 36,400 | 66 U | 67 U | 65 U | 640 U | 67 U | 72 U | 65 U |
| Hexachlorocyclopentadiene | | 96 U | 98 U | 95 U | 930 U | 97 U | 100 U | 94 U |
| 2-Chloronaphthalene | | 80 U | 81 U | 79 U | 770 U | 81 U | 87 U | 78 U |
| 2-Nitroaniline | 430 or MDL | 140 U | 140 U | 140 U | 1300 U | 140 U | 150 U | 140 U |
| Dimethylphthalate | 2,000 | 92 U | 93 U | 90 U | 880 U | 92 U | 100 U | 90 U |
| Acenaphthylene | 41,000 | 120 U | 120 U | 110 U | 1100 U | 120 U | 130 U | 110 U |
| 2,6-Dinitrotoluene | 1,000 | 160 U | 170 U | 160 U | 1600 U | 160 U | 180 U | 160 U |
| 3-Nitroaniline | 500 or MDL | 620 U | 630 U | 610 U | 6000 U | 620 U | 680 U | 610 U |
| Acenaphthene | 50,000** | 85 U | 86 U | 83 U | 820 U | 85 U | 92 U | 83 U |
| Dibenzofuran | 6,200 | 130 U | 130 U | 120 U | 1200 U | 130 U | 140 U | 120 U |
| 2,4-Dinitrotoluene | | 77 U | 78 U | 75 U | 740 U | 77 U | 83 U | 75 U |
| Diethylphthalate | 71,000 | 120 U | 120 U | 120 U | 1200 U | 120 U | 130 U | 120 U |
| 4-Chlorophenyl-phenylether | | 95 U | 97 U | 94 U | 920 U | 96 U | 100 U | 93 U |
| Fluorene | 50,000** | 110 U | 110 U | 110 U | 1100 U | 110 U | 120 U | 110 U |
| 4-Nitroaniline | | 300 U | 310 U | 300 U | 2900 U | 300 U | 330 U | 290 U |
| N-Nitrosodiphenylamine | | 98 U | 99 U | 96 U | 940 U | 98 U | 110 U | 95 U |
| 4-Bromophenyl-phenylether | | 100 U | 100 U | 99 U | 970 U | 100 U | 110 U | 99 U |
| Hexachlorobenzene | 410 | 72 U | 73 U | 71 U | 690 U | 72 U | 78 U | 70 U |
| Phenanthrene | 50,000** | 630 J | 610 J | 500 J | 830 U | 820 J | 94 U | 420 J |
| Anthracene | 50,000** | 92 U | 93 U | 90 U | 880 U | 92 U | 100 U | 90 U |
| Carbazole | | 85 U | 86 U | 83 U | 820 U | 85 U | 92 U | 83 U |
| Di-n-butylphthalate | 8,100 | 51 U | 52 U | 50 U | 490 U | 51 U | 56 U | 50 U |
| Fluoranthene | 50,000** | 1500 J | 1500 J | 1100 J | 3900 J | 1300 J | 660 J | 630 J |
| Pyrene | 50,000** | 1300 J | 1400 J | 1100 J | 3800 J | 1300 J | 700 J | 670 J |
| Butylbenzylphthalate | 50,000** | 130 U | 130 U | 130 U | 1200 U | 130 U | 140 U | 130 U |
| 3,3-Dichlorobenzidine | | 620 U | 630 U | 610 U | 5900 U | 620 U | 670 U | 600 U |
| Benzo(a)anthracene | 224 or MDL | 950 J | 740 J | 640 J | 560 U | 630 J | 63 U | 57 U |
| Chrysene | 400 | 840 J | 900 J | 630 J | 1200 U | 670 J | 130 U | 120 U |
| bis(2-Ethylhexyl)phthalate | 50,000** | 88 U | 90 U | 87 U | 850 U | 89 U | 96 U | 86 U |
| Di-n-octyl phthalate | 50,000** | 92 U | 93 U | 90 U | 880 U | 92 U | 100 U | 90 U |
| Benzo(b)fluoranthene | 1,100 | 1200 J | 770 J | 700 J | 3800 J | 670 J | 220 U | 200 U |
| Benzo(k)fluoranthene | 1,100 | 540 J | 540 J | 500 J | 1300 U | 130 U | 140 U | 130 U |
| Benzo(a)pyrene | 61 or MDL | 800 J | 720 J | 600 J | 640 U | 510 J | 72 U | 65 U |
| Indeno(1,2,3-cd)pyrene | 3,200 | 93 U | 540 J | 91 U | 900 U | 93 U | 100 U | 91 U |
| Dibenz(a,h)anthracene | 14 or MDL | 110 U | 110 U | 110 U | 1100 U | 110 U | 120 U | 110 U |
| Benzo(g,h,i)perylene | 50,000** | 170 U | 510 J | 160 U | 1600 U | 170 U | 180 U | 160 U |
| Total Confident Conc. SVOC | | 7,760 | 8,230 | 5,770 | 11,500 | 5,900 | 1,360 | 1,720 |
| Total TICs | | 3,890 | 5,720 | 12,830 | 0 | 2,570 | 7,000 | 20,900 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-25<br>S3754-06<br>07/22/04<br>1.0<br>ug/Kg | SS-26<br>S3753-20<br>07/22/04<br>1.0<br>ug/Kg | SS-27<br>S3754-07<br>07/22/04<br>10.0<br>ug/Kg | SS-28<br>S3754-08<br>07/22/04<br>10.0<br>ug/Kg | SS-29<br>S3754-09<br>07/22/04<br>2.0<br>ug/Kg |
|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 170 U | 40 U | 2100 U | 1800 U | 360 U |
| 1,2-Dichlorobenzene | 7,900 | 180 U | 44 U | 2300 U | 2000 U | 400 U |
| 1,3-Dichlorobenzene | 1,600 | 120 U | 30 U | 1500 U | 1300 U | 270 U |
| 1,4-Dichlorobenzene | 8,500 | 140 U | 34 U | 1700 U | 1500 U | 310 U |
| 2,2-oxybis(1-Chloropropane) | | 180 U | 44 U | 2300 U | 1900 U | 400 U |
| N-Nitroso-di-n-propylamine | | 150 U | 36 U | 1800 U | 1600 U | 320 U |
| Hexachloroethane | | 160 U | 39 U | 2000 U | 1700 U | 350 U |
| Nitrobenzene | 200 | 170 U | 41 U | 2100 U | 1800 U | 370 U |
| Isophorone | 4,400 | 130 U | 30 U | 1500 U | 1300 U | 270 U |
| bis(2-Chloroethoxy)methane | | 150 U | 37 U | 1900 U | 1600 U | 340 U |
| 1,2,4-Trichlorobenzene | 3,400 | 97 U | 23 U | 1200 U | 1000 U | 210 U |
| Naphthalene | 13,000 | 74 U | 250 J | 910 U | 780 U | 160 U |
| 4-Chloroaniline | 220 or MDL | 1300 U | 300 U | 15000 U | 13000 U | 2700 U |
| Hexachlorobutadiene | | 120 U | 29 U | 1500 U | 1300 U | 260 U |
| 2-Methylnaphthalene | 36,400 | 58 U | 310 J | 720 U | 620 U | 130 U |
| Hexachlorocyclopentadiene | | 85 U | 20 U | 1000 U | 900 U | 180 U |
| 2-Chloronaphthalene | | 71 U | 17 U | 870 U | 750 U | 150 U |
| 2-Nitroaniline | 430 or MDL | 120 U | 30 U | 1500 U | 1300 U | 270 U |
| Dimethylphthalate | 2,000 | 81 U | 19 U | 990 U | 860 U | 180 U |
| Acenaphthylene | 41,000 | 100 U | 130 J | 8000 J | 1100 U | 220 U |
| 2,6-Dinitrotoluene | 1,000 | 140 U | 35 U | 1800 U | 1500 U | 310 U |
| 3-Nitroaniline | 500 or MDL | 550 U | 130 U | 6700 U | 5800 U | 1200 U |
| Acenaphthene | 50,000** | 75 U | 18 U | 920 U | 790 U | 160 U |
| Dibenzofuran | 6,200 | 110 U | 110 J | 1400 U | 1200 U | 240 U |
| 2,4-Dinitrotoluene | | 67 U | 16 U | 830 U | 720 U | 150 U |
| Diethylphthalate | 71,000 | 110 U | 26 U | 1300 U | 1100 U | 230 U |
| 4-Chlorophenyl-phenylether | | 84 U | 20 U | 1000 U | 890 U | 180 U |
| Fluorene | 50,000** | 96 U | 23 U | 1200 U | 1000 U | 210 U |
| 4-Nitroaniline | | 260 U | 64 U | 3300 U | 2800 U | 580 U |
| N-Nitrosodiphenylamine | | 86 U | 21 U | 1100 U | 910 U | 190 U |
| 4-Bromophenyl-phenylether | | 89 U | 21 U | 1100 U | 940 U | 190 U |
| Hexachlorobenzene | 410 | 63 U | 15 U | 780 U | 670 U | 140 U |
| Phenanthrene | 50,000** | 76 U | 1200 | 92000 | 4200 J | 160 U |
| Anthracene | 50,000** | 81 U | 170 J | 18000 J | 860 U | 180 U |
| Carbazole | | 75 U | 120 J | 920 U | 790 U | 160 U |
| Di-n-butylphthalate | 8,100 | 45 U | 11 U | 550 U | 480 U | 98 U |
| Fluoranthene | 50,000** | 47 U | 1900 | 320000 | 12000 J | 100 U |
| Pyrene | 50,000** | 60 U | 1400 | 260000 | 11000 J | 130 U |
| Butylbenzylphthalate | 50,000** | 110 U | 27 U | 1400 U | 1200 U | 250 U |
| 3,3-Dichlorobenzidine | | 540 U | 130 U | 6700 U | 5800 U | 1200 U |
| Benzo(a)anthracene | 224 or MDL | 51 U | 660 J | 150000 | 7300 J | 110 U |
| Chrysene | 400 | 110 U | 790 J | 130000 | 7400 J | 230 U |
| bis(2-Ethylhexyl)phthalate | 50,000** | 78 U | 19 U | 960 U | 820 U | 170 U |
| Di-n-octyl phthalate | 50,000** | 81 U | 19 U | 990 U | 860 U | 180 U |
| Benzo(b)fluoranthene | 1,100 | 180 U | 1200 J | 180000 J | 8100 J | 390 U |
| Benzo(k)fluoranthene | 1,100 | 120 U | 470 J | 64000 | 6800 J | 250 U |
| Benzo(a)pyrene | 61 or MDL | 58 U | 460 J | 100000 | 6800 J | 130 U |
| Indeno(1,2,3-cd)pyrene | 3,200 | 82 U | 160 J | 16000 J | 870 U | 180 U |
| Dibenz(a,h)anthracene | 14 or MDL | 99 U | 24 U | 1200 U | 1100 U | 220 U |
| Benzo(g,h,i)perylene | 50,000** | 150 U | 200 J | 25000 J | 3900 J | 320 U |
| Total Confident Conc. SVOC | | 0 | 9,530 | 1,363,000 | 67,500 | 0 |
| Total TICs | | 0 | 13,530 | 265,000 | 70,000 | 0 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br><br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-1<br>S3753-01<br>07/22/04<br>1.0<br>ug/Kg | SS-2<br>S3753-02<br>07/22/04<br>1.0<br>ug/Kg | SS-3<br>S3753-03<br>07/22/04<br>1.0<br>ug/Kg | SS-4<br>S3753-04<br>07/22/04<br>1.0<br>ug/Kg | SS-5<br>S3753-05<br>07/22/04<br>1.0<br>ug/Kg | SS-5DL<br>S3753-05DL<br>07/22/04<br>10.0<br>ug/Kg | SS-6<br>S3753-06<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| **Aroclor-1016** | 1,000 | 6.1 U | 5.7 U | 5.7 U | 5.9 U | 7.4 U | 74 UD | 6.4 U |
| **Aroclor-1221** | 1,000 | 4.1 U | 3.9 U | 3.9 U | 4.0 U | 5.0 U | 50 UD | 4.4 U |
| **Aroclor-1232** | 1,000 | 2.8 U | 2.6 U | 2.6 U | 2.7 U | 3.4 U | 34 UD | 3.0 U |
| **Aroclor-1242** | 1,000 | 3.6 U | 3.4 U | 3.4 U | 3.5 U | 4.4 U | 44 UD | 3.8 U |
| **Aroclor-1248** | 1,000 | 4.3 U | 4.0 U | 4.0 U | 4.1 U | 5.2 U | 52 UD | 4.5 U |
| **Aroclor-1254** | 1,000 | 1.6 U | 1.5 U | 1.5 U | 1.5 U | 1.9 U | 19 UD | 1.7 U |
| **Aroclor-1260** | 1,000 | 3.4 U | 3.2 U | 3.2 U | 3.3 U | 1200 EJ | 1000 D | 1700 EJ |
| **Units**<br>**COMPOUND** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | | **mg/Kg** |
| **Arsenic** | 7.5 or SB/(5.89) | 15.6 | 7.430 | 11.5 | 24.8 | 4.890 | | 9.240 |
| **Barium** | 300 or SB/(52.5) | 170 | 68.0 | 175 | 85.7 | 127 | | 159 |
| **Cadmium** | 1 or SB/(1.93) | 2.440 | 8.700 | 2.760 | 3.310 | 2.190 | | 2.710 |
| **Chromium** | 10 or SB/(15.8) | 88.7 | 58.2 | 18.2 | 74.3 | 14.6 | | 27.0 |
| **Lead** | SB/(87.9) | 908 J | 78.4 J | 185 J | 414 J | 210 J | | 265 J |
| **Selenium** | 2 or SB/(1.25) | 2.500 | 1.400 | 1.030 J | 3.210 | 2.150 | | 1.100 J |
| **Silver** | SB/(0.117) | 1.120 J | 240 | 0.534 J | 2.070 | 0.149 U | | 0.262 J |
| **Mercury** | 0.1 | 0.40 | 0.13 | 0.11 | 0.18 | 0.34 | | 0.39 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br><br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-6DL<br>S3753-06DL<br>07/22/04<br>10.0<br>ug/Kg | SS-7<br>S3753-07<br>07/22/04<br>1.0<br>ug/Kg | SS-7DL<br>S3753-07DL<br>07/22/04<br>10.0<br>ug/Kg | SS-8<br>S3753-08<br>07/22/04<br>1.0<br>ug/Kg | SS-9<br>S3753-09<br>07/22/04<br>1.0<br>ug/Kg | SS-10<br>S3753-10<br>07/22/04<br>1.0<br>ug/Kg | SS-11<br>S3753-11<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| **Aroclor-1016** | 1,000 | 64 UD | 6.9 U | 69 UD | 6.1 U | 5.9 U | 6.2 U | 6.2 U |
| **Aroclor-1221** | 1,000 | 44 UD | 4.7 U | 47 UD | 4.2 U | 4.0 U | 4.2 U | 4.2 U |
| **Aroclor-1232** | 1,000 | 30 UD | 3.2 U | 32 UD | 2.8 U | 2.7 U | 2.9 U | 2.9 U |
| **Aroclor-1242** | 1,000 | 38 UD | 4.1 U | 41 UD | 3.6 U | 3.5 U | 3.7 U | 3.7 U |
| **Aroclor-1248** | 1,000 | 45 UD | 4.9 U | 49 UD | 4.3 U | 4.1 U | 4.4 U | 4.3 U |
| **Aroclor-1254** | 1,000 | 17 UD | 1.8 U | 18 UD | 1.6 U | 1.5 U | 1.6 U | 1.6 U |
| **Aroclor-1260** | 1,000 | 1500 D | 3600 EJ | 3400 D | 3.4 U | 3.3 U | 3.5 U | 3.5 U |
| **Units**<br>**COMPOUND** | | | **mg/Kg** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** |
| **Arsenic** | 7.5 or SB/(5.89) | | 19.2 | | 8.800 | 9.990 | 10.2 | 6.780 |
| **Barium** | 300 or SB/(52.5) | | 318 | | 70.6 | 134 | 179 | 38.4 |
| **Cadmium** | 1 or SB/(1.93) | | 3.730 | | 2.290 | 2.800 | 2.900 | 2.080 |
| **Chromium** | 10 or SB/(15.8) | | 146 | | 15.4 | 21.3 | 18.9 | 12.6 |
| **Lead** | SB/(87.9) | | 456 J | | 58.8 J | 289 J | 657 J | 25.4 J |
| **Selenium** | 2 or SB/(1.25) | | 2.820 | | 1.860 | 1.140 | 1.760 | 1.130 J |
| **Silver** | SB/(0.117) | | 2.020 | | 0.123 U | 0.119 U | 0.524 J | 0.126 U |
| **Mercury** | 0.1 | | 1.3 | | 0.07 | 0.11 | 0.22 | 0.02 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br><br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-12<br>S3753-12<br>07/22/04<br>1.0<br>ug/Kg | SS-13<br>S3753-13<br>07/22/04<br>1.0<br>ug/Kg | SS-14<br>S3753-14<br>07/22/04<br>1.0<br>ug/Kg | SS-14B<br>S3753-15<br>07/22/04<br>1.0<br>ug/Kg | SS-15<br>S3753-16<br>07/22/04<br>1.0<br>ug/Kg | SS-16<br>S3753-17<br>07/22/04<br>1.0<br>ug/Kg | SS-17<br>S3753-18<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| **Aroclor-1016** | 1,000 | 5.7 U | 5.9 U | 5.5 U | 5.6 U | 6.2 U | 5.5 U | 6.3 U |
| **Aroclor-1221** | 1,000 | 3.9 U | 4.0 U | 3.7 U | 3.8 U | 4.3 U | 3.8 U | 4.3 U |
| **Aroclor-1232** | 1,000 | 2.7 U | 2.7 U | 2.5 U | 2.6 U | 2.9 U | 2.6 U | 2.9 U |
| **Aroclor-1242** | 1,000 | 3.4 U | 3.5 U | 3.2 U | 3.3 U | 3.7 U | 3.3 U | 3.7 U |
| **Aroclor-1248** | 1,000 | 4.0 U | 4.2 U | 3.8 U | 3.9 U | 4.4 U | 3.9 U | 4.4 U |
| **Aroclor-1254** | 1,000 | 1.5 U | 1.5 U | 1.4 U | 1.4 U | 1.6 U | 1.4 U | 1.6 U |
| **Aroclor-1260** | 1,000 | 3.2 U | 3.4 U | 3.1 U | 3.2 U | 3.5 U | 3.1 U | 3.6 U |
| **Units**<br>**COMPOUND** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | | |
| **Arsenic** | 7.5 or SB/(5.89) | 6.770 | 7.340 | 7.550 | 6.570 | 6.580 | 5.070 | 8.840 |
| **Barium** | 300 or SB/(52.5) | 66.1 | 121 | 83.5 | 72.2 | 78.9 | 374 | 164 |
| **Cadmium** | 1 or SB/(1.93) | 2.090 | 1.720 | 2.060 | 1.570 | 2.240 | 1.610 | 2.620 |
| **Chromium** | 10 or SB/(15.8) | 13.2 | 10.9 | 12.8 | 8.790 | 15.3 | 11.3 | 15.2 |
| **Lead** | SB/(87.9) | 80.6 J | 447 J | 166 J | 141 J | 71.6 J | 262 J | 793 J |
| **Selenium** | 2 or SB/(1.25) | 1.060 J | 1.470 | 1.350 | 1.170 | 1.740 | 0.777 J | 1.390 |
| **Silver** | SB/(0.117) | 0.115 U | 0.121 U | 0.112 U | 0.113 U | 0.621 J | 0.113 U | 0.127 U |
| **Mercury** | 0.1 | 0.03 | 0.13 | 0.07 | 0.13 | 0.07 | 0.12 | 0.10 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br><br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-18<br>S3753-19<br>07/22/04<br>1.0<br>ug/Kg | SS-19<br>S3754-10<br>07/22/04<br>1.0<br>ug/Kg | SS-20<br>S3754-01<br>07/22/04<br>1.0<br>ug/Kg | SS-21<br>S3754-02<br>07/22/04<br>1.0<br>ug/Kg | SS-22<br>S3754-03<br>07/22/04<br>1.0<br>ug/Kg | SS-23<br>S3754-04<br>07/22/04<br>1.0<br>ug/Kg | SS-24<br>S3754-05<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|
| Aroclor-1016 | 1,000 | 6.0 U | 6.2 U | 6.0 U | 5.8 U | 6.1 U | 6.5 U | 5.9 U |
| Aroclor-1221 | 1,000 | 4.1 U | 4.2 U | 4.1 U | 3.9 U | 4.2 U | 4.5 U | 4.0 U |
| Aroclor-1232 | 1,000 | 2.8 U | 2.9 U | 2.8 U | 2.7 U | 2.8 U | 3.0 U | 2.7 U |
| Aroclor-1242 | 1,000 | 3.6 U | 3.7 U | 3.5 U | 3.4 U | 3.6 U | 3.9 U | 3.5 U |
| Aroclor-1248 | 1,000 | 4.2 U | 4.3 U | 4.2 U | 4.1 U | 4.3 U | 4.6 U | 4.2 U |
| Aroclor-1254 | 1,000 | 1.6 U | 1.6 U | 1.5 U | 1.5 U | 1.6 U | 1.7 U | 1.5 U |
| Aroclor-1260 | 1,000 | 3.4 U | 140 | 83 | 67 | 290 | 3.7 U | 140 |
| Units<br>COMPOUND | | | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| Arsenic | 7.5 or SB/(5.89) | 8.980 | 21.5 | 9.450 | 8.460 | 15.1 | 8.790 | 8.870 |
| Barium | 300 or SB/(52.5) | 130 | 92.7 | 123 | 57.6 | 80.4 | 51.7 | 62.1 |
| Cadmium | 1 or SB/(1.93) | 2.500 | 2.340 | 2.920 | 2.100 | 2.500 | 3.400 | 2.460 |
| Chromium | 10 or SB/(15.8) | 17.0 | 123 J | 90.0 J | 14.4 J | 24.4 J | 44.9 J | 16.1 J |
| Lead | SB/(87.9) | 273 J | 245 J | 261 J | 73.7 J | 130 J | 139 J | 192 J |
| Selenium | 2 or SB/(1.25) | 0.930 J | 1.140 J | 1.300 | 1.510 | 1.720 | 1.940 | 1.580 |
| Silver | SB/(0.117) | 0.124 U | 0.683 J | 0.120 U | 0.119 U | 0.124 U | 1.130 J | 0.120 U |
| Mercury | 0.1 | 0.08 | 0.57 J | 0.27 J | 0.11 J | 0.11 J | 0.10 J | 0.08 J |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 1. Surficial Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br><br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | SS-25<br>S3754-06<br>07/22/04<br>1.0<br>ug/Kg | SS-26<br>S3753-20<br>07/22/04<br>1.0<br>ug/Kg | SS-27<br>S3754-07<br>07/22/04<br>1.0<br>ug/Kg | SS-28<br>S3754-08<br>07/22/04<br>1.0<br>ug/Kg | SS-29<br>S3754-09<br>07/22/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|
| Aroclor-1016 | 1,000 | 5.3 U | 6.4 U | 6.6 U | 5.6 U | 5.7 U |
| Aroclor-1221 | 1,000 | 3.6 U | 4.4 U | 4.5 U | 3.8 U | 3.9 U |
| Aroclor-1232 | 1,000 | 2.5 U | 3.0 U | 3.0 U | 2.6 U | 2.6 U |
| Aroclor-1242 | 1,000 | 3.2 U | 3.8 U | 3.9 U | 3.3 U | 3.4 U |
| Aroclor-1248 | 1,000 | 3.7 U | 4.5 U | 4.6 U | 3.9 U | 4.0 U |
| Aroclor-1254 | 1,000 | 1.4 U | 1.7 U | 1.7 U | 1.4 U | 1.5 U |
| Aroclor-1260 | 1,000 | 50 PJ | 3.6 U | 99 PJ | 86 | 3.2 U |
| Units<br>COMPOUND | | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| Arsenic | 7.5 or SB/(5.89) | 5.540 | 22.1 | 20.1 | 9.680 | 5.890 |
| Barium | 300 or SB/(52.5) | 15.1 J | 123 | 101 | 41.6 | 52.5 |
| Cadmium | 1 or SB/(1.93) | 0.973 | 2.220 | 3.220 | 2.480 | 1.930 |
| Chromium | 10 or SB/(15.8) | 5.940 J | 627 | 32.7 J | 15.6 J | 15.8 J |
| Lead | SB/(87.9) | 22.8 J | 189 J | 406 J | 138 J | 87.9 J |
| Selenium | 2 or SB/(1.25) | 0.320 U | 3.050 | 2.120 | 0.602 J | 1.250 |
| Silver | SB/(0.117) | 0.107 U | 1.960 | 0.809 J | 0.114 U | 0.117 U |
| Mercury | 0.1 | 0.03 J | 0.18 | 0.27 J | 0.24 J | 0.04 J |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| Volatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-1S-1<br>S3970-01<br>08/02/04<br>1.0<br>ug/Kg | TP-5S-1<br>S3970-02<br>08/02/04<br>1.0<br>ug/Kg | TP-6S-1<br>S3970-03<br>08/02/04<br>1.0<br>ug/Kg | TP-8S-1<br>S3970-04<br>08/03/04<br>1.0<br>ug/Kg | TP-9S-1<br>S3970-05<br>08/03/04<br>1.0<br>ug/Kg | TP-9S-1RE<br>S3970-05RE<br>08/03/04<br>1.0<br>ug/Kg | TP-16S-1<br>S3970-06<br>08/03/04<br>1.0<br>ug/Kg | TP-19S-1<br>S3970-07<br>08/04/04<br>1.0<br>ug/Kg | TP-20S-1<br>S3970-08<br>08/04/04<br>1.0<br>ug/Kg | TP-20S-1RE<br>S3970-08RE<br>08/04/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloromethane | | 110 U | 0.42 U | 0.37 U | 130 U | 0.36 U | 0.36 U | 120 U | 100 U | 0.44 U | 110 U |
| Vinyl Chloride | 200 | 44 U | 0.30 U | 0.26 U | 49 U | 0.26 U | 0.26 U | 45 U | 40 U | 0.31 U | 44 U |
| Bromomethane | | 130 U | 0.90 U | 0.80 U | 140 U | 0.77 U | 0.77 U | 130 U | 120 U | 0.94 U | 130 U |
| Chloroethane | 1,900 | 150 U | 0.66 U | 0.59 U | 160 U | 0.57 U | 0.57 U | 150 U | 130 U | 0.70 U | 150 U |
| 1,1-Dichloroethene | 200 | 53 U | 0.27 U | 0.24 U | 59 U | 0.23 U | 0.23 U | 54 U | 48 U | 0.29 U | 54 U |
| Acetone | 200 | 540 U | 34 J | 8.4 U | 610 U | 8.1 U | 8.1 U | 3500 J | 500 U | 63 | 550 U |
| Carbon Disulfide | 2,700 | 64 U | 0.13 U | 1.6 J | 72 U | 0.11 U | 0.11 U | 66 U | 59 U | 0.13 U | 65 U |
| Methylene Chloride | 100 | 100 U | 4.4 J | 4.5 J | 110 U | 2.6 J | 1.8 J | 110 U | 94 U | 0.91 U | 100 U |
| trans-1,2-Dichloroethene | 300 | 85 U | 0.47 U | 0.42 U | 94 U | 0.40 U | 0.40 U | 87 U | 77 U | 0.49 U | 86 U |
| 1,1-Dichloroethane | 200 | 35 U | 0.45 U | 0.40 U | 40 U | 0.38 U | 0.38 U | 36 U | 32 U | 0.47 U | 36 U |
| 2-Butanone | 300 | 470 U | 2.9 U | 2.6 U | 520 U | 2.5 U | 2.5 U | 480 U | 430 U | 3.0 U | 470 U |
| Carbon Tetrachloride | 600 | 77 U | 0.38 U | 0.33 U | 86 U | 0.32 U | 0.32 U | 79 U | 71 U | 0.40 U | 78 U |
| cis-1,2-Dichloroethene | | 130 U | 0.45 U | 0.40 U | 140 U | 0.38 U | 0.38 U | 130 U | 120 U | 0.47 U | 130 U |
| Chloroform | 300 | 95 U | 0.30 U | 0.27 U | 110 U | 0.26 U | 0.26 U | 97 U | 87 U | 0.32 U | 96 U |
| 1,1,1-Trichloroethane | 800 | 67 U | 0.34 U | 0.30 U | 75 U | 0.29 U | 0.29 U | 69 U | 61 U | 0.36 U | 68 U |
| Benzene | 60 | 40 U | 0.26 U | 0.23 U | 44 U | 0.22 U | 0.22 U | 2300 | 36 U | 0.27 U | 40 U |
| 1,2-Dichloroethane | 100 | 53 U | 3.9 U | 3.5 U | 59 U | 3.3 U | 3.3 U | 54 U | 48 U | 4.1 U | 53 U |
| Trichloroethene | 700 | 110 U | 0.41 U | 0.36 U | 120 U | 0.35 U | 0.35 U | 110 U | 100 U | 0.43 U | 110 U |
| 1,2-Dichloropropane | | 52 U | 0.42 U | 0.38 U | 58 U | 0.36 U | 0.36 U | 54 U | 48 U | 0.45 U | 53 U |
| Bromodichloromethane | | 57 U | 0.42 U | 0.37 U | 64 U | 0.36 U | 0.36 U | 59 U | 52 U | 0.44 U | 58 U |
| 4-Methyl-2-Pentanone | 1,000 | 220 U | 3.0 U | 2.7 U | 240 U | 2.6 U | 2.6 U | 220 U | 200 U | 3.2 U | 220 U |
| Toluene | 1,500 | 64 U | 0.33 U | 0.29 U | 290 J | 3.2 J | 2.8 J | 150 J | 200 J | 0.35 U | 64 U |
| t-1,3-Dichloropropene | | 70 U | 0.32 U | 0.29 U | 78 U | 0.28 U | 0.28 U | 72 U | 64 U | 0.34 U | 71 U |
| cis-1,3-Dichloropropene | | 25 U | 0.25 U | 0.22 U | 28 U | 0.21 U | 0.21 U | 26 U | 23 U | 0.26 U | 25 U |
| 1,1,2-Trichloroethane | | 85 U | 0.64 U | 0.57 U | 95 U | 0.55 U | 0.55 U | 87 U | 78 U | 0.67 U | 86 U |
| 2-Hexanone | | 110 U | 4.0 U | 3.6 U | 120 U | 3.5 U | 3.5 U | 110 U | 99 U | 4.3 U | 110 U |
| Dibromochloromethane | | 62 U | 0.37 U | 0.33 U | 69 U | 0.32 U | 0.32 U | 64 U | 57 U | 0.39 U | 63 U |
| Tetrachloroethene | 1,400 | 54 U | 0.80 U | 0.71 U | 61 U | 0.69 U | 0.69 U | 56 U | 50 U | 9.6 | 55 U |
| Chlorobenzene | 1,700 | 61 U | 0.45 U | 0.40 U | 68 U | 0.38 U | 0.38 U | 13000 | 55 U | 0.47 U | 61 U |
| Ethyl Benzene | 5,500 | 67 U | 0.32 U | 0.28 U | 530 J | 0.27 U | 0.27 U | 69 U | 420 J | 0.33 U | 68 U |
| m/p-Xylenes | 1,200 | 560 J | 0.65 U | 1.1 J | 4900 | 3.3 J | 2.8 J | 160 U | 1200 J | 0.69 U | 160 U |
| o-Xylene | 1,200 | 60 U | 0.55 U | 0.49 U | 610 J | 0.47 U | 0.47 J | 62 U | 1300 | 0.58 U | 61 U |
| Styrene | | 56 U | 0.40 U | 0.35 U | 63 U | 0.34 U | 0.34 U | 58 U | 52 U | 0.42 U | 57 U |
| Bromoform | | 41 U | 0.38 U | 0.34 U | 46 U | 0.32 U | 0.32 U | 43 U | 38 U | 0.40 U | 42 U |
| 1,1,2,2-Tetrachloroethane | 600 | 81 U | 0.67 U | 0.59 U | 91 U | 0.57 U | 0.57 U | 84 U | 75 U | 0.71 U | 83 U |
| Total Confident Conc. VOC | | 560 | 38.4 | 7.2 | 6330 | 9.1 | 7.4 | 18950 | 3120 | 72.6 | 0 |
| Total TICs | | 22400 | 0 | 385 | 235000 | 299 | 0 | 101300 | 99700 | 4140 | 0 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| Volatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-23S-1<br>S3970-09<br>08/04/04<br>1.0<br>ug/Kg | TP-24S-1<br>S3970-10<br>08/04/04<br>1.0<br>ug/Kg | TP-28S-1<br>S4063-01<br>08/08/04<br>1.0<br>ug/Kg | TP-30S-1<br>S4063-02<br>08/08/04<br>10.0<br>ug/Kg | TP-34S-1<br>S4063-03<br>08/08/04<br>1.0<br>ug/Kg | TP-35S-1<br>S4063-04<br>08/08/04<br>1.0<br>ug/Kg | TP-37S-1<br>S4063-05<br>08/06/04<br>5.0<br>ug/Kg | TP-38S-1<br>S4063-06<br>08/06/04<br>1.0<br>ug/Kg | TP-39S-1<br>S4063-07<br>08/06/04<br>1.0<br>ug/Kg | TP-41S-1<br>S4063-08<br>08/06/04<br>1.0<br>ug/Kg | TP-42S-1<br>S4063-09<br>08/06/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloromethane | | 120 U | 0.48 U | 0.40 U | 3.9 U | 0.39 U | 0.41 U | 2.0 U | 0.43 U | 0.39 U | 0.42 U | 0.41 U |
| Vinyl Chloride | 200 | 46 U | 0.34 U | 0.28 U | 2.8 U | 0.28 U | 0.29 U | 1.4 U | 0.31 U | 0.28 U | 0.30 U | 0.29 U |
| Bromomethane | | 130 U | 1.0 U | 0.85 U | 8.4 U | 0.83 U | 0.87 U | 4.3 U | 0.92 U | 0.83 U | 0.91 U | 0.87 U |
| Chloroethane | 1,900 | 150 U | 0.76 U | 0.63 U | 6.2 U | 0.62 U | 0.65 U | 3.2 U | 0.68 U | 0.62 U | 0.67 U | 0.65 U |
| 1,1-Dichloroethene | 200 | 55 U | 0.31 U | 0.26 U | 2.6 U | 0.25 U | 0.27 U | 1.3 U | 0.28 U | 0.25 U | 0.28 U | 0.27 U |
| Acetone | 200 | 570 U | 100 | 9.0 U | 270 J | 8.8 U | 9.2 U | 250 J | 61 J | 8.8 U | 9.6 U | 9.2 U |
| Carbon Disulfide | 2,700 | 67 U | 5.2 J | 0.12 U | 1.2 U | 0.12 U | 0.12 U | 56 | 0.13 U | 0.12 U | 0.13 U | 0.12 U |
| Methylene Chloride | 100 | 110 U | 4.3 J | 0.82 U | 8.1 U | 0.80 U | 0.84 U | 4.1 U | 0.88 U | 0.80 U | 0.87 U | 0.84 U |
| trans-1,2-Dichloroethene | 300 | 88 U | 0.54 U | 0.45 U | 4.4 U | 0.44 U | 0.46 U | 2.3 U | 0.48 U | 0.44 U | 0.48 U | 0.46 U |
| 1,1-Dichloroethane | 200 | 37 U | 0.51 U | 0.43 U | 4.2 U | 0.42 U | 0.44 U | 2.2 U | 0.46 U | 0.42 U | 0.45 U | 0.44 U |
| 2-Butanone | 300 | 480 U | 16 J | 2.7 U | 27 U | 2.7 U | 2.8 U | 14 U | 3.0 U | 2.7 U | 2.9 U | 2.8 U |
| Carbon Tetrachloride | 600 | 80 U | 0.43 U | 0.36 U | 3.5 U | 0.35 U | 0.37 U | 1.8 U | 0.39 U | 0.35 U | 0.38 U | 0.37 U |
| cis-1,2-Dichloroethene | | 130 U | 0.51 U | 0.42 U | 4.2 U | 0.41 U | 0.43 U | 2.1 U | 0.46 U | 0.41 U | 0.45 U | 0.43 U |
| Chloroform | 300 | 98 U | 0.34 U | 0.29 U | 2.8 U | 0.28 U | 0.29 U | 1.4 U | 0.31 U | 0.28 U | 0.30 U | 0.29 U |
| 1,1,1-Trichloroethane | 800 | 70 U | 0.39 U | 0.33 U | 3.2 U | 0.32 U | 0.33 U | 1.7 U | 0.35 U | 0.32 U | 0.35 U | 0.33 U |
| Benzene | 60 | 41 U | 0.29 U | 0.24 U | 43 J | 0.24 U | 0.25 U | 1.2 U | 0.26 U | 0.24 U | 0.26 U | 0.25 U |
| 1,2-Dichloroethane | 100 | 55 U | 4.5 U | 3.7 U | 37 U | 3.6 U | 3.8 U | 19 U | 4.0 U | 3.6 U | 3.9 U | 3.8 U |
| Trichloroethene | 700 | 110 U | 0.46 U | 0.39 U | 3.8 U | 0.38 U | 0.40 U | 2.0 U | 0.42 U | 0.38 U | 0.41 U | 0.40 U |
| 1,2-Dichloropropane | | 54 U | 0.49 U | 0.40 U | 4.0 U | 0.39 U | 0.41 U | 2.0 U | 0.44 U | 0.39 U | 0.43 U | 0.41 U |
| Bromodichloromethane | | 60 U | 0.48 U | 0.40 U | 4.0 U | 0.39 U | 0.41 U | 2.0 U | 0.43 U | 0.39 U | 0.43 U | 0.41 U |
| 4-Methyl-2-Pentanone | 1,000 | 230 U | 3.5 U | 2.9 U | 29 U | 2.8 U | 3.0 U | 15 U | 3.1 U | 2.8 U | 3.1 U | 3.0 U |
| Toluene | 1,500 | 66 U | 0.38 U | 0.31 U | 320 | 0.30 U | 0.32 U | 1.6 U | 0.34 U | 0.30 U | 0.33 U | 0.32 U |
| t-1,3-Dichloropropene | | 73 U | 0.37 U | 0.31 U | 3.0 U | 0.30 U | 0.32 U | 1.6 U | 0.33 U | 0.30 U | 0.33 U | 0.32 U |
| cis-1,3-Dichloropropene | | 26 U | 0.28 U | 0.23 U | 2.3 U | 0.23 U | 0.24 U | 1.2 U | 0.25 U | 0.23 U | 0.25 U | 0.24 U |
| 1,1,2-Trichloroethane | | 89 U | 0.73 U | 0.61 U | 6.0 U | 0.60 U | 0.62 U | 3.1 U | 0.66 U | 0.60 U | 0.65 U | 0.62 U |
| 2-Hexanone | | 110 U | 4.6 U | 3.9 U | 38 U | 3.8 U | 3.9 U | 19 U | 4.2 U | 3.8 U | 4.1 U | 3.9 U |
| Dibromochloromethane | | 65 U | 0.42 U | 0.35 U | 3.5 U | 0.34 U | 0.36 U | 1.8 U | 0.38 U | 0.34 U | 0.37 U | 0.36 U |
| Tetrachloroethene | 1,400 | 57 U | 0.92 U | 0.77 U | 110 | 0.75 U | 9.3 | 3.9 U | 11 | 0.75 U | 5.0 J | 4.1 J |
| Chlorobenzene | 1,700 | 63 U | 0.51 U | 0.42 U | 4.2 U | 0.41 U | 0.43 U | 2.1 U | 0.46 U | 0.41 U | 0.45 U | 0.43 U |
| Ethyl Benzene | 5,500 | 70 U | 0.36 U | 0.30 U | 350 | 0.29 U | 0.31 U | 1.5 U | 0.32 U | 0.29 U | 0.32 U | 3.5 J |
| m/p-Xylenes | 1,200 | 170 U | 0.74 U | 0.62 U | 970 | 0.60 U | 0.63 U | 3.1 U | 0.67 U | 0.60 U | 0.66 U | 3.1 J |
| o-Xylene | 1,200 | 63 U | 0.63 U | 0.52 U | 1100 | 0.51 U | 0.53 U | 2.6 U | 0.56 U | 0.51 U | 0.55 U | 2.6 J |
| Styrene | | 59 U | 0.45 U | 0.38 U | 3.7 U | 0.37 U | 0.39 U | 1.9 U | 0.41 U | 0.37 U | 0.40 U | 0.39 U |
| Bromoform | | 43 U | 0.43 U | 0.36 U | 3.6 U | 0.35 U | 0.37 U | 1.8 U | 0.39 U | 0.35 U | 0.38 U | 0.37 U |
| 1,1,2,2-Tetrachloroethane | 600 | 85 U | 0.77 U | 0.64 U | 6.3 U | 0.62 U | 0.65 U | 3.2 U | 0.69 U | 0.62 U | 0.68 U | 0.65 U |
| Total Confident Conc. VOC | | 0 | 125.5 | 0 | 3163 | 0 | 9.3 | 306 | 72 | 0 | 5 | 13.3 |
| Total TICs | | 103700 | 0 | 0 | 22400 | 3551 | 2460 | 13520 | 2000 | 1980 | 7320 | 225 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| Volatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | AT-7S-1<br>S3897-01<br>07/29/04<br>1.0<br>ug/Kg | B-7(14-16)<br>S4313-01<br>08/18/04<br>10.0<br>ug/Kg | B-7(14-16)RE<br>S4313-01RE<br>08/18/04<br>10.0<br>ug/Kg | TRIPBLANK<br>S4063-10<br>08/08/04<br>1.0<br>ug/L |
|---|---|---|---|---|---|
| Chloromethane | | 0.38 U | 3.9 U | 3.9 U | 0.68 U |
| Vinyl Chloride | 200 | 0.27 U | 2.8 U | 2.8 U | 0.27 U |
| Bromomethane | | 0.82 U | 8.4 U | 8.4 U | 0.78 U |
| Chloroethane | 1,900 | 0.61 U | 6.2 U | 6.2 U | 0.88 U |
| 1,1-Dichloroethene | 200 | 0.25 U | 2.6 U | 2.6 U | 0.32 U |
| Acetone | 200 | 8.7 U | 420 | 360 | 3.3 U |
| Carbon Disulfide | 2,700 | 0.12 U | 1.2 U | 1.2 U | 0.39 U |
| Methylene Chloride | 100 | 0.79 U | 67 | 48 J | 0.62 U |
| trans-1,2-Dichloroethene | 300 | 0.43 U | 4.4 U | 4.4 U | 0.51 U |
| 1,1-Dichloroethane | 200 | 0.41 U | 4.2 U | 4.2 U | 0.22 U |
| 2-Butanone | 300 | 2.6 U | 27 U | 27 U | 2.8 U |
| Carbon Tetrachloride | 600 | 0.35 U | 3.5 U | 3.5 U | 0.47 U |
| cis-1,2-Dichloroethene | | 0.41 U | 4.2 U | 4.2 U | 0.77 U |
| Chloroform | 300 | 0.28 U | 2.8 U | 2.8 U | 0.58 U |
| 1,1,1-Trichloroethane | 800 | 0.32 U | 3.2 U | 3.2 U | 0.41 U |
| Benzene | 60 | 0.23 U | 2.4 U | 2.4 U | 0.24 U |
| 1,2-Dichloroethane | 100 | 3.6 U | 37 U | 37 U | 0.32 U |
| Trichloroethene | 700 | 0.37 U | 3.8 U | 3.8 U | 0.67 U |
| 1,2-Dichloropropane | | 0.39 U | 4.0 U | 4.0 U | 0.63 U |
| Bromodichloromethane | | 0.39 U | 4.0 U | 4.0 U | 0.35 U |
| 4-Methyl-2-Pentanone | 1,000 | 2.8 U | 29 U | 29 U | 1.3 U |
| Toluene | 1,500 | 0.30 U | 3.1 U | 3.1 U | 0.39 U |
| t-1,3-Dichloropropene | | 0.30 U | 3.0 U | 3.0 U | 0.42 U |
| cis-1,3-Dichloropropene | | 0.23 U | 2.3 U | 2.3 U | 0.15 U |
| 1,1,2-Trichloroethane | | 0.59 U | 6.0 U | 6.0 U | 0.52 U |
| 2-Hexanone | | 3.7 U | 38 U | 38 U | 0.66 U |
| Dibromochloromethane | | 0.34 U | 3.5 U | 3.5 U | 0.38 U |
| Tetrachloroethene | 1,400 | 0.74 U | 7.6 U | 7.6 U | 0.33 U |
| Chlorobenzene | 1,700 | 0.41 U | 4.2 U | 4.2 U | 0.37 U |
| Ethyl Benzene | 5,500 | 0.29 U | 3.0 U | 3.0 U | 0.41 U |
| m/p-Xylenes | 1,200 | 0.60 U | 55 J | 26 J | 0.96 U |
| o-Xylene | 1,200 | 0.50 U | 5.1 U | 5.1 U | 0.37 U |
| Styrene | | 0.36 U | 3.7 U | 3.7 U | 0.34 U |
| Bromoform | | 0.35 U | 3.6 U | 3.6 U | 0.25 U |
| 1,1,2,2-Tetrachloroethane | 600 | 0.62 U | 6.3 U | 6.3 U | 0.50 U |
| Total Confident Conc. VOC | | 0 | 542 | 434 | 0 |
| Total TICs | | 18 | 16860 | 0 | |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-1S-1<br>S3970-01<br>08/02/04<br>1.0<br>ug/Kg | TP-1S-1RE<br>S3970-01RE<br>08/02/04<br>1.0<br>ug/Kg | TP-5S-1<br>S3970-02<br>08/02/04<br>1.0<br>ug/Kg | TP-6S-1<br>S3970-03<br>08/02/04<br>1.0<br>ug/Kg | TP-6S-1DL<br>S3970-03DL<br>08/02/04<br>5.0<br>ug/Kg | TP-8S-1<br>S3970-04<br>08/03/04<br>1.0<br>ug/Kg | TP-8S-1RE<br>S3970-04RE<br>08/03/04<br>1.0<br>ug/Kg | TP-9S-1<br>S3970-05<br>08/03/04<br>1.0<br>ug/Kg | TP-9S-1RE<br>S3970-05RE<br>08/03/04<br>1.0<br>ug/Kg | TP-16S-1<br>S3970-06<br>08/03/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 21 U | 21 U | 20 U | 36 U | 180 UD | 48 U | 48 U | 180 U | 180 U | 220 U |
| 1,2-Dichlorobenzene | 7,900 | 23 U | 23 U | 22 U | 40 U | 200 UD | 53 U | 53 U | 190 U | 190 U | 240 U |
| 1,3-Dichlorobenzene | 1,600 | 16 U | 16 U | 15 U | 27 U | 140 UD | 36 U | 36 U | 130 U | 130 U | 160 U |
| 1,4-Dichlorobenzene | 8,500 | 18 U | 18 U | 17 U | 31 U | 150 UD | 40 U | 40 U | 150 U | 150 U | 180 U |
| 2,2-oxybis(1-Chloropropane) | | 23 U | 23 U | 22 U | 40 U | 200 UD | 53 U | 53 U | 190 U | 190 U | 240 U |
| N-Nitroso-di-n-propylamine | | 19 U | 19 U | 18 U | 32 U | 160 UD | 43 U | 43 U | 160 U | 160 U | 200 U |
| Hexachloroethane | | 21 U | 21 U | 20 U | 35 U | 180 UD | 46 U | 46 U | 170 U | 170 U | 210 U |
| Nitrobenzene | 200 | 22 U | 22 U | 21 U | 37 U | 190 UD | 49 U | 49 U | 180 U | 180 U | 220 U |
| Isophorone | 4,400 | 16 U | 16 U | 15 U | 27 U | 140 UD | 36 U | 36 U | 130 U | 130 U | 160 U |
| bis(2-Chloroethoxy)methane | | 20 U | 20 U | 19 U | 33 U | 170 UD | 44 U | 44 U | 160 U | 160 U | 200 U |
| 1,2,4-Trichlorobenzene | 3,400 | 12 U | 12 U | 12 U | 21 U | 110 UD | 28 U | 28 U | 100 U | 100 U | 130 U |
| Naphthalene | 13,000 | 9.4 U | 9.4 U | 91 J | 16 U | 80 UD | 320 J | 340 J | 78 U | 78 U | 96 U |
| 4-Chloroaniline | 220 or MDL | 160 U | 160 U | 150 U | 270 U | 1400 UD | 360 U | 360 U | 1300 U | 1300 U | 1600 U |
| Hexachlorobutadiene | | 15 U | 15 U | 14 U | 26 U | 130 UD | 34 U | 34 U | 130 U | 130 U | 160 U |
| 2-Methylnaphthalene | 36,400 | 57 J | 54 J | 7.1 U | 13 U | 63 UD | 130 J | 130 J | 62 U | 62 U | 76 U |
| Hexachlorocyclopentadiene | | 11 U | 11 U | 10 U | 18 U | 92 UD | 24 U | 24 U | 90 U | 90 U | 110 U |
| 2-Chloronaphthalene | | 9.0 U | 9.0 U | 8.6 U | 15 U | 76 UD | 20 U | 20 U | 75 U | 75 U | 92 U |
| 2-Nitroaniline | 430 or MDL | 16 U | 16 U | 15 U | 27 U | 130 UD | 35 U | 35 U | 130 U | 130 U | 160 U |
| Dimethylphthalate | 2,000 | 10 U | 10 U | 9.9 U | 18 U | 88 UD | 23 U | 23 U | 85 U | 85 U | 110 U |
| Acenaphthylene | 41,000 | 13 U | 13 U | 12 U | 850 | 640 JD | 300 J | 350 J | 110 U | 110 U | 130 U |
| 2,6-Dinitrotoluene | 1,000 | 18 U | 18 U | 18 U | 31 U | 160 UD | 41 U | 41 U | 150 U | 150 U | 190 U |
| 3-Nitroaniline | 500 or MDL | 70 U | 70 U | 67 U | 120 U | 590 UD | 160 U | 160 U | 580 U | 580 U | 710 U |
| Acenaphthene | 50,000** | 9.5 U | 9.5 U | 9.1 U | 16 U | 81 UD | 780 J | 760 J | 79 U | 79 U | 98 U |
| Dibenzofuran | 6,200 | 14 U | 14 U | 59 J | 24 U | 120 UD | 150 J | 160 J | 120 U | 120 U | 150 U |
| 2,4-Dinitrotoluene | | 8.6 U | 8.6 U | 8.2 U | 15 U | 73 UD | 19 U | 19 U | 71 U | 71 U | 88 U |
| Diethylphthalate | 71,000 | 14 U | 14 U | 13 U | 23 U | 120 UD | 31 U | 31 U | 110 U | 110 U | 140 U |
| 4-Chlorophenyl-phenylether | | 11 U | 11 U | 10 U | 18 U | 91 UD | 24 U | 24 U | 89 U | 89 U | 110 U |
| Fluorene | 50,000** | 49 J | 48 J | 68 J | 190 J | 100 UD | 910 J | 830 J | 100 U | 100 U | 130 U |
| 4-Nitroaniline | | 34 U | 34 U | 32 U | 57 U | 290 UD | 76 U | 76 U | 280 U | 280 U | 350 U |
| N-Nitrosodiphenylamine | | 11 U | 11 U | 10 U | 19 U | 93 UD | 25 U | 25 U | 91 U | 91 U | 110 U |
| 4-Bromophenyl-phenylether | | 11 U | 11 U | 11 U | 19 U | 96 UD | 26 U | 26 U | 94 U | 94 U | 120 U |
| Hexachlorobenzene | 410 | 8.1 U | 8.1 U | 7.7 U | 14 U | 69 UD | 18 U | 18 U | 67 U | 67 U | 83 U |
| Phenanthrene | 50,000** | 240 J | 230 J | 1400 | 3300 | 2100 JD | 4200 J | 4300 J | 80 U | 80 U | 1000 J |
| Anthracene | 50,000** | 62 J | 69 J | 100 J | 710 J | 570 JD | 670 J | 920 J | 85 U | 85 U | 450 J |
| Carbazole | | 9.5 U | 9.5 U | 100 J | 16 U | 81 UD | 420 J | 460 J | 79 U | 79 U | 98 U |
| Di-n-butylphthalate | 8,100 | 5.7 U | 5.7 U | 5.5 U | 9.8 U | 49 UD | 13 U | 13 U | 48 U | 48 U | 59 U |
| Fluoranthene | 50,000** | 250 J | 250 J | 2100 | 12000 EJ | 4500 D | 4400 J | 6100 J | 50 U | 50 U | 2100 J |
| Pyrene | 50,000** | 290 J | 320 J | 2400 | 7700 EJ | 5200 D | 6300 | 5600 | 64 U | 360 J | 2400 J |
| Butylbenzylphthalate | 50,000** | 14 U | 14 U | 14 U | 25 U | 120 UD | 33 U | 33 U | 120 U | 120 U | 150 U |
| 3,3-Dichlorobenzidine | | 69 U | 69 U | 66 U | 120 U | 590 UD | 160 U | 160 U | 570 U | 570 U | 710 U |
| Benzo(a)anthracene | 224 or MDL | 130 J | 130 J | 630 | 3800 | 3100 JD | 1400 | 1400 | 54 U | 54 U | 1800 J |
| Chrysene | 400 | 150 J | 160 J | 1100 | 4000 | 3300 JD | 2600 | 2700 | 110 U | 110 U | 2400 J |
| bis(2-Ethylhexyl)phthalate | 50,000** | 9.9 U | 9.9 U | 9.5 U | 17 U | 84 UD | 22 U | 22 U | 82 U | 82 U | 100 U |
| Di-n-octyl phthalate | 50,000** | 10 U | 10 U | 9.9 U | 18 U | 88 UD | 23 U | 23 U | 85 U | 85 U | 110 U |
| Benzo(b)fluoranthene | 1,100 | 85 J | 77 J | 720 | 3700 | 2300 JD | 1800 | 1400 | 190 U | 190 U | 2200 J |
| Benzo(k)fluoranthene | 1,100 | 55 J | 65 J | 290 J | 1400 | 990 JD | 1700 | 1500 | 120 U | 120 U | 1000 J |
| Benzo(a)pyrene | 61 or MDL | 96 J | 98 J | 530 | 2500 | 1900 JD | 1400 | 1400 | 62 U | 62 U | 1700 J |
| Indeno(1,2,3-cd)pyrene | 3,200 | 73 J | 50 J | 460 | 530 J | 1100 JD | 23 U | 130 J | 87 U | 87 U | 1000 J |
| Dibenz(a,h)anthracene | 14 or MDL | 13 U | 13 U | 12 U | 95 J | 110 UD | 28 U | 28 U | 100 U | 100 U | 130 U |
| Benzo(g,h,i)perylene | 50,000** | 48 J | 19 U | 340 J | 500 J | 760 JD | 42 U | 120 J | 160 U | 160 U | 810 J |
| Total Confident Conc. SVOC | | 1585 | 1551 | 10388 | 21575 | 26460 | 27480 | 28600 | 0 | 360 | 16860 |
| Total TICs | | 2670 | 0 | 2770 | 12300 | 0 | 69100 | 0 | 39100 | 0 | 100000 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-19S-1<br>S3970-07<br>08/04/04<br>10.0<br>ug/Kg | TP-19S-1RE<br>S3970-07RE<br>08/04/04<br>10.0<br>ug/Kg | TP-20S-1<br>S3970-08<br>08/04/04<br>1.0<br>ug/Kg | TP-23S-1<br>S3970-09<br>08/04/04<br>1.0<br>ug/Kg | TP-23S-1RE<br>S3970-09RE<br>08/04/04<br>1.0<br>ug/Kg | TP-24S-1<br>S3970-10<br>08/04/04<br>1.0<br>ug/Kg | TP-24S-1RE<br>S3970-10RE<br>08/04/04<br>1.0<br>ug/Kg | TP-28S-1<br>S4063-01<br>08/08/04<br>1.0<br>ug/Kg | TP-30S-1<br>S4063-02<br>08/08/04<br>5.0<br>ug/Kg | TP-34S-1<br>S4063-03<br>08/08/04<br>1.0<br>ug/Kg | TP-35S-1<br>S4063-04<br>08/08/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 1900 U | 1900 U | 43 U | 44 U | 44 U | 23 U | 23 U | 39 U | 960 U | 38 U | 20 U |
| 1,2-Dichlorobenzene | 7,900 | 2100 U | 2100 U | 48 U | 49 U | 49 U | 26 U | 26 U | 43 U | 1100 U | 42 U | 22 U |
| 1,3-Dichlorobenzene | 1,600 | 1500 U | 1500 U | 32 U | 33 U | 33 U | 17 U | 17 U | 29 U | 720 U | 29 U | 15 U |
| 1,4-Dichlorobenzene | 8,500 | 1600 U | 1600 U | 36 U | 38 U | 38 U | 20 U | 20 U | 33 U | 810 U | 32 U | 17 U |
| 2,2-oxybis(1-Chloropropane) | | 2100 U | 2100 U | 47 U | 49 U | 49 U | 26 U | 26 U | 43 U | 1100 U | 42 U | 22 U |
| N-Nitroso-di-n-propylamine | | 1700 U | 1700 U | 39 U | 40 U | 40 U | 21 U | 21 U | 35 U | 860 U | 34 U | 18 U |
| Hexachloroethane | | 1900 U | 1900 U | 42 U | 43 U | 43 U | 23 U | 23 U | 38 U | 930 U | 37 U | 19 U |
| Nitrobenzene | 200 | 2000 U | 2000 U | 44 U | 46 U | 46 U | 24 U | 24 U | 40 U | 990 U | 39 U | 21 U |
| Isophorone | 4,400 | 1500 U | 1500 U | 32 U | 34 U | 34 U | 18 U | 18 U | 29 U | 720 U | 29 U | 15 U |
| bis(2-Chloroethoxy)methane | | 1800 U | 1800 U | 40 U | 41 U | 41 U | 22 U | 22 U | 36 U | 890 U | 35 U | 18 U |
| 1,2,4-Trichlorobenzene | 3,400 | 1100 U | 1100 U | 25 U | 26 U | 26 U | 14 U | 14 U | 23 U | 560 U | 22 U | 12 U |
| Naphthalene | 13,000 | 860 U | 860 U | 19 U | 20 U | 20 U | 10 U | 10 U | 150 J | 420 U | 240 J | 8.8 U |
| 4-Chloroaniline | 220 or MDL | 15000 U | 15000 U | 320 U | 330 U | 330 U | 180 U | 180 U | 290 U | 7200 U | 290 U | 150 U |
| Hexachlorobutadiene | | 1400 U | 1400 U | 31 U | 32 U | 32 U | 17 U | 17 U | 28 U | 680 U | 27 U | 14 U |
| 2-Methylnaphthalene | 36,400 | 680 U | 680 U | 15 U | 16 U | 16 U | 8.2 U | 8.2 U | 14 U | 7500 J | 110 J | 7.0 U |
| Hexachlorocyclopentadiene | | 990 U | 990 U | 22 U | 23 U | 23 U | 12 U | 12 U | 20 U | 490 U | 19 U | 10 U |
| 2-Chloronaphthalene | | 820 U | 820 U | 18 U | 19 U | 19 U | 9.9 U | 9.9 U | 16 U | 410 U | 16 U | 8.4 U |
| 2-Nitroaniline | 430 or MDL | 1400 U | 1400 U | 32 U | 33 U | 33 U | 17 U | 17 U | 29 U | 710 U | 28 U | 15 U |
| Dimethylphthalate | 2,000 | 940 U | 940 U | 21 U | 22 U | 22 U | 11 U | 11 U | 19 U | 460 U | 19 U | 9.7 U |
| Acenaphthylene | 41,000 | 1200 U | 1200 U | 26 U | 27 U | 27 U | 14 U | 14 U | 280 J | 580 U | 210 J | 12 U |
| 2,6-Dinitrotoluene | 1,000 | 1700 U | 1700 U | 37 U | 38 U | 38 U | 20 U | 20 U | 34 U | 830 U | 33 U | 17 U |
| 3-Nitroaniline | 500 or MDL | 6400 U | 6400 U | 140 U | 150 U | 150 U | 77 U | 77 U | 130 U | 3100 U | 130 U | 65 U |
| Acenaphthene | 50,000** | 870 U | 870 U | 19 U | 20 U | 20 U | 10 U | 10 U | 170 J | 430 U | 140 J | 8.9 U |
| Dibenzofuran | 6,200 | 1300 U | 1300 U | 29 U | 30 U | 30 U | 16 U | 16 U | 140 J | 640 U | 26 U | 13 U |
| 2,4-Dinitrotoluene | | 790 U | 790 U | 17 U | 18 U | 18 U | 9.5 U | 9.5 U | 16 U | 390 U | 15 U | 8.1 U |
| Diethylphthalate | 71,000 | 1200 U | 1200 U | 27 U | 28 U | 28 U | 15 U | 15 U | 25 U | 610 U | 24 U | 13 U |
| 4-Chlorophenyl-phenylether | | 980 U | 980 U | 22 U | 22 U | 22 U | 12 U | 12 U | 20 U | 480 U | 19 U | 10 U |
| Fluorene | 50,000** | 1100 U | 1100 U | 25 U | 26 U | 26 U | 13 U | 13 U | 160 J | 550 U | 260 J | 11 U |
| 4-Nitroaniline | | 3100 U | 3100 U | 68 U | 71 U | 71 U | 37 U | 37 U | 62 U | 1500 U | 61 U | 32 U |
| N-Nitrosodiphenylamine | | 1000 U | 1000 U | 22 U | 23 U | 23 U | 12 U | 12 U | 20 U | 490 U | 20 U | 10 U |
| 4-Bromophenyl-phenylether | | 1000 U | 1000 U | 23 U | 24 U | 24 U | 12 U | 12 U | 21 U | 510 U | 20 U | 11 U |
| Hexachlorobenzene | 410 | 740 U | 740 U | 16 U | 17 U | 17 U | 8.9 U | 8.9 U | 15 U | 360 U | 15 U | 7.6 U |
| Phenanthrene | 50,000** | 880 U | 880 U | 450 J | 340 J | 320 J | 11 U | 11 U | 2700 | 5100 J | 740 J | 9.1 U |
| Anthracene | 50,000** | 940 U | 940 U | 95 J | 22 U | 91 J | 11 U | 11 U | 590 J | 460 U | 290 J | 9.7 U |
| Carbazole | | 870 U | 870 U | 19 U | 20 U | 20 U | 10 U | 10 U | 410 J | 430 U | 17 U | 8.9 U |
| Di-n-butylphthalate | 8,100 | 520 U | 520 U | 12 U | 12 U | 12 U | 6.3 U | 6.3 U | 10 U | 260 U | 10 U | 5.4 U |
| Fluoranthene | 50,000** | 550 U | 550 U | 510 J | 510 J | 530 J | 6.6 U | 6.6 U | 4900 | 270 U | 2900 | 5.6 U |
| Pyrene | 50,000** | 700 U | 700 U | 650 J | 630 J | 650 J | 8.5 U | 8.5 U | 4900 | 350 U | 3100 | 61 J |
| Butylbenzylphthalate | 50,000** | 1300 U | 1300 U | 29 U | 30 U | 30 U | 16 U | 16 U | 26 U | 650 U | 26 U | 14 U |
| 3,3-Dichlorobenzidine | | 6300 U | 6300 U | 140 U | 140 U | 140 U | 76 U | 76 U | 130 U | 3100 U | 120 U | 65 U |
| Benzo(a)anthracene | 224 or MDL | 590 U | 590 U | 290 J | 330 J | 320 J | 7.2 U | 7.2 U | 3100 | 2500 J | 1100 | 6.1 U |
| Chrysene | 400 | 1200 U | 1200 U | 360 J | 430 J | 410 J | 15 U | 15 U | 2600 | 3800 J | 1100 | 13 U |
| bis(2-Ethylhexyl)phthalate | 50,000** | 900 U | 900 U | 20 U | 21 U | 21 U | 11 U | 11 U | 140 J | 450 U | 130 J | 76 J |
| Di-n-octyl phthalate | 50,000** | 940 U | 940 U | 21 U | 22 U | 22 U | 11 U | 11 U | 19 U | 460 U | 19 U | 9.7 U |
| Benzo(b)fluoranthene | 1,100 | 2100 U | 2100 U | 260 J | 450 J | 480 J | 25 U | 25 U | 2600 | 1000 U | 1000 | 22 U |
| Benzo(k)fluoranthene | 1,100 | 1300 U | 1300 U | 110 J | 210 J | 210 J | 16 U | 16 U | 1300 | 670 U | 370 J | 14 U |
| Benzo(a)pyrene | 61 or MDL | 680 U | 680 U | 220 J | 330 J | 350 J | 8.2 U | 8.2 U | 2100 | 340 U | 580 J | 7.0 U |
| Indeno(1,2,3-cd)pyrene | 3,200 | 950 U | 950 U | 21 U | 120 J | 22 U | 11 U | 11 U | 1200 | 470 U | 310 J | 9.8 U |
| Dibenz(a,h)anthracene | 14 or MDL | 1200 U | 1200 U | 26 U | 26 U | 26 U | 14 U | 14 U | 180 J | 570 U | 23 U | 12 U |
| Benzo(g,h,i)perylene | 50,000** | 1700 U | 1700 U | 38 U | 110 J | 100 J | 21 U | 21 U | 1100 | 850 U | 280 J | 18 U |
| Total Confident Conc. SVOC | | 0 | 0 | 2945 | 3460 | 3461 | 0 | 0 | 28720 | 18900 | 12860 | 137 |
| Total TICs | | 7900 | 0 | 4900 | 39400 | 0 | 590 | 0 | 7580 | 260000 | 7590 | 9130 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-37S-1<br>S4063-05<br>08/06/04<br>1.0<br>ug/Kg | TP-38S-1<br>S4063-06<br>08/06/04<br>1.0<br>ug/Kg | TP-39S-1<br>S4063-07<br>08/06/04<br>1.0<br>ug/Kg | TP-41S-1<br>S4063-08<br>08/06/04<br>1.0<br>ug/Kg | TP-42S-1<br>S4063-09<br>08/06/04<br>1.0<br>ug/Kg | AT-7S-1<br>S3897-01<br>07/29/04<br>1.0<br>ug/Kg | B-7(14-16)<br>S4313-01<br>08/18/04<br>2.0<br>ug/Kg | B-7(14-16)DL<br>S4313-01RE<br>08/18/04<br>10.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | | 20 U | 42 U | 19 U | 21 U | 40 U | 190 U | 77 U | 390 UD |
| 1,2-Dichlorobenzene | 7,900 | 22 U | 46 U | 21 U | 23 U | 44 U | 210 U | 85 U | 430 UD |
| 1,3-Dichlorobenzene | 1,600 | 15 U | 31 U | 14 U | 16 U | 30 U | 140 U | 58 U | 290 UD |
| 1,4-Dichlorobenzene | 8,500 | 17 U | 35 U | 16 U | 18 U | 34 U | 160 U | 65 U | 330 UD |
| 2,2-oxybis(1-Chloropropane) | | 22 U | 46 U | 21 U | 23 U | 44 U | 210 U | 85 U | 420 UD |
| N-Nitroso-di-n-propylamine | | 18 U | 37 U | 17 U | 19 U | 36 U | 170 U | 69 U | 340 UD |
| Hexachloroethane | | 19 U | 40 U | 18 U | 20 U | 39 U | 180 U | 75 U | 370 UD |
| Nitrobenzene | 200 | 20 U | 43 U | 19 U | 22 U | 41 U | 190 U | 79 U | 400 UD |
| Isophorone | 4,400 | 15 U | 32 U | 14 U | 16 U | 30 U | 140 U | 58 U | 290 UD |
| bis(2-Chloroethoxy)methane | | 18 U | 39 U | 17 U | 19 U | 37 U | 180 U | 71 U | 360 UD |
| 1,2,4-Trichlorobenzene | 3,400 | 12 U | 24 U | 11 U | 12 U | 23 U | 110 U | 45 U | 220 UD |
| Naphthalene | 13,000 | 8.7 U | 110 J | 8.3 U | 9.2 U | 18 U | 84 U | 490 J | 170 UD |
| 4-Chloroaniline | 220 or MDL | 150 U | 310 U | 140 U | 160 U | 300 U | 1400 U | 580 U | 2900 UD |
| Hexachlorobutadiene | | 14 U | 30 U | 13 U | 15 U | 28 U | 130 U | 55 U | 270 UD |
| 2-Methylnaphthalene | 36,400 | 6.9 U | 190 J | 6.6 U | 7.3 U | 14 U | 66 U | 300 J | 130 UD |
| Hexachlorocyclopentadiene | | 10 U | 21 U | 9.6 U | 11 U | 20 U | 96 U | 39 U | 200 UD |
| 2-Chloronaphthalene | | 8.4 U | 18 U | 8.0 U | 8.8 U | 17 U | 80 U | 33 U | 160 UD |
| 2-Nitroaniline | 430 or MDL | 15 U | 31 U | 14 U | 15 U | 29 U | 140 U | 57 U | 280 UD |
| Dimethylphthalate | 2,000 | 9.6 U | 20 U | 9.1 U | 10 U | 19 U | 92 U | 37 U | 190 UD |
| Acenaphthylene | 41,000 | 12 U | 25 U | 11 U | 13 U | 24 U | 110 U | 47 U | 230 UD |
| 2,6-Dinitrotoluene | 1,000 | 17 U | 36 U | 16 U | 18 U | 34 U | 160 U | 67 U | 330 UD |
| 3-Nitroaniline | 500 or MDL | 65 U | 140 U | 62 U | 68 U | 130 U | 620 U | 250 U | 1300 UD |
| Acenaphthene | 50,000** | 8.8 U | 19 U | 8.4 U | 9.3 U | 18 U | 85 U | 1400 J | 1500 JD |
| Dibenzofuran | 6,200 | 13 U | 28 U | 13 U | 14 U | 27 U | 130 U | 51 U | 260 UD |
| 2,4-Dinitrotoluene | | 8.0 U | 17 U | 7.6 U | 8.5 U | 16 U | 77 U | 31 U | 160 UD |
| Diethylphthalate | 71,000 | 13 U | 27 U | 12 U | 13 U | 25 U | 120 U | 49 U | 250 UD |
| 4-Chlorophenyl-phenylether | | 9.9 U | 21 U | 9.5 U | 10 U | 20 U | 95 U | 39 U | 190 UD |
| Fluorene | 50,000** | 11 U | 24 U | 11 U | 12 U | 23 U | 110 U | 1600 | 1800 JD |
| 4-Nitroaniline | | 31 U | 66 U | 30 U | 33 U | 63 U | 300 U | 120 U | 610 UD |
| N-Nitrosodiphenylamine | | 10 U | 22 U | 9.7 U | 11 U | 21 U | 97 U | 40 U | 200 UD |
| 4-Bromophenyl-phenylether | | 11 U | 22 U | 10 U | 11 U | 21 U | 100 U | 41 U | 210 UD |
| Hexachlorobenzene | 410 | 7.5 U | 16 U | 7.2 U | 7.9 U | 15 U | 72 U | 29 U | 150 UD |
| Phenanthrene | 50,000** | 9.0 U | 180 J | 8.6 U | 9.5 U | 410 J | 86 U | 8900 | 10000 D |
| Anthracene | 50,000** | 9.6 U | 20 U | 9.1 U | 10 U | 120 J | 92 U | 3200 | 3300 JD |
| Carbazole | | 8.8 U | 19 U | 8.4 U | 9.3 U | 18 U | 85 U | 550 J | 170 UD |
| Di-n-butylphthalate | 8,100 | 5.3 U | 11 U | 5.1 U | 5.6 U | 11 U | 51 U | 21 U | 100 UD |
| Fluoranthene | 50,000** | 5.6 U | 12 U | 5.3 U | 5.9 U | 500 J | 420 J | 11000 | 18000 D |
| Pyrene | 50,000** | 7.1 U | 15 U | 6.8 U | 7.6 U | 500 J | 670 J | 16000 E | 18000 D |
| Butylbenzylphthalate | 50,000** | 13 U | 28 U | 13 U | 14 U | 27 U | 130 U | 52 U | 260 UD |
| 3,3-Dichlorobenzidine | | 64 U | 140 U | 61 U | 68 U | 130 U | 620 U | 260 J | 1300 UD |
| Benzo(a)anthracene | 224 or MDL | 6.1 U | 13 U | 5.8 U | 6.4 U | 240 J | 58 U | 11000 | 14000 D |
| Chrysene | 400 | 13 U | 120 J | 12 U | 13 U | 270 J | 120 U | 11000 | 13000 D |
| bis(2-Ethylhexyl)phthalate | 50,000** | 44 J | 19 U | 52 J | 74 J | 19 U | 88 U | 280 J | 180 UD |
| Di-n-octyl phthalate | 50,000** | 9.6 U | 20 U | 9.1 U | 10 U | 19 U | 92 U | 37 U | 190 UD |
| Benzo(b)fluoranthene | 1,100 | 21 U | 45 U | 20 U | 23 U | 200 J | 200 U | 19000 E | 18000 D |
| Benzo(k)fluoranthene | 1,100 | 14 U | 29 U | 13 U | 14 U | 100 J | 130 U | 7100 | 7500 JD |
| Benzo(a)pyrene | 61 or MDL | 6.9 U | 15 U | 6.6 U | 7.3 U | 170 J | 66 U | 12000 | 12000 D |
| Indeno(1,2,3-cd)pyrene | 3,200 | 9.7 U | 20 U | 9.3 U | 10 U | 90 J | 93 U | 1800 | 2200 JD |
| Dibenz(a,h)anthracene | 14 or MDL | 12 U | 25 U | 11 U | 12 U | 24 U | 110 U | 420 J | 230 UD |
| Benzo(g,h,i)perylene | 50,000** | 17 U | 37 U | 17 U | 18 U | 35 U | 170 U | 3200 | 3300 JD |
| Total Confident Conc. SVOC | | 44 | 600 | 52 | 74 | 2600 | 1090 | 109500 | 122600 |
| Total TICs | | 6660 | 16200 | 4970 | 4450 | 2050 | 5410 | 53600 | 0 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-1S-1<br>S3970-01<br>08/02/04<br>1.0<br>ug/Kg | TP-5S-1<br>S3970-02<br>08/02/04<br>1.0<br>ug/Kg | TP-6S-1<br>S3970-03<br>08/02/04<br>1.0<br>ug/Kg | TP-8S-1<br>S3970-04<br>08/03/04<br>1.0<br>ug/Kg | TP-8S-1DL<br>S3970-04DL<br>08/03/04<br>100.0<br>ug/Kg | TP-9S-1<br>S3970-05<br>08/03/04<br>1.0<br>ug/Kg | TP-9S-1DL<br>S3970-05DL<br>08/03/04<br>10.0<br>ug/Kg | TP-16S-1<br>S3970-06<br>08/03/04<br>1.0<br>ug/Kg | TP-16S-1DL<br>S3970-06DL<br>08/03/04<br>100.0<br>ug/Kg | TP-19S-1<br>S3970-07<br>08/04/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aroclor-1016** | 10,000 | 6.8 U | 6.5 U | 5.8 U | 7.6 U | 760 UD | 5.6 U | 56 UD | 7.0 U | 700 UD | 6.2 UJ |
| **Aroclor-1221** | 10,000 | 4.6 U | 4.4 U | 3.9 U | 5.2 U | 520 UD | 3.8 U | 38 UD | 4.7 U | 470 UD | 4.2 UJ |
| **Aroclor-1232** | 10,000 | 3.1 U | 3.0 U | 2.7 U | 3.5 U | 350 UD | 2.6 U | 26 UD | 3.2 U | 320 UD | 2.8 UJ |
| **Aroclor-1242** | 10,000 | 4.0 U | 3.9 U | 3.4 U | 4.5 U | 450 UD | 3.3 U | 33 UD | 4.1 U | 410 UD | 3.7 UJ |
| **Aroclor-1248** | 10,000 | 4.8 U | 4.6 U | 4.1 U | 5.4 U | 540 UD | 3.9 U | 39 UD | 4.9 U | 490 UD | 4.3 UJ |
| **Aroclor-1254** | 10,000 | 1.8 U | 1.7 U | 1.5 U | 11000 EPJ | 6000 DPJ | 1000 EJ | 390 DPJ | 5700 EPJ | 2400 DPJ | 1.6 UJ |
| **Aroclor-1260** | 10,000 | 3.8 U | 3.7 U | 60 | 4.3 U | 430 UD | 3.2 U | 32 UD | 3.9 U | 390 UD | 3.5 UJ |
| **Units**<br>**COMPOUND** | | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| **Mercury** | 0.1 | 0.17 J | 0.36 J | 0.23 J | 0.09 J | NA | 0.01 J | NA | 0.06 J | NA | 0.22 J |
| **Arsenic** | 7.5 or SB/(5.89) | 6.810 | 7.500 | 10.7 | 35.5 | NA | 1.090 J | NA | 15.5 | NA | 8.630 |
| **Barium** | 300 or SB/(52.5) | 77.5 | 103 | 81.2 | 778 | NA | 10.1 J | NA | 48.1 | NA | 325 |
| **Cadmium** | 1 or SB/(1.93) | 3.090 | 2.330 | 4.350 | 21.7 | NA | 0.358 J | NA | 3.880 | NA | 3.280 |
| **Chromium** | 10 or SB/(15.8) | 14.4 | 9.830 | 33.7 | 1730 | NA | 4.170 | NA | 33.8 | NA | 54.3 |
| **Lead** | SB/(87.9) | 155 | 229 | 445 | 17200 D | NA | 21.3 | NA | 104 | NA | 303 |
| **Selenium** | 2 or SB/(1.25) | 1.220 J | 0.857 J | 1.310 | 9.180 | NA | 0.341 U | NA | 2.480 | NA | 0.711 J |
| **Silver** | SB/(0.117) | 0.385 J | 0.133 U | 0.640 J | 40.6 | NA | 0.115 U | NA | 1.090 J | NA | 0.126 U |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-20S-1<br>S3970-08<br>08/04/04<br>1.0<br>ug/Kg | TP-23S-1<br>S3970-09<br>08/04/04<br>1.0<br>ug/Kg | TP-24S-1<br>S3970-10<br>08/04/04<br>1.0<br>ug/Kg | TP-28S-1<br>S4063-01<br>08/08/04<br>1.0<br>ug/Kg | TP-30S-1<br>S4063-02<br>08/08/04<br>1.0<br>ug/Kg | TP-34S-1<br>S4063-03<br>08/08/04<br>1.0<br>ug/Kg | TP-35S-1<br>S4063-04<br>08/08/04<br>1.0<br>ug/Kg | TP-37S-1<br>S4063-05<br>08/06/04<br>1.0<br>ug/Kg | TP-38S-1<br>S4063-06<br>08/06/04<br>1.0<br>ug/Kg | TP-39S-1<br>S4063-07<br>08/06/04<br>1.0<br>ug/Kg | TP-41S-1<br>S4063-08<br>08/06/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aroclor-1016** | 10,000 | 6.8 U | 7.1 U | 7.4 U | 6.2 U | 6.1 UJ | 6.0 UJ | 6.4 UJ | 6.3 UJ | 6.7 UJ | 6.0 UJ | 6.5 UJ |
| **Aroclor-1221** | 10,000 | 4.7 U | 4.8 U | 5.1 U | 4.2 U | 4.2 UJ | 4.1 UJ | 4.4 UJ | 4.3 UJ | 4.5 UJ | 4.1 UJ | 4.5 UJ |
| **Aroclor-1232** | 10,000 | 3.2 U | 3.3 U | 3.4 U | 2.9 U | 2.8 UJ | 2.8 UJ | 3.0 UJ | 2.9 UJ | 3.1 UJ | 2.8 UJ | 3.0 UJ |
| **Aroclor-1242** | 10,000 | 4.1 U | 4.2 U | 4.4 U | 3.7 U | 3.6 UJ | 3.6 UJ | 3.8 UJ | 3.7 UJ | 4.0 UJ | 3.6 UJ | 3.9 UJ |
| **Aroclor-1248** | 10,000 | 4.8 U | 5.0 U | 5.2 U | 4.4 U | 4.3 UJ | 4.2 UJ | 4.5 UJ | 4.4 UJ | 4.7 UJ | 4.2 UJ | 4.6 UJ |
| **Aroclor-1254** | 10,000 | 1.8 U | 97 PJ | 1.9 U | 1.6 U | 1.6 UJ | 1.6 UJ | 1.7 UJ | 1.6 UJ | 1.7 UJ | 1.6 UJ | 1.7 UJ |
| **Aroclor-1260** | 10,000 | 3.9 U | 4.0 U | 4.2 U | 180 PJ | 3.5 UJ | 3.4 UJ | 3.6 UJ | 3.5 UJ | 3.8 UJ | 3.4 UJ | 3.7 UJ |
| **Units**<br>**COMPOUND** | | | | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| **Mercury** | 0.1 | 0.45 J | 0.01 U | 0.03 J | 0.01 | 1.4 | 0.17 | 0.03 | 0.06 | 0.05 | 0.03 | 0.04 |
| **Arsenic** | 7.5 or SB/(5.89) | 14.9 | 12.2 | 5.800 | 6.020 | 16.6 | 5.550 | 7.670 | 6.430 | 6.790 | 6.350 | 8.700 |
| **Barium** | 300 or SB/(52.5) | 66.3 | 328 | 70.9 | 177 | 1900 | 147 | 33.8 | 52.7 | 59.2 | 50.5 | 45.7 |
| **Cadmium** | 1 or SB/(1.93) | 13.5 | 3.020 | 2.330 | 0.684 | 7.220 | 1.760 | 1.260 | 0.652 | 1.030 | 0.733 | 1.370 |
| **Chromium** | 10 or SB/(15.8) | 55.5 | 19.8 | 16.8 | 13.6 | 85.0 | 89.5 | 36.2 | 14.0 | 17.1 | 13.0 | 18.3 |
| **Lead** | SB/(87.9) | 199 | 137 | 16.4 | 244 | 2930 | 518 | 31.1 | 17.5 | 55.4 | 43.1 | 23.7 |
| **Selenium** | 2 or SB/(1.25) | 3.450 | 2.040 | 0.916 J | 1.920 | 2.250 | 1.240 | 1.690 | 1.010 J | 0.564 J | 0.831 J | 2.070 |
| **Silver** | SB/(0.117) | 1.130 J | 0.144 U | 0.206 J | 0.124 U | 0.124 U | 0.123 U | 0.130 U | 0.128 U | 0.137 U | 0.122 U | 0.134 U |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Table 3. Ground Water Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Volatile Organics<br>Sample ID<br><br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | TOGS 1.1.1 Standard or Guidance Value[1] | MW-1<br>S4507-01<br>09/01/04<br>1.0<br>ug/L | CHA-1<br>S4507-02<br>09/01/04<br>1.0<br>ug/L | CHA-2<br>S4507-03<br>09/01/04<br>1.0<br>ug/L | CHA-2<br>S5229-01<br>10/15/2004<br>1.0<br>ug/L | CHA-3<br>S4507-04<br>09/01/04<br>1.0<br>ug/L | CHA-4<br>S4507-07<br>09/01/04<br>1.0<br>ug/L | CHA-5<br>S4507-08<br>09/01/04<br>1.0<br>ug/L | CHA-6<br>S4507-09<br>09/01/04<br>1.0<br>ug/L | CHA-10<br>S4507-10<br>09/01/04<br>1.0<br>ug/L | TRIPBLANK<br>S4507-11<br>09/01/04<br>1.0<br>ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chloromethane** | | 0.68 U | 0.68 U | 0.68 U | NA | 0.68 U | 0.68 U | 0.68 U | 0.68 U | 0.68 U | 0.68 U |
| **Vinyl Chloride** | 2 | 0.27 U | 0.27 U | 0.27 U | NA | 0.27 U | 0.27 U | 0.27 U | 0.27 U | 0.27 U | 0.27 U |
| **Bromomethane** | 5 | 0.78 U | 0.78 U | 0.78 U | NA | 0.78 U | 0.78 U | 0.78 U | 0.78 U | 0.78 U | 0.78 U |
| **Chloroethane** | 5 | 0.88 U | 0.88 U | 0.88 U | NA | 0.88 U | 0.88 U | 0.88 U | 0.88 U | 0.88 U | 0.88 U |
| **1,1-Dichloroethene** | 5 | 0.32 U | 0.32 U | 0.32 U | NA | 0.32 U | 0.32 U | 0.32 U | 0.32 U | 0.32 U | 0.32 U |
| **Acetone** | 50[2] | 3.3 U | 3.3 U | 3.3 U | NA | 3.3 U | 3.3 U | 3.3 U | 3.3 U | 3.3 U | 3.3 U |
| **Carbon Disulfide** | | 0.39 U | 0.39 U | 0.39 U | NA | 0.39 U | 0.39 U | 0.39 U | 0.39 U | 0.39 U | 0.39 U |
| **Methylene Chloride** | 5 | 0.62 U | 0.62 U | 0.62 U | NA | 0.62 U | 0.62 U | 0.62 U | 0.62 U | 0.62 U | 0.62 U |
| **trans-1,2-Dichloroethene** | 5 | 0.51 U | 0.51 U | 0.51 U | NA | 0.51 U | 0.51 U | 0.51 U | 0.51 U | 0.51 U | 0.51 U |
| **1,1-Dichloroethane** | 5 | 0.22 U | 0.22 U | 0.22 U | NA | 0.22 U | 0.22 U | 0.22 U | 0.22 U | 0.22 U | 0.22 U |
| **2-Butanone** | | 2.8 U | 2.8 U | 2.8 U | NA | 2.8 U | 2.8 U | 2.8 U | 2.8 U | 2.8 U | 2.8 U |
| **Carbon Tetrachloride** | 5 | 0.47 U | 0.47 U | 0.47 U | NA | 0.47 U | 0.47 U | 0.47 U | 0.47 U | 0.47 U | 0.47 U |
| **cis-1,2-Dichloroethene** | 5 | 0.77 U | 0.77 U | 0.77 U | NA | 0.77 U | 49 | 0.77 U | 0.77 U | 0.77 U | 0.77 U |
| **Chloroform** | 7 | 0.58 U | 0.58 U | 0.58 U | NA | 0.58 U | 0.58 U | 0.58 U | 0.58 U | 0.58 U | 0.58 U |
| **1,1,1-Trichloroethane** | 5 | 0.41 U | 0.41 U | 0.41 U | NA | 0.41 U | 0.41 U | 0.41 U | 0.41 U | 0.41 U | 0.41 U |
| **Benzene** | 0.7 | 0.24 U | 0.24 U | 0.24 U | NA | 0.24 U | 0.24 U | 0.24 U | 0.24 U | 0.24 U | 0.24 U |
| **1,2-Dichloroethane** | 0.6 | 0.32 U | 0.32 U | 0.32 U | NA | 0.32 U | 0.32 U | 0.32 U | 0.32 U | 0.32 U | 0.32 U |
| **Trichloroethene** | 5 | 0.67 U | 5.0 | 0.67 U | NA | 0.67 U | 0.67 U | 0.67 U | 0.67 U | 0.67 U | 0.67 U |
| **1,2-Dichloropropane** | 1 | 0.63 U | 0.63 U | 0.63 U | NA | 0.63 U | 0.63 U | 0.63 U | 0.63 U | 0.63 U | 0.63 U |
| **Bromodichloromethane** | 50[2] | 0.35 U | 0.35 U | 0.35 U | NA | 0.35 U | 0.35 U | 0.35 U | 0.35 U | 0.35 U | 0.35 U |
| **4-Methyl-2-Pentanone** | | 1.3 U | 1.3 U | 1.3 U | NA | 1.3 U | 1.3 U | 1.3 U | 1.3 U | 1.3 U | 1.3 U |
| **Toluene** | 5 | 0.39 U | 0.39 U | 0.39 U | NA | 0.39 U | 0.39 U | 0.39 U | 0.39 U | 0.39 U | 0.39 U |
| **t-1,3-Dichloropropene** | 0.4 | 0.42 U | 0.42 U | 0.42 U | NA | 0.42 U | 0.42 U | 0.42 U | 0.42 U | 0.42 U | 0.42 U |
| **cis-1,3-Dichloropropene** | 0.4 | 0.15 U | 0.15 U | 0.15 U | NA | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U |
| **1,1,2-Trichloroethane** | 1 | 0.52 U | 0.52 U | 0.52 U | NA | 0.52 U | 0.52 U | 0.52 U | 0.52 U | 0.52 U | 0.52 U |
| **2-Hexanone** | 50[2] | 0.66 U | 0.66 U | 0.66 U | NA | 0.66 U | 0.66 U | 0.66 U | 0.66 U | 0.66 U | 0.66 U |
| **Dibromochloromethane** | 50[2] | 0.38 U | 0.38 U | 0.38 U | NA | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U |
| **Tetrachloroethene** | 5 | 0.33 U | 0.33 U | 0.33 U | NA | 0.33 U | 0.33 U | 0.33 U | 0.33 U | 0.33 U | 0.33 U |
| **Chlorobenzene** | 5 | 0.37 U | 0.37 U | 0.37 U | NA | 0.37 U | 0.37 U | 0.37 U | 0.37 U | 0.37 U | 0.37 U |
| **Ethyl Benzene** | 5 | 0.41 U | 0.41 U | 0.41 U | NA | 0.41 U | 0.41 U | 0.41 U | 0.41 U | 0.41 U | 0.41 U |
| **m/p-Xylenes** | 5 | 0.96 U | 0.96 U | 0.96 U | NA | 0.96 U | 0.96 U | 0.96 U | 0.96 U | 0.96 U | 0.96 U |
| **o-Xylene** | 5 | 0.37 U | 0.37 U | 0.37 U | NA | 0.37 U | 0.37 U | 0.37 U | 0.37 U | 0.37 U | 0.37 U |
| **Styrene** | 5 | 0.34 U | 0.34 U | 0.34 U | NA | 0.34 U | 0.34 U | 0.34 U | 0.34 U | 0.34 U | 0.34 U |
| **Bromoform** | 50[2] | 0.25 U | 0.25 U | 0.25 U | NA | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U |
| **1,1,2,2-Tetrachloroethane** | 5 | 0.50 U | 0.50 U | 0.50 U | NA | 0.50 U | 0.50 U | 0.50 U | 0.50 U | 0.50 U | 0.50 U |
| Total Confident Conc. VOC | | 0 | 5 | 0 | | 0 | 49 | 0 | 0 | 0 | 0 |
| Total TICs | | 0 | 0 | 19 | | 0 | 0 | 0 | 0 | 0 | 0 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

1. Shaded values exceed TOGS 1.1.1 Standard or Guidance Value for Class GA Groundwater.

2. Indicates value is a guidance value rather than a standard.

**Table 3. Ground Water Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Semivolatile Organics<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | TOGS 1.1.1 Standard or Guidance Value[1] | MW-1<br>S4507-01<br>09/01/04<br>1.0<br>ug/L | CHA-1<br>S4507-02<br>09/01/04<br>1.0<br>ug/L | CHA-2<br>S4507-03<br>09/01/04<br>1.0<br>ug/L | CHA-2<br>S5229-01<br>10/15/2004<br>1.0<br>ug/L | CHA-3<br>S4507-04<br>09/01/04<br>1.0<br>ug/L | CHA-4<br>S4507-07<br>09/01/04<br>1.0<br>ug/L | CHA-5<br>S4507-08<br>09/01/04<br>1.0<br>ug/L | CHA-6<br>S4507-09<br>09/01/04<br>1.0<br>ug/L | CHA-10<br>S4507-10<br>09/01/04<br>1.0<br>ug/L |
|---|---|---|---|---|---|---|---|---|---|---|
| bis(2-Chloroethyl)ether | 1 | 0.330 U | 0.330 U | 0.330 U | NA | 0.330 U | 0.330 U | 0.330 U | 0.330 U | 0.330 U |
| 1,2-Dichlorobenzene | 3 | 0.590 U | 0.590 U | 0.590 U | NA | 0.590 U | 0.590 U | 0.590 U | 0.590 U | 0.590 U |
| 1,3-Dichlorobenzene | 3 | 1.0 U | 1.0 U | 1.0 U | NA | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,4-Dichlorobenzene | 3 | 0.670 U | 0.680 U | 0.680 U | NA | 0.670 U | 0.670 U | 0.680 U | 0.670 U | 0.670 U |
| 2,2-oxybis(1-Chloropropane) | | 0.830 U | 0.840 U | 0.840 U | NA | 0.830 U | 0.830 U | 0.840 U | 0.830 U | 0.830 U |
| N-Nitroso-di-n-propylamine | | 0.770 U | 0.770 U | 0.770 U | NA | 0.770 U | 0.770 U | 0.770 U | 0.770 U | 0.770 U |
| Hexachloroethane | 5 | 0.910 U | 0.920 U | 0.920 U | NA | 0.910 U | 0.910 U | 0.920 U | 0.910 U | 0.910 U |
| Nitrobenzene | 0.4 | 0.380 U | 0.380 U | 0.380 U | NA | 0.380 U | 0.380 U | 0.380 U | 0.380 U | 0.380 U |
| Isophorone | 50[2] | 0.480 U | 0.480 U | 0.480 U | NA | 0.480 U | 0.480 U | 0.480 U | 0.480 U | 0.480 U |
| bis(2-Chloroethoxy)methane | 5 | 0.440 U | 0.450 U | 0.450 U | NA | 0.440 U | 0.440 U | 0.450 U | 0.440 U | 0.440 U |
| 1,2,4-Trichlorobenzene | 5 | 0.410 U | 0.410 U | 0.410 U | NA | 0.410 U | 0.410 U | 0.410 U | 0.410 U | 0.410 U |
| Naphthalene | 10 | 0.270 U | 0.270 U | 1.5 J | NA | 0.270 U | 0.270 U | 0.270 U | 0.270 U | 0.270 U |
| 4-Chloroaniline | 5 | 4.1 U | 4.1 U | 4.1 U | NA | 4.1 U | 4.1 U | 4.1 U | 4.1 U | 4.1 U |
| Hexachlorobutadiene | 0.5 | 0.380 U | 0.380 U | 0.380 U | NA | 0.380 U | 0.380 U | 0.380 U | 0.380 U | 0.380 U |
| 2-Methylnaphthalene | 50[2] | 0.500 U | 0.500 U | 0.500 U | NA | 0.500 U | 0.500 U | 0.500 U | 0.500 U | 0.500 U |
| Hexachlorocyclopentadiene | 5 | 0.450 U | 0.460 U | 0.460 U | NA | 0.450 U | 0.450 U | 0.460 U | 0.450 U | 0.450 U |
| 2-Chloronaphthalene | 10[2] | 0.390 U | 0.390 U | 0.390 U | NA | 0.390 U | 0.390 U | 0.390 U | 0.390 U | 0.390 U |
| 2-Nitroaniline | 5 | 0.300 U | 0.300 U | 0.300 U | NA | 0.300 U | 0.300 U | 0.300 U | 0.300 U | 0.300 U |
| Dimethylphthalate | 50[2] | 0.260 U | 0.260 U | 0.260 U | NA | 0.260 U | 0.260 U | 0.260 U | 0.260 U | 0.260 U |
| Acenaphthylene | 20 | 0.430 U | 0.440 U | 0.440 U | NA | 0.430 U | 0.430 U | 0.440 U | 0.430 U | 0.430 U |
| 2,6-Dinitrotoluene | 5 | 0.410 U | 0.420 U | 0.420 U | NA | 0.410 U | 0.410 U | 0.420 U | 0.410 U | 0.410 U |
| 3-Nitroaniline | 5 | 1.0 U | 1.1 U | 1.1 U | NA | 1.0 U | 1.0 U | 1.1 U | 1.0 U | 1.0 U |
| Acenaphthene | 20[2] | 0.240 U | 0.240 U | 0.240 U | NA | 0.240 U | 0.240 U | 0.240 U | 2.6 J | 0.240 U |
| Dibenzofuran | | 0.310 U | 0.320 U | 0.320 U | NA | 0.310 U | 0.310 U | 0.320 U | 0.310 U | 0.310 U |
| 2,4-Dinitrotoluene | 5 | 0.340 U | 0.340 U | 0.340 U | NA | 0.340 U | 0.340 U | 0.340 U | 0.340 U | 0.340 U |
| Diethylphthalate | 50[2] | 0.340 U | 0.340 U | 0.340 U | NA | 0.340 U | 0.340 U | 0.340 U | 0.340 U | 0.340 U |
| 4-Chlorophenyl-phenylether | | 0.360 U | 0.370 U | 0.370 U | NA | 0.360 U | 0.360 U | 0.370 U | 0.360 U | 0.360 U |
| Fluorene | 50[2] | 0.170 U | 0.170 U | 0.170 U | NA | 0.170 U | 0.170 U | 0.170 U | 2.2 J | 0.170 U |
| 4-Nitroaniline | 5 | 0.830 U | 0.840 U | 0.840 U | NA | 0.830 U | 0.830 U | 0.840 U | 0.830 U | 0.830 U |
| N-Nitrosodiphenylamine | 50[2] | 0.280 U | 0.280 U | 0.280 U | NA | 0.280 U | 0.280 U | 0.280 U | 0.280 U | 0.280 U |
| 4-Bromophenyl-phenylether | | 0.170 U | 0.170 U | 0.170 U | NA | 0.170 U | 0.170 U | 0.170 U | 0.170 U | 0.170 U |
| Hexachlorobenzene | 0.04 | 0.230 U | 0.230 U | 0.230 U | NA | 0.230 U | 0.230 U | 0.230 U | 0.230 U | 0.230 U |
| Phenanthrene | 50[2] | 0.270 U | 0.280 U | 0.280 U | NA | 0.270 U | 0.270 U | 0.280 U | 1.1 J | 0.270 U |
| Anthracene | 50[2] | 0.160 U | 0.160 U | 0.160 U | NA | 0.160 U | 0.160 U | 0.160 U | 0.160 U | 0.160 U |
| Carbazole | | 0.310 U | 0.310 U | 0.310 U | NA | 0.310 U | 0.310 U | 0.310 U | 0.310 U | 0.310 U |
| Di-n-butylphthalate | 50[2] | 0.098 U | 0.099 U | 0.099 U | NA | 3.9 J | 0.098 U | 0.099 U | 0.098 U | 0.098 U |
| Fluoranthene | 50[2] | 0.210 U | 0.210 U | 0.210 U | NA | 0.210 U | 0.210 U | 0.210 U | 0.210 U | 0.210 U |
| Pyrene | 50[2] | 0.250 U | 0.250 U | 0.250 U | NA | 0.250 U | 0.250 U | 0.250 U | 0.250 U | 0.250 U |
| Butylbenzylphthalate | 50[2] | 0.300 U | 0.300 U | 0.300 U | NA | 0.300 U | 0.300 U | 0.300 U | 0.300 U | 0.300 U |
| 3,3-Dichlorobenzidine | 5 | 1.6 U | 1.6 U | 1.6 U | NA | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 1.6 U |
| Benzo(a)anthracene | 0.002[2] | 0.220 U | 0.230 U | 0.230 U | NA | 0.220 U | 0.220 U | 0.230 U | 0.220 U | 0.220 U |
| Chrysene | 0.002[2] | 0.380 U | 0.390 U | 0.390 U | NA | 0.380 U | 0.380 U | 0.390 U | 0.380 U | 0.380 U |
| bis(2-Ethylhexyl)phthalate | 5 | 0.340 U | 0.350 U | 1.7 J | NA | 0.340 U | 0.340 U | 1.2 J | 1.8 J | 0.340 U |
| Di-n-octyl phthalate | 50[2] | 0.170 U | 0.170 U | 0.170 U | NA | 0.170 U | 0.170 U | 0.170 U | 0.170 U | 0.170 U |
| Benzo(b)fluoranthene | 0.002[2] | 0.230 U | 0.230 U | 0.230 U | NA | 0.230 U | 0.230 U | 0.230 U | 0.230 U | 0.230 U |
| Benzo(k)fluoranthene | 0.002[2] | 0.380 U | 0.390 U | 0.390 U | NA | 0.380 U | 0.380 U | 0.390 U | 0.380 U | 0.380 U |
| Benzo(a)pyrene | ND | 0.450 U | 0.450 U | 0.450 U | NA | 0.450 U | 0.450 U | 0.450 U | 0.450 U | 0.450 U |
| Indeno(1,2,3-cd)pyrene | 0.002[2] | 0.290 U | 0.290 U | 0.290 U | NA | 0.290 U | 0.290 U | 0.290 U | 0.290 U | 0.290 U |
| Dibenz(a,h)anthracene | 50 | 0.290 U | 0.290 U | 0.290 U | NA | 0.290 U | 0.290 U | 0.290 U | 0.290 U | 0.290 U |
| Benzo(g,h,i)perylene | | 0.420 U | 0.430 U | 0.430 U | NA | 0.420 U | 0.420 U | 0.430 U | 0.420 U | 0.420 U |
| Total Confident Conc. SVOC | | 0 | 0 | 3.2 | | 3.9 | 0 | 1.2 | 7.7 | 0 |
| Total TICs | | 6.6 | 6.2 | 131 | | 8 | 6.6 | 24.1 | 311 | 7.4 |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

1. Shaded values exceed TOGS 1.1.1 Standard or Guidance Value for Class GA Groundwater.

2. Indicates value is a guidance value rather than a standard.

**Table 3. Ground Water Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**
**Poughkeepsie, New York**

| Sample ID | | MW-1 | CHA-1 | CHA-2 | CHA-2 | CHA-3 | CHA-4 | CHA-5 | CHA-6 | CHA-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | S4507-01 | S4507-02 | S4507-03 | S5229-01 | S4507-04 | S4507-07 | S4507-08 | S4507-09 | S4507-10 |
| Sampling Date | TOGS 1.1.1 | 9/1/04 | 9/1/04 | 9/1/04 | 10/15/2004 | 9/1/04 | 9/1/04 | 9/1/04 | 9/1/04 | 9/1/04 |
| Dilution Factor | Standard or | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Units | Guidance | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| COMPOUND | Value[1] | | | | | | | | | |
| Aroclor-1016 | 0.09 | 0.130 U | 0.130 U | 0.130 U | 0.130 U | 0.130 U | 0.130 U | 0.130 U | 0.130 U | 0.130 U |
| Aroclor-1221 | 0.09 | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U |
| Aroclor-1232 | 0.09 | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U | 0.050 U |
| Aroclor-1242 | 0.09 | 0.140 U | 0.140 U | 0.140 U | 0.140 U | 0.140 U | 0.140 U | 0.140 U | 0.140 U | 0.140 U |
| Aroclor-1248 | 0.09 | 0.060 U | 0.060 U | 0.060 U | 0.060 U | 0.060 U | 0.060 U | 0.060 U | 0.060 U | 0.060 U |
| Aroclor-1254 | 0.09 | 0.030 U | 0.030 U | 0.030 U | 0.030 U | 0.030 U | 0.030 U | 0.030 U | 0.030 U | 0.030 U |
| Aroclor-1260 | 0.09 | 0.0630 U | 0.0620 U | 4.7 P | 0.31 J | 0.0640 U | 0.0620 U | 0.0640 U | 0.0620 U | 0.0630 U |
| Units | | ug/L | ug/L | ug/L | | ug/L | ug/L | ug/L | ug/L | ug/L |
| COMPOUND | | | | | | | | | | |
| Arsenic | 25 | 4.8 U | 4.8 U | 4.8 U | NA | 4.8 U | 4.8 U | 4.8 U | 4.8 U | 4.8 U |
| Barium | 1,000 | 67.3 J | 78.8 J | 204 | NA | 16.1 J | 117 J | 46.8 J | 81.4 J | 80.1 J |
| Cadmium | 5 | 0.99 U | 0.99 U | 0.99 U | NA | 0.99 U | 0.99 U | 0.99 U | 0.99 U | 0.99 U |
| Chromium | 50 | 1.2 U | 2.7 J | 1.2 U | NA | 3.1 J | 2.4 J | 1.8 J | 1.2 U | 1.2 U |
| Lead | 25 | 1.8 U | 22.2 | 1.8 U | NA | 21.0 | 1.8 U | 39.2 | 1.8 U | 1.8 U |
| Selenium | 10 | 5.2 U | 5.2 U | 5.2 U | NA | 5.2 U | 5.2 U | 5.2 U | 5.2 U | 5.2 U |
| Silver | 50 | 3.4 U | 3.4 U | 3.4 U | NA | 3.4 U | 3.4 U | 3.4 U | 3.4 U | 3.4 U |
| Mercury | 0.7 | 0.06 J | 0.03 J | 0.03 U | NA | 0.04 J | 0.03 U | 0.08 J | 0.04 J | 0.03 U |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

1. Shaded values exceed TOGS 1.1.1 Standard or Guidance Value for Class GA Groundwater.

2. Indicates value is a guidance value rather than a standard.

**Table 2. Subsurface Soil Sample Laboratory Results Summary**
**DeLaval Property**
**Pine Street and Rinaldi Boulevard**

| PCBs and Metals<br>Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>Dilution Factor<br>Units<br>COMPOUND | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | TP-42S-1<br>S4063-09<br>08/06/04<br>1.0<br>ug/Kg | AT-7S-1<br>S3897-01<br>07/29/04<br>1.0<br>ug/Kg | B-7(14-16)<br>S4313-01<br>8/18/04<br>1.0<br>ug/Kg |
|---|---|---|---|---|
| Aroclor-1016 | 10,000 | 6.4 UJ | 6.0 U | 6.2 U |
| Aroclor-1221 | 10,000 | 4.4 UJ | 4.1 U | 4.2 U |
| Aroclor-1232 | 10,000 | 3.0 UJ | 2.8 U | 2.8 U |
| Aroclor-1242 | 10,000 | 3.8 UJ | 3.6 U | 3.7 U |
| Aroclor-1248 | 10,000 | 4.5 UJ | 4.2 U | 4.3 U |
| Aroclor-1254 | 10,000 | 1.7 UJ | 1.6 U | 1.6 U |
| Aroclor-1260 | 10,000 | 3.6 UJ | 3.4 U | 340 |
| Units<br>COMPOUND | | mg/Kg | mg/Kg | mg/Kg |
| Mercury | 0.1 | 0.01 U | 0.01 UJ | 0.01 U |
| Arsenic | 7.5 or SB/(5.89) | 8.140 | 18.8 | 0.306 J |
| Barium | 300 or SB/(52.5) | 126 | 75.7 | 11.4 J |
| Cadmium | 1 or SB/(1.93) | 0.712 | 2.280 | 0.307 J |
| Chromium | 10 or SB/(15.8) | 8.880 | 29.2 | 5.840 J |
| Lead | SB/(87.9) | 71.1 | 119 | 26.8 |
| Selenium | 2 or SB/(1.25) | 1.020 J | 2.690 | 1.200 J |
| Silver | SB/(0.117) | 0.127 U | 0.777 J | 0.125 U |

**Qualifiers & Notes:**

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit, but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Value exceeds calibration range.

D - Compound identified in analysis at a secondary dilution factor.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NA-not analyzed

MDL - Method Detection Limit

** - As per TAGM #4046, Total VOCs<10ppm., Total Semi-VOCs<500ppm., and Individual Semi-VOCs<50ppm.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Confirmatory Soil Sample Laboratory Results AOC 1 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID | | | AOC 1 (Zone 5) | AOC 1 (Zone 1) | AOC 1 (Zone 6) | AOC 1 (Zone 5) | AOC 1 (Zone 3) | AOC 1 (Sample 6) | AOC 1 (Sample 7) | AOC 1 (Sample 8) | AOC 1 (Sample 9) | AOC 1 (Sample 10) | AOC 1 (Sample 11) | AOC 1 (Sample 12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Sample No. | | | 09061029-01 | 09060750-01 | 09060750-02 | 09060750-03 | 09060750-04 | 09070468-02 | 09070468-03 | 09070468-04 | 09070468-05 | 09070468-06 | 09070468-07 | 09070468-08 |
| Sample No. on Figure | | | 5 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Sampling Date | | | 6/29/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 |
| COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | | | | | | | | | | | | |
| ***Volatile Organic Compounds (VOCs)*** | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | µg/Kg | 800 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | µg/Kg | 600 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichlorotrifluoroethane | µg/Kg | 6,000 | | | | | | | | | | | | |
| 1,1-Dichloroethane | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethylene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethene | µg/Kg | 200 | | | | | | | | | | | | |
| 1,1-Dichloropropylene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichlorobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichloropropane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | µg/Kg | 3,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromo-3-Chloropropane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethylene (cis) | µg/Kg | | | | | | | | | | | | | |
| 1,2-Dichloroethylene (trans) | µg/Kg | | | | | | | | | | | | | |
| 1,2-Dichloroethylene (total) | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,2-Dichloropropane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Chlorotoluene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Chlorotoluene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Butanone | µg/Kg | 300 | | | | | | | | | | | | |
| 2-Hexanone | µg/Kg | | | | | | | | | | | | | |
| 4-Methyl-2-Pentanone | µg/Kg | 1,000 | | | | | | | | | | | | |
| Acetone | µg/Kg | 200 | | | | | | | | | | | | |
| Benzene | µg/Kg | 60 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromochloromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromodichloromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | µg/Kg | 2,700 | | | | | | | | | | | | |
| Carbon Tetrachloride | µg/Kg | 600 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | µg/Kg | 1,700 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroethane | µg/Kg | 1,900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | µg/Kg | 300 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,3-Dichloropropene | µg/Kg | | | | | | | | | | | | | |
| cis-1,3-Dichloropropylene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromochloromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromofluoromethane | µg/Kg | | | | | | | | | | | | | |
| Dibromomethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichlorodifluoromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Ethylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isopropylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl tert-butyl Ether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Napthalene | µg/Kg | 13,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 92 | ND |
| n-Butylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Propylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| o-Xylene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-& m-Xylenes | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-Isopropyltoluene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sec-Butylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 72 | ND |
| Styrene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| tert-Butylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloroethene | µg/Kg | 1,400 | | | | | | | | | | | | |
| Tetrachloroethylene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

**Confirmatory Soil Sample Laboratory Results AOC 1 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID | | | AOC 1 (Zone 5) | AOC 1 (Zone 1) | AOC 1 (Zone 6) | AOC 1 (Zone 5) | AOC 1 (Zone 3) | AOC 1 (Sample 6) | AOC 1 (Sample 7) | AOC 1 (Sample 8) | AOC 1 (Sample 9) | AOC 1 (Sample 10) | AOC 1 (Sample 11) | AOC 1 (Sample 12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Sample No. | | | 09061029-01 | 09060750-01 | 09060750-02 | 09060750-03 | 09060750-04 | 09070468-02 | 09070468-03 | 09070468-04 | 09070468-05 | 09070468-06 | 09070468-07 | 09070468-08 |
| Sample No. on Figure | | | 5 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Sampling Date | | | 6/29/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 |
| COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | | | | | | | | | | | | |
| Toluene | µg/Kg | 1,500 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | µg/Kg | | | | | | | | | | | | | |
| trans-1,3-Dichloropropylene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloroethene | µg/Kg | 700 | | | | | | | | | | | | |
| Trichloroethylene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichlorofluoromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Xylenes | µg/Kg | 1,200 | | | | | | | | | | | | |
| ***Semivolatile Organic Compounds (SVOCs)*** | | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | µg/Kg | 3,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | µg/Kg | 7,900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | µg/Kg | 1,600 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | µg/Kg | 8,500 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4,5-Trichlorophenol | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dichlorophenol | µg/Kg | 400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrotoluene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,6-Dinitrotoluene | µg/Kg | 1,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Chloronaphthalene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Chlorophenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | µg/Kg | 36,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylphenol | µg/Kg | 100 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Nitroaniline | µg/Kg | 430 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Nitrophenol | µg/Kg | 330 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,3-Dichlorobenzidine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3-Methylphenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3-Nitroaniline | µg/Kg | 500 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4,6-Dinitro-2-methylphenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Bromophenyl-phenylether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Chloro-3-methylphenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Chloroaniline | µg/Kg | 220 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Chlorophenyl-phenylether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Methylphenol | µg/Kg | 900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Nitroaniline | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Nitrophenol | µg/Kg | 100 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | µg/Kg | 41,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aniline | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Anthracene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzidine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo(a)anthracene | µg/Kg | 224 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | **300** | **470** | **230** |
| Benzo(a)pyrene | µg/Kg | 61 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **370** | ND |
| Benzo(b)fluoranthene | µg/Kg | 1,100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 360 | ND |
| Benzo(g,h,i)perylene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo(k)fluoranthene | µg/Kg | 1,100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 330 | ND |
| Benzoic acid | µg/Kg | | | | | | | | | | | | | |
| Benzyl alcohol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Chloroethoxy)methane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Chloroethyl)ether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Chloroisopropyl)ether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Ethylhexyl)phthalate | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Butylbenzylphthalate | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | µg/Kg | 400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 340 | ND |
| Dibenz(a,h)anthracene | µg/Kg | 14 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | µg/Kg | 6,200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diethylphthalate | µg/Kg | 71,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethylphthalate | µg/Kg | 2,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Di-n-butylphthalate | µg/Kg | 8,100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Fluoranthene | µg/Kg | 50,000** | ND | 370 | ND | ND | ND | ND | ND | ND | 390 | 450 | 930 | 320 |
| Fluorene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorobenzene | µg/Kg | 410 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorocyclopentadiene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachloroethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

**Confirmatory Soil Sample Laboratory Results AOC 1 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID | | | AOC 1 (Zone 5) | AOC 1 (Zone 1) | AOC 1 (Zone 6) | AOC 1 (Zone 5) | AOC 1 (Zone 3) | AOC 1 (Sample 6) | AOC 1 (Sample 7) | AOC 1 (Sample 8) | AOC 1 (Sample 9) | AOC 1 (Sample 10) | AOC 1 (Sample 11) | AOC 1 (Sample 12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Sample No. | | | 09061029-01 | 09060750-01 | 09060750-02 | 09060750-03 | 09060750-04 | 09070468-02 | 09070468-03 | 09070468-04 | 09070468-05 | 09070468-06 | 09070468-07 | 09070468-08 |
| Sample No. on Figure | | | 5 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Sampling Date | | | 6/29/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 |
| COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | | | | | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | µg/Kg | 3,200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isophorone | µg/Kg | 4,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Naphthalene | µg/Kg | 13,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Nitrobenzene | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| N-Nitroso-di-n-propylamine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| N-Nitrosodiphenylamine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Pentachlorophenol | µg/Kg | 1000 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Phenanthrene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 220 |
| Phenol | µg/Kg | 30 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Pyrene | µg/Kg | 50,000** | ND | 390 | ND | ND | ND | ND | ND | ND | 360 | 470 | 780 | 290 |
| Pyridine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| ***PCBs*** | | | | | | | | | | | | | | |
| Aroclor-1016 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1221 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1232 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1242 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1248 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1254 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | 0.289 | 0.054 | ND | ND |
| Aroclor-1260 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | 0.538 | 0.089 | ND | ND |
| ***Herbicides*** | | | | | | | | | | | | | | |
| 2,3,5-TP Silvex | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-D | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| ***Pesticides*** | | | | | | | | | | | | | | |
| 4,4'-DDD | µg/Kg | 2900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4,4'-DDE | µg/Kg | 2100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | µg/Kg | 2100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aldrin | µg/Kg | 41 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| alpha Chlordane | µg/Kg | 540 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| alpha BHC | µg/Kg | 110 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| beta BHC | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| delta BHC | µg/Kg | 300 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dieldrin | µg/Kg | 44 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan I | µg/Kg | 900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan II | µg/Kg | 900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan sulfate | µg/Kg | 1000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Endrin | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Endrin aldehyde | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| gamma Chlordane | µg/Kg | 540 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| gamma-BHC (Lindane) | µg/Kg | 60 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor epoxide | µg/Kg | 20 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methoxychlor | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Toxaphene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| ***Metals*** | | | | | | | | | | | | | | |
| Mercury | mg/Kg | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aluminum | mg/Kg | SB | | | | | | | | | | | | |
| Antimony | mg/Kg | SB | 0.92 | ND | ND | 1.08 | 0.94 | 1.1 | 1.12 | 0.81 | 3.38 | 1.46 | 1.38 | 1.12 |
| Arsenic | mg/Kg | 7.5 or SB/(5.89) | 5.04 | **6.09** | 4.04 | **11.7** | **11.9** | **7** | **6.19** | 6.46 | **7.53** | 3.05 | 4.26 | 3.3 |
| Barium | mg/Kg | 300 or SB/(52.5) | 42.9 | **71.8** | | **78.6** | **75.9** | 26.8 | 38.2 | 25.3 | **84.5** | 33.6 | 29 | 29.4 |
| Beryllium | mg/Kg | 0.16 (HEAST) or SB | **0.36** | ND | ND | 0.12 | 0.1 | **0.4** | **0.26** | 0.36 | ND | ND | 0.13 | ND |
| Cadmium | mg/Kg | 1 or SB/(1.93) | ND | 0.43 | ND | 0.65 | 0.62 | ND | ND | ND | 0.72 | 0.37 | ND | 0.3 |
| Calcium | mg/Kg | SB | | | | | | | | | | | | |
| Chromium | mg/Kg | 10 or SB/(15.8) | **16.7** | 15.4 | 12.2 | **26** | **25.8** | 14.4 | 11.7 | 13.2 | **121** | **47.5** | **13.1** | **27.1** |
| Cobalt | mg/Kg | 30 or SB | | | | | | | | | | | | |
| Copper | mg/Kg | 25 or SB | **47.5** | 88.4 | 12.1 | 570 | 623 | **123** | 212 | 99.4 | **890** | **2050** | **70.7** | **1740** |
| Iron | mg/Kg | 2000 or SB | | | | | | | | | | | | |
| Lead | mg/Kg | SB | 45.6 | 95.6 | 8.22 | 167 | 187 | 37.3 | 70.4 | 37.4 | 201 | 192 | 19.9 | 135 |
| Magnesium | mg/Kg | SB | | | | | | | | | | | | |
| Manganese | mg/Kg | SB | | | | | | | | | | | | |
| Nickel | mg/Kg | 13 or SB | **32** | **16.6** | **15.7** | **22.6** | **22** | **36.9** | **46.3** | **28.1** | **180** | **347** | **51.1** | **323** |
| Potassium | mg/Kg | SB | | | | | | | | | | | | |
| Selenium | mg/Kg | 2 or SB/(1.25) | ND | ND | ND | ND | ND | 1.04 | **1.49** | 1.07 | **1.33** | 1.02 | ND | 1.05 |
| Silver | mg/Kg | SB | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.5 | ND | 0.33 |
| Sodium | mg/Kg | SB | | | | | | | | | | | | |
| Thallium | mg/Kg | SB | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vanadium | mg/Kg | 150 or SB | | | | | | | | | | | | |
| Zinc | mg/Kg | 20 or SB/(0.117) | **108** | **325** | **50** | **264** | **281** | **98** | **220** | **86.3** | **362** | **476** | **75** | **352** |

**Confirmatory Soil Sample Laboratory Results AOC 1 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID | | | AOC 1 (Zone 5) | AOC 1 (Zone 1) | AOC 1 (Zone 6) | AOC 1 (Zone 5) | AOC 1 (Zone 3) | AOC 1 (Sample 6) | AOC 1 (Sample 7) | AOC 1 (Sample 8) | AOC 1 (Sample 9) | AOC 1 (Sample 10) | AOC 1 (Sample 11) | AOC 1 (Sample 12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Sample No. | | | 09061029-01 | 09060750-01 | 09060750-02 | 09060750-03 | 09060750-04 | 09070468-02 | 09070468-03 | 09070468-04 | 09070468-05 | 09070468-06 | 09070468-07 | 09070468-08 |
| Sample No. on Figure | | | 5 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Sampling Date | | | 6/29/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 |
| COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | | | | | | | | | | | | |
| ***Hazardous Waste Characterisitics*** | | | | | | | | | | | | | | |
| Conductivity | umhos/cm | | 55 | 2.42 | 1.72 | 5.59 | 6.49 | 17.7 | 10.2 | 17.3 | 44.2 | 48.5 | 14.9 | 41.2 |
| Flash Point | °F | | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 |
| Reactivity - Cyanide | mg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Reactivity - Sulfide | mg/Kg | | 16 | 39 | 20 | 34 | 43 | 25 | 20 | ND | 31 | ND | ND | ND |
| Ignitability | | | | | | | | | | | | | | |
| Total Petroleum Hyrocarbons-DRO | mg/Kg | | ND | 39 | ND | 140 | 131 | ND | ND | 43.9 | 410 | 114 | 182 | 59.5 |
| Total Petroleum Hyrocarbons-GRO | mg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | 35 | 4 | 35 | 4 |
| pH | S.U. | | 8.59 | 7.2 | 7.51 | 6.74 | 6.58 | 6.85 | 6.88 | 7.05 | 7.35 | 8.09 | 6.65 | 7.47 |

**Qualifiers & Notes:**

ND - The compound was not detected at the indicated concentration.

SB - Site Background

Blank cells indicate that that compound was not analyzed.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Confirmatory Soil Sample Laboratory Results AOC 2/3 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | AOC 2/3 1<br>09020549-01<br>2/13/2009 | AOC 2/3 2<br>09020549-02<br>2/13/2009 | AOC 2/3 3<br>09020549-03<br>2/13/2009 | #23 Bottom<br>09040050-01<br>3/12/2009 | #18 Side<br>09040050-02<br>3/18/2009 | #18 Bottom<br>09040050-03<br>3/13/2009 | #13 Bottom<br>09040050-04<br>3/13/2009 | #10 Side<br>09040050-05<br>3/18/2009 | #7 Bottom<br>09040050-06<br>3/18/2009 | AOC 2/3 Grid 19<br>09040888-01<br>4/23/2009 | AOC 2/3 Grid 11<br>09040888-02<br>4/23/2009 | AOC 2/3 Grid 4<br>09040888-03<br>4/23/2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Volatile Organic Compounds (VOCs)*** | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,1,1-Trichloroethane | µg/Kg | 800 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | µg/Kg | 600 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichlorotrifluoroethane | µg/Kg | 6,000 | ND | ND | ND | | | | | | | ND | ND | ND |
| 1,1-Dichloroethane | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethylene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,1-Dichloroethene | µg/Kg | 200 | ND | ND | ND | | | | | | | ND | ND | ND |
| 1,1-Dichloropropylene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,2,3-Trichlorobenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,2,3-Trichloropropane | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,2,4-Trichlorobenzene | µg/Kg | 3,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,2-Dibromo-3-Chloropropane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethylene (cis) | µg/Kg | | ND | ND | ND | | | | | | | ND | ND | ND |
| 1,2-Dichloroethylene (trans) | µg/Kg | | ND | ND | ND | | | | | | | ND | ND | ND |
| 1,2-Dichloroethylene (total) | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,2-Dichloropropane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,3-Dichlorobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 1,4-Dichlorobenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,2-Dichloropropane | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 2-Chlorotoluene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 4-Chlorotoluene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 2-Butanone | µg/Kg | 300 | ND | ND | ND | | | | | | | ND | ND | ND |
| 2-Hexanone | µg/Kg | | ND | ND | ND | | | | | | | ND | ND | ND |
| 4-Methyl-2-Pentanone | µg/Kg | 1,000 | ND | ND | ND | | | | | | | ND | ND | ND |
| Acetone | µg/Kg | 200 | ND | ND | ND | | | | | | | ND | ND | ND |
| Benzene | µg/Kg | 60 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Bromochloromethane | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Bromodichloromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | µg/Kg | 2,700 | ND | ND | ND | | | | | | | ND | ND | ND |
| Carbon Tetrachloride | µg/Kg | 600 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | µg/Kg | 1,700 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroethane | µg/Kg | 1,900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | µg/Kg | 300 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,3-Dichloropropene | µg/Kg | | ND | ND | ND | | | | | | | ND | ND | ND |
| cis-1,3-Dichloropropylene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Dibromochloromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromofluoromethane | µg/Kg | | ND | ND | ND | | | | | | | ND | ND | ND |
| Dibromomethane | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Dichlorodifluoromethane | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Ethylbenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Isopropylbenzene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl tert-butyl Ether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Napthalene | µg/Kg | 13,000 | | | | ND | ND | ND | 630 | ND | ND | | | |
| n-Butylbenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| n-Propylbenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| o-Xylene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| p-& m-Xylenes | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| p-Isopropyltoluene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| sec-Butylbenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Styrene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| tert-Butylbenzene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Tetrachloroethene | µg/Kg | 1,400 | ND | ND | ND | | | | | | | 36 | ND | ND |
| Tetrachloroethylene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |

**Confirmatory Soil Sample Laboratory Results AOC 2/3 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | AOC 2/3 1<br>09020549-01<br>2/13/2009 | AOC 2/3 2<br>09020549-02<br>2/13/2009 | AOC 2/3 3<br>09020549-03<br>2/13/2009 | #23 Bottom<br>09040050-01<br>3/12/2009 | #18 Side<br>09040050-02<br>3/18/2009 | #18 Bottom<br>09040050-03<br>3/13/2009 | #13 Bottom<br>09040050-04<br>3/13/2009 | #10 Side<br>09040050-05<br>3/18/2009 | #7 Bottom<br>09040050-06<br>3/18/2009 | AOC 2/3 Grid 19<br>09040888-01<br>4/23/2009 | AOC 2/3 Grid 11<br>09040888-02<br>4/23/2009 | AOC 2/3 Grid 4<br>09040888-03<br>4/23/2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Toluene | µg/Kg | 1,500 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | µg/Kg | | ND | ND | ND | | | | | | | ND | ND | ND |
| trans-1,3-Dichloropropylene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Trichloroethene | µg/Kg | 700 | ND | ND | ND | | | | | | | ND | ND | ND |
| Trichloroethylene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Trichlorofluoromethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Xylenes | µg/Kg | 1,200 | ND | ND | ND | | | | | | | ND | ND | ND |
| ***Semivolatile Organic Compounds (SVOCs)*** | | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | µg/Kg | 3,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | µg/Kg | 7,900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | µg/Kg | 1,600 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | µg/Kg | 8,500 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4,5-Trichlorophenol | µg/Kg | 100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dichlorophenol | µg/Kg | 400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrotoluene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,6-Dinitrotoluene | µg/Kg | 1,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Chloronaphthalene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Chlorophenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | µg/Kg | 36,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylphenol | µg/Kg | 100 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Nitroaniline | µg/Kg | 430 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-Nitrophenol | µg/Kg | 330 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,3-Dichlorobenzidine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3-Methylphenol | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3-Nitroaniline | µg/Kg | 500 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4,6-Dinitro-2-methylphenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Bromophenyl-phenylether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Chloro-3-methylphenol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Chloroaniline | µg/Kg | 220 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Chlorophenyl-phenylether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Methylphenol | µg/Kg | 900 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Nitroaniline | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Nitrophenol | µg/Kg | 100 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | µg/Kg | 41,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aniline | µg/Kg | 100 | | | | ND | ND | ND | ND | ND | ND | | | |
| Anthracene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzidine | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Benzo(a)anthracene | µg/Kg | 224 or MDL | ND | ND | ND | ND | ND | ND | ND | **1900** | ND | ND | ND | **380** |
| Benzo(a)pyrene | µg/Kg | 61 or MDL | ND | ND | ND | ND | ND | ND | ND | **1500** | ND | ND | ND | **780** |
| Benzo(b)fluoranthene | µg/Kg | 1,100 | ND | ND | ND | ND | ND | ND | ND | 790 | ND | ND | ND | 510 |
| Benzo(g,h,i)perylene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | 1400 | ND | ND | ND | 590 |
| Benzo(k)fluoranthene | µg/Kg | 1,100 | ND | ND | ND | ND | ND | ND | ND | 800 | ND | ND | ND | 520 |
| Benzoic acid | µg/Kg | | ND | ND | ND | | | | | | | ND | ND | ND |
| Benzyl alcohol | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Chloroethoxy)methane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Chloroethyl)ether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Chloroisopropyl)ether | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis(2-Ethylhexyl)phthalate | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Butylbenzylphthalate | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | µg/Kg | 400 | ND | ND | ND | ND | ND | ND | ND | **1800** | ND | ND | ND | 400 |
| Dibenz(a,h)anthracene | µg/Kg | 14 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | µg/Kg | 6,200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diethylphthalate | µg/Kg | 71,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethylphthalate | µg/Kg | 2,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Di-n-butylphthalate | µg/Kg | 8,100 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Fluoranthene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | 3200 | ND | ND | ND | 330 |
| Fluorene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorobenzene | µg/Kg | 410 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachlorocyclopentadiene | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachloroethane | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

**Confirmatory Soil Sample Laboratory Results AOC 2/3 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | AOC 2/3 1<br>09020549-01<br>2/13/2009 | AOC 2/3 2<br>09020549-02<br>2/13/2009 | AOC 2/3 3<br>09020549-03<br>2/13/2009 | #23 Bottom<br>09040050-01<br>3/12/2009 | #18 Side<br>09040050-02<br>3/18/2009 | #18 Bottom<br>09040050-03<br>3/13/2009 | #13 Bottom<br>09040050-04<br>3/13/2009 | #10 Side<br>09040050-05<br>3/18/2009 | #7 Bottom<br>09040050-06<br>3/18/2009 | AOC 2/3 Grid 19<br>09040888-01<br>4/23/2009 | AOC 2/3 Grid 11<br>09040888-02<br>4/23/2009 | AOC 2/3 Grid 4<br>09040888-03<br>4/23/2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indeno(1,2,3-cd)pyrene | µg/Kg | 3,200 | ND | ND | ND | ND | ND | ND | ND | 1400 | ND | ND | ND | 450 |
| Isophorone | µg/Kg | 4,400 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Naphthalene | µg/Kg | 13,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Nitrobenzene | µg/Kg | 200 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| N-Nitroso-di-n-propylamine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| N-Nitrosodiphenylamine | µg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Pentachlorophenol | µg/Kg | 1000 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Phenanthrene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | ND | 1800 | ND | ND | ND | ND |
| Phenol | µg/Kg | 30 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Pyrene | µg/Kg | 50,000** | ND | ND | ND | ND | ND | ND | 800 | 2700 | ND | ND | ND | 670 |
| Pyridine | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| ***PCBs*** | | | | | | | | | | | | | | |
| Aroclor-1016 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1221 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1232 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1242 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1248 | µg/Kg | 10,000 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1254 | µg/Kg | 10,000 | ND | 30 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor-1260 | µg/Kg | 10,000 | ND | 30 | ND | ND | ND | ND | 240 | 120 | ND | ND | 0.02 | 0.02 |
| ***Herbicides*** | | | | | | | | | | | | | | |
| 2,3,5-TP Silvex | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| 2,4-D | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| ***Pesticides*** | | | | | | | | | | | | | | |
| 4,4'-DDD | µg/Kg | 2900 | | | | ND | ND | ND | ND | ND | ND | | | |
| 4,4'-DDE | µg/Kg | 2100 | | | | ND | ND | ND | ND | ND | ND | | | |
| 4,4'-DDT | µg/Kg | 2100 | | | | ND | ND | ND | ND | ND | 124 | | | |
| Aldrin | µg/Kg | 41 | | | | ND | ND | ND | ND | ND | ND | | | |
| alpha Chlordane | µg/Kg | 540 | | | | ND | ND | ND | ND | ND | ND | | | |
| alpha BHC | µg/Kg | 110 | | | | ND | ND | ND | ND | ND | ND | | | |
| beta BHC | µg/Kg | 200 | | | | ND | ND | ND | ND | ND | ND | | | |
| delta BHC | µg/Kg | 300 | | | | ND | ND | ND | ND | ND | ND | | | |
| Dieldrin | µg/Kg | 44 | | | | ND | ND | ND | ND | ND | ND | | | |
| Endosulfan I | µg/Kg | 900 | | | | ND | ND | ND | ND | ND | ND | | | |
| Endosulfan II | µg/Kg | 900 | | | | ND | ND | ND | ND | ND | ND | | | |
| Endosulfan sulfate | µg/Kg | 1000 | | | | ND | ND | ND | ND | ND | ND | | | |
| Endrin | µg/Kg | 100 | | | | ND | ND | ND | ND | ND | ND | | | |
| Endrin aldehyde | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| gamma Chlordane | µg/Kg | 540 | | | | ND | ND | ND | ND | ND | ND | | | |
| gamma-BHC (Lindane) | µg/Kg | 60 | | | | ND | ND | ND | ND | ND | ND | | | |
| Heptachlor | µg/Kg | 100 | | | | ND | ND | ND | ND | ND | ND | | | |
| Heptachlor epoxide | µg/Kg | 20 | | | | ND | ND | ND | ND | ND | ND | | | |
| Methoxychlor | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| Toxaphene | µg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| ***Metals*** | | | | | | | | | | | | | | |
| Mercury | mg/Kg | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aluminum | mg/Kg | SB | 9220 | 10200 | 25400 | | | | | | | 13900 | 16400 | 12400 |
| Antimony | mg/Kg | SB | ND | 1.38 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.95 |
| Arsenic | mg/Kg | 7.5 or SB/(5.89) | 3.35 | **41.9** | 5.5 | 5.31 | **14.7** | **27** | **10.9** | **13** | **7.52** | **16.8** | **17.2** | 7.27 |
| Barium | mg/Kg | 300 or SB/(52.5) | 28.3 | **126** | **116** | **41.9** | **107** | **133** | **72.3** | **309** | 36.9 | 132 | 136 | 58.9 |
| Beryllium | mg/Kg | 0.16 (HEAST) or SB | ND | **1.04** | **3.5** | ND | 0.13 | ND | **0.3** | **0.32** | **0.54** | **0.5** | ND | ND |
| Cadmium | mg/Kg | 1 or SB/(1.93) | ND | 1.31 | **2.45** | 0.65 | 0.67 | 1.03 | 0.77 | 0.92 | 0.54 | 0.56 | 0.52 | 0.68 |
| Calcium | mg/Kg | SB | 19600 | 27300 | 61600 | | | | | | | 20300 | 33600 | 39800 |
| Chromium | mg/Kg | 10 or SB/(15.8) | 13.3 | **35.6** | **20.9** | 14.7 | 11.5 | **19.6** | **19.6** | **22.1** | **21.9** | **15** | **26.9** | **68** |
| Cobalt | mg/Kg | 30 or SB | 8.05 | 7.33 | 8.36 | | | | | | | 7.41 | 8.13 | 9.02 |
| Copper | mg/Kg | 25 or SB | 18.9 | **265** | 15.7 | 20.2 | **28** | 6.73 | **62.3** | **117** | **36.4** | 45.8 | 33.5 | **67.7** |
| Iron | mg/Kg | 2000 or SB | 20600 | 24900 | 20000 | | | | | | | **14300** | **16100** | **28900** |
| Lead | mg/Kg | SB | 9.59 | 306 | 9.23 | 25.3 | 97.9 | 21 | 105 | 199 | 23.4 | 52.4 | 36.9 | 79.4 |
| Magnesium | mg/Kg | SB | 4450 | 9190 | 26400 | | | | | | | 12400 | 15200 | 5960 |
| Manganese | mg/Kg | SB | 442 | 545 | 938 | | | | | | | 975 | 730 | 346 |
| Nickel | mg/Kg | 13 or SB | **19.8** | **55** | **27.6** | **19.8** | **14.8** | **16.3** | **27.6** | **28** | **35.8** | **16.6** | **24.4** | **58.7** |
| Potassium | mg/Kg | SB | 980 | 774 | 1050 | | | | | | | 1110 | 856 | 790 |
| Selenium | mg/Kg | 2 or SB/(1.25) | ND | **3.21** | **5.87** | ND | ND | 1.82 | ND | ND | ND | ND | ND | ND |
| Silver | mg/Kg | SB | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sodium | mg/Kg | SB | 82.8 | 389 | 591 | | | | | | | 283 | 427 | 176 |
| Thallium | mg/Kg | SB | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vanadium | mg/Kg | 150 or SB | 15.5 | **222** | 12.1 | | | | | | | 14.4 | 12 | 15.4 |
| Zinc | mg/Kg | 20 or SB/(0.117) | **57.4** | **379** | **286** | **109** | **72.7** | **451** | **292** | **317** | **99.9** | **261** | **192** | **252** |

**Confirmatory Soil Sample Laboratory Results AOC 2/3 Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID | | | AOC 2/3 1 | AOC 2/3 2 | AOC 2/3 3 | #23 Bottom | #18 Side | #18 Bottom | #13 Bottom | #10 Side | #7 Bottom | AOC 2/3 Grid 19 | AOC 2/3 Grid 11 | AOC 2/3 Grid 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Sample No. | | NYSDEC | 09020549-01 | 09020549-02 | 09020549-03 | 09040050-01 | 09040050-02 | 09040050-03 | 09040050-04 | 09040050-05 | 09040050-06 | 09040888-01 | 09040888-02 | 09040888-03 |
| Sampling Date | | Recommended Soil Cleanup Objective Concentration[1] | 2/13/2009 | 2/13/2009 | 2/13/2009 | 3/12/2009 | 3/18/2009 | 3/13/2009 | 3/13/2009 | 3/18/2009 | 3/18/2009 | 4/23/2009 | 4/23/2009 | 4/23/2009 |
| COMPOUND | Units | | | | | | | | | | | | | |
| ***Hazardous Waste Characterisitics*** | | | | | | | | | | | | | | |
| Conductivity | umhos/cm | | | | | 8.94 | 22.6 | 8.7 | 24.2 | 24.5 | 6.46 | | | |
| Flash Point | °F | | | | | >200 | >200 | >200 | >200 | >200 | >200 | | | |
| Reactivity - Cyanide | mg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Reactivity - Sulfide | mg/Kg | | ND | ND | 44 | ND | 24.6 | 53.6 | 53.6 | ND | 53.6 | 68.1 | 23.8 | 28.4 |
| Ignitability | | | Passed | Passed | Passed | | | | | | | Passed | Passed | Passed |
| Total Petroleum Hyrocarbons-DRO | mg/Kg | | | | | 460 | ND | 80 | 8500 | 344 | 10.4 | | | |
| Total Petroleum Hyrocarbons-GRO | mg/Kg | | | | | ND | ND | ND | ND | ND | ND | | | |
| pH | S.U. | | 8.82 | 9.15 | 8.33 | 6.68 | 9.38 | 8.75 | 8.61 | 9.09 | 8.77 | 7.63 | 8.54 | 9.57 |

**Qualifiers & Notes:**

ND - The compound was not detected at the indicated concentration.

SB - Site Background

Blank cells indicate that that compound was not analyzed.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Confirmatory Soil Sample Summary of Exceedences for AOC-1**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID | | | AOC 1 (Zone 5) | AOC 1 (Zone 1) | AOC 1 (Zone 6) | AOC 1 (Zone 5) | AOC 1 (Zone 3) | AOC 1 (Sample 6) | AOC 1 (Sample 7) | AOC 1 (Sample 8) | AOC 1 (Sample 9) | AOC 1 (Sample 10) | AOC 1 (Sample 11) | AOC 1 (Sample 12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Sample No. | | | 09061029-01 | 09060750-01 | 09060750-02 | 09060750-03 | 09060750-04 | 09070468-02 | 09070468-03 | 09070468-04 | 09070468-05 | 09070468-06 | 09070468-07 | 09070468-08 |
| Sample No. on Figure | | | 5 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Sampling Date | | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | 6/29/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 6/18/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 | 7/13/2009 |
| COMPOUND | Units | | | | | | | | | | | | | |
| ***Semivolatile Organic Compounds (SVOCs)*** | | | | | | | | | | | | | | |
| Benzo(a)anthracene | µg/Kg | 224 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | 300 | **470** | **230** |
| Benzo(a)pyrene | µg/Kg | 61 or MDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **370** | ND |
| ***Metals*** | | | | | | | | | | | | | | |
| Arsenic | mg/Kg | 7.5 or SB/(5.89) | 5.04 | **6.09** | 4.04 | **11.7** | **11.9** | **7** | **6.19** | 6.46 | **7.53** | 3.05 | 4.26 | 3.3 |
| Barium | mg/Kg | 300 or SB/(52.5) | 42.9 | **71.8** | | **78.6** | **75.9** | 26.8 | 38.2 | 25.3 | **84.5** | 33.6 | 29 | 29.4 |
| Beryllium | mg/Kg | 0.16 (HEAST) or SB | **0.36** | ND | ND | 0.12 | 0.1 | **0.4** | **0.26** | 0.36 | ND | ND | 0.13 | ND |
| Cadmium | mg/Kg | 1 or SB/(1.93) | ND | 0.43 | ND | 0.65 | 0.62 | ND | ND | ND | 0.72 | 0.37 | ND | 0.3 |
| Chromium | mg/Kg | 10 or SB/(15.8) | **16.7** | 15.4 | 12.2 | **26** | **25.8** | 14.4 | 11.7 | 13.2 | **121** | **47.5** | **13.1** | **27.1** |
| Cobalt | mg/Kg | 30 or SB | | | | | | | | | | | | |
| Copper | mg/Kg | 25 or SB | **47.5** | 88.4 | 12.1 | 570 | 623 | **123** | 212 | 99.4 | **890** | **2050** | **70.7** | **1740** |
| Iron | mg/Kg | 2000 or SB | | | | | | | | | | | | |
| Nickel | mg/Kg | 13 or SB | **32** | **16.6** | **15.7** | **22.6** | **22** | **36.9** | **46.3** | **28.1** | **180** | **347** | **51.1** | **323** |
| Selenium | mg/Kg | 2 or SB/(1.25) | ND | ND | ND | ND | ND | 1.04 | **1.49** | 1.07 | **1.33** | 1.02 | ND | 1.05 |
| Vanadium | mg/Kg | 150 or SB | | | | | | | | | | | | |
| Zinc | mg/Kg | 20 or SB/(0.117) | **108** | **325** | **50** | **264** | **281** | **98** | **220** | **86.3** | **362** | **476** | **75** | **352** |

**Qualifiers & Notes:**

ND - The compound was not detected at the indicated concentration.

SB - Site Background

Blank cells indicate that that compound was not analyzed.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Confirmatory Soil Sample Summary of Exceedences for AOC-2/3**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | AOC 2/3 1<br>09020549-01<br>2/13/2009 | AOC 2/3 2<br>09020549-02<br>2/13/2009 | AOC 2/3 3<br>09020549-03<br>2/13/2009 | #23 Bottom<br>09040050-01<br>3/12/2009 | #18 Side<br>09040050-02<br>3/18/2009 | #18 Bottom<br>09040050-03<br>3/13/2009 | #13 Bottom<br>09040050-04<br>3/13/2009 | #10 Side<br>09040050-05<br>3/18/2009 | #7 Bottom<br>09040050-06<br>3/18/2009 | AOC 2/3 Grid 19<br>09040888-01<br>4/23/2009 | AOC 2/3 Grid 11<br>09040888-02<br>4/23/2009 | AOC 2/3 Grid 4<br>09040888-03<br>4/23/2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Semivolatile Organic Compounds (SVOCs)*** | | | | | | | | | | | | | | |
| Benzo(a)anthracene | µg/Kg | 224 or MDL | ND | ND | ND | ND | ND | ND | ND | **1900** | ND | ND | ND | **380** |
| Benzo(a)pyrene | µg/Kg | 61 or MDL | ND | ND | ND | ND | ND | ND | ND | **1500** | ND | ND | ND | **780** |
| Chrysene | µg/Kg | 400 | ND | ND | ND | ND | ND | ND | ND | **1800** | ND | ND | ND | 400 |
| ***Metals*** | | | | | | | | | | | | | | |
| Arsenic | mg/Kg | 7.5 or SB/(5.89) | 3.35 | **41.9** | 5.5 | 5.31 | **14.7** | **27** | **10.9** | **13** | **7.52** | **16.8** | **17.2** | 7.27 |
| Barium | mg/Kg | 300 or SB/(52.5) | 28.3 | **126** | **116** | **41.9** | **107** | **133** | **72.3** | **309** | 36.9 | 132 | 136 | 58.9 |
| Beryllium | mg/Kg | 0.16 (HEAST) or SB | ND | **1.04** | **3.5** | ND | 0.13 | ND | **0.3** | **0.32** | **0.54** | **0.5** | ND | ND |
| Cadmium | mg/Kg | 1 or SB/(1.93) | ND | 1.31 | **2.45** | 0.65 | 0.67 | 1.03 | 0.77 | 0.92 | 0.54 | 0.56 | 0.52 | 0.68 |
| Chromium | mg/Kg | 10 or SB/(15.8) | 13.3 | **35.6** | **20.9** | 14.7 | 11.5 | **19.6** | **19.6** | **22.1** | **21.9** | **15** | **26.9** | **68** |
| Cobalt | mg/Kg | 30 or SB | 8.05 | 7.33 | 8.36 | | | | | | | 7.41 | 8.13 | 9.02 |
| Copper | mg/Kg | 25 or SB | 18.9 | **265** | 15.7 | 20.2 | **28** | 6.73 | **62.3** | **117** | **36.4** | 45.8 | 33.5 | **67.7** |
| Iron | mg/Kg | 2000 or SB | 20600 | 24900 | 20000 | | | | | | | **14300** | **16100** | **28900** |
| Nickel | mg/Kg | 13 or SB | **19.8** | **55** | **27.6** | **19.8** | **14.8** | **16.3** | **27.6** | **28** | **35.8** | **16.6** | **24.4** | **58.7** |
| Selenium | mg/Kg | 2 or SB/(1.25) | ND | **3.21** | **5.87** | ND | ND | 1.82 | ND | ND | ND | ND | ND | ND |
| Vanadium | mg/Kg | 150 or SB | 15.5 | **222** | 12.1 | | | | | | | 14.4 | 12 | 15.4 |
| Zinc | mg/Kg | 20 or SB/(0.117) | **57.4** | **379** | **286** | **109** | **72.7** | **451** | **292** | **317** | **99.9** | **261** | **192** | **252** |

**Qualifiers & Notes:**

ND - The compound was not detected at the indicated concentration.

SB - Site Background

Blank cells indicate that that compound was not analyzed.

1. Shaded values exceed TAGM 4046 Recommended Cleanup Objectives for Subsurface Soil.

**Confirmatory Soil Sample Laboratory Results Statistical Summary**
DeLaval Property
Pine Street and Rinaldi Boulevard

| Sample ID<br>Laboratory Sample No.<br>Sampling Date<br>COMPOUND | Units | NYSDEC Recommended Soil Cleanup Objective Concentration[1] | MAX AOC 1 | MIN AOC 1 | MAX AOC 2/3 | MIN AOC 2/3 | Frequency of exceeding TAGM AOC 1 | Frequency of exceeding TAGM AOC 2/3 |
|---|---|---|---|---|---|---|---|---|
| ***Volatile Organic Compounds (VOCs)*** | | | | | | | | |
| Napthalene | µg/Kg | 13,000 | 92 | 92 | 630 | 630 | 0 | 0 |
| sec-Butylbenzene | µg/Kg | | 72 | 72 | 0 | 0 | 0 | 0 |
| Tetrachloroethene | µg/Kg | 1,400 | | | 36 | 36 | | 0 |
| ***Semivolatile Organic Compounds (SVOCs)*** | | | | | | | | |
| Benzo(a)anthracene | µg/Kg | 224 or MDL | 470 | 230 | 1900 | 380 | 2 | 2 |
| Benzo(a)pyrene | µg/Kg | 61 or MDL | 370 | 370 | 1500 | 780 | 2 | 2 |
| Benzo(b)fluoranthene | µg/Kg | 1,100 | 360 | 360 | 790 | 510 | 0 | 0 |
| Benzo(g,h,i)perylene | µg/Kg | 50,000** | 0 | 0 | 1400 | 590 | 0 | 0 |
| Benzo(k)fluoranthene | µg/Kg | 1,100 | 330 | 330 | 800 | 520 | 0 | 0 |
| Chrysene | µg/Kg | 400 | 340 | 340 | 1800 | 400 | 0 | 1 |
| Fluoranthene | µg/Kg | 50,000** | 930 | 320 | 3200 | 330 | 0 | 0 |
| Indeno(1,2,3-cd)pyrene | µg/Kg | 3,200 | 0 | 0 | 1400 | 450 | 0 | 0 |
| Phenanthrene | µg/Kg | 50,000** | 220 | 220 | 1800 | 1800 | 0 | 0 |
| Pyrene | µg/Kg | 50,000** | 780 | 290 | 2700 | 670 | 0 | 0 |
| ***PCBs*** | | | | | | | | |
| Aroclor-1254 | µg/Kg | 10,000 | 0.289 | 0.054 | 30 | 30 | 0 | 0 |
| Aroclor-1260 | µg/Kg | 10,000 | 0.538 | 0.089 | 240 | 0.02 | 0 | 0 |
| ***Pesticides*** | | | | | | | | |
| 4,4'-DDT | µg/Kg | 2100 | 0 | 0 | 124 | 124 | 0 | 0 |
| ***Metals*** | | | | | | | | |
| Aluminum | mg/Kg | SB | | | 25400 | 9220 | | 0 |
| Antimony | mg/Kg | SB | 3.38 | 0.81 | 1.95 | 1.38 | 0 | 0 |
| Arsenic | mg/Kg | 7.5 or SB/(5.89) | 11.9 | 3.05 | 41.9 | 3.35 | 7 | 8 |
| Barium | mg/Kg | 300 or SB/(52.5) | 84.5 | 25.3 | 309 | 28.3 | 4 | 7 |
| Beryllium | mg/Kg | 0.16 (HEAST) or SB | 0.4 | 0.1 | 3.5 | 0.13 | 3 | 6 |
| Cadmium | mg/Kg | 1 or SB/(1.93) | 0.72 | 0.3 | 2.45 | 0.52 | 0 | 1 |
| Calcium | mg/Kg | SB | | | 61600 | 19600 | | 0 |
| Chromium | mg/Kg | 10 or SB/(15.8) | 121 | 11.7 | 68 | 11.5 | 8 | 9 |
| Cobalt | mg/Kg | 30 or SB | | | 9.02 | 7.33 | | 0 |
| Copper | mg/Kg | 25 or SB | 2050 | 12.1 | 265 | 6.73 | 6 | 6 |
| Iron | mg/Kg | 2000 or SB | | | 28900 | 14300 | | 3 |
| Lead | mg/Kg | SB | 201 | 8.22 | 306 | 9.23 | 0 | 0 |
| Magnesium | mg/Kg | SB | | | 26400 | 4450 | | 0 |
| Manganese | mg/Kg | SB | | | 975 | 346 | | 0 |
| Nickel | mg/Kg | 13 or SB | 347 | 15.7 | 58.7 | 14.8 | 13 | 12 |
| Potassium | mg/Kg | SB | | | 1110 | 774 | | 0 |
| Selenium | mg/Kg | 2 or SB/(1.25) | 1.49 | 1.02 | 5.87 | 1.82 | 2 | 2 |
| Silver | mg/Kg | SB | 0.5 | 0.33 | 0 | 0 | 0 | 0 |
| Sodium | mg/Kg | SB | | | 591 | 82.8 | | 0 |
| Thallium | mg/Kg | SB | 0 | 0 | 0 | 0 | 0 | 0 |
| Vanadium | mg/Kg | 150 or SB | | | 222 | 12 | | 1 |
| Zinc | mg/Kg | 20 or SB/(0.117) | 476 | 50 | 451 | 57.4 | 13 | 12 |
| ***Hazardous Waste Characterisitics*** | | | | | | | | |
| Conductivity | umhos/cm | | 55 | 1.72 | 24.5 | 6.46 | 0 | 0 |
| Flash Point | °F | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reactivity - Cyanide | mg/Kg | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reactivity - Sulfide | mg/Kg | | 43 | 16 | 68.1 | 23.8 | 0 | 0 |
| Ignitability | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Petroleum Hyrocarbons-DRO | mg/Kg | | 410 | 39 | 8500 | 10.4 | 0 | 0 |
| Total Petroleum Hyrocarbons-GRO | mg/Kg | | 35 | 4 | 0 | 0 | 0 | 0 |
| pH | S.U. | | 8.59 | 6.58 | 9.57 | 6.68 | 0 | 0 |

**Notes:**
SB - Site Background
Blank cells indicate that that compound was not analyzed.

# APPENDIX C

## Material Safety Data Sheets

MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades** **MSDS No. 9950**

**EMERGENCY OVERVIEW**
**DANGER!**
**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT - EFFECTS 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.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

## 1. CHEMICAL PRODUCT and COMPANY INFORMATION

**Hess Corporation**
**1 Hess Plaza**
**Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER (24 hrs):** **CHEMTREC (800)424-9300**
**COMPANY CONTACT (business hours):** Corporate Safety (732)750-6000
**MSDS (Environment, Health, Safety) Internet Website** www.hess.com

**SYNONYMS**: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

## 2. COMPOSITION and INFORMATION ON INGREDIENTS *

| INGREDIENT NAME (CAS No.) | CONCENTRATION PERCENT BY WEIGHT |
|---|---|
| Gasoline (86290-81-5) | 100 |
| Benzene (71-43-2) | 0.1 - 4.9 (0.1 - 1.3 reformulated gasoline) |
| n-Butane (106-97-8) | < 10 |
| Ethyl Alcohol (Ethanol) (64-17-5) | 0 - 10 |
| Ethyl benzene (100-41-4) | < 3 |
| n-Hexane (110-54-3) | 0.5 to 4 |
| Methyl-tertiary butyl ether (MTBE) (1634-04-4) | 0 to 15.0 |
| Tertiary-amyl methyl ether (TAME) (994-05-8) | 0 to 17.2 |
| Toluene (108-88-3) | 1 - 25 |
| 1,2,4- Trimethylbenzene (95-63-6) | < 6 |
| Xylene, mixed isomers (1330-20-7) | 1 - 15 |

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).

Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

## 3. HAZARDS IDENTIFICATION

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

**SKIN**
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. 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 irritations 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.

**WARNING**: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

**CHRONIC EFFECTS and CARCINOGENICITY**
Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing 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: | -45 $^{o}$F (-43$^{o}$C) |
| AUTOIGNITION TEMPERATURE: | highly variable; > 530 $^{o}$F (>280 $^{o}$C) |
| OSHA/NFPA FLAMMABILITY CLASS: | 1A (flammable liquid) |
| LOWER EXPLOSIVE LIMIT (%): | 1.4% |
| UPPER EXPLOSIVE LIMIT (%): | 7.6% |

**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.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 “Low Expansion Foam - 1994 Edition.”

**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. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

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.

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

## 7. HANDLING and STORAGE

**HANDLING PRECAUTIONS**

******USE ONLY AS A MOTOR FUEL******
******DO NOT SIPHON BY MOUTH******

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

| Component (CAS No.) | Source | TWA (ppm) | STEL (ppm) | Exposure Limits Note |
|---|---|---|---|---|
| Gasoline (86290-81-5) | ACGIH | 300 | 500 | A3 |
| Benzene (71-43-2) | OSHA | 1 | 5 | Carcinogen |
| | ACGIH | 0.5 | 2.5 | A1, skin |
| | USCG | 1 | 5 | |
| n-Butane (106-97-8) | ACGIH | 1000 | -- | Aliphatic Hydrocarbon Gases Alkane (C1-C4) |
| Ethyl Alcohol (ethanol) (64-17-5) | OSHA | 1000 | -- | |
| | ACGIH | 1000 | -- | A4 |
| Ethyl benzene (100-41-4) | OSHA | 100 | -- | |
| | ACGIH | 100 | 125 | A3 |
| n-Hexane (110-54-3) | OSHA | 500 | -- | |
| | ACGIH | 50 | -- | Skin |
| Methyl-tertiary butyl ether [MTBE] (1634-04-4) | ACGIH | 50 | | A3 |
| Tertiary-amyl methyl ether [TAME] (994-05-8) | | | | None established |
| Toluene (108-88-3) | OSHA | 200 | | Ceiling: 300 ppm; Peak: 500 ppm (10 min.) |
| | ACGIH | 20 | -- | A4 |
| 1,2,4- Trimethylbenzene (95-63-6) | ACGIH | 25 | -- | |
| Xylene, mixed isomers (1330-20-7) | OSHA | 100 | -- | |
| | ACGIH | 100 | 150 | A4 |

### 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 that made of of E.I. DuPont Tychem ®, products or equivalent is 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, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

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 translucent, straw-colored or light yellow liquid

**ODOR**
A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

**ODOR THRESHOLD**

| | Odor Detection | Odor Recognition |
|---|---|---|
| Non-oxygenated gasoline: | 0.5 - 0.6 ppm | 0.8 - 1.1 ppm |
| Gasoline with 15% MTBE: | 0.2 - 0.3 ppm | 0.4 - 0.7 ppm |
| Gasoline with 15% TAME: | 0.1 ppm | 0.2 ppm |

**BASIC PHYSICAL PROPERTIES**

| | |
|---|---|
| BOILING RANGE: | 85 to 437 $^{o}$F (39 to 200 $^{o}$C) |
| VAPOR PRESSURE: | 6.4 - 15 RVP @ 100 $^{o}$F (38 $^{o}$C) (275-475 mm Hg @ 68 $^{o}$F (20 $^{o}$C) |
| VAPOR DENSITY (air = 1): | AP 3 to 4 |
| SPECIFIC GRAVITY ($H_2O$ = 1): | 0.70 – 0.78 |
| EVAPORATION RATE: | 10-11 (n-butyl acetate = 1) |
| PERCENT VOLATILES: | 100 % |
| SOLUBILITY ($H_2O$): | Non-oxygenated gasoline - negligible (< 0.1% @ 77 $^{o}$F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 $^{o}$F); ethanol is readily soluble in water |

## 10. STABILITY and REACTIVITY )

**STABILITY:** Stable. Hazardous polymerization will not occur.

**CONDITIONS TO AVOID**
Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

**INCOMPATIBLE MATERIALS**
Keep away from strong oxidizers.

**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 Dermal LD50 (rabbits): > 5 ml/kg
Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating
Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative

**CHRONIC EFFECTS AND CARCINOGENICITY**
Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE ): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

## 12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

## 13. DISPOSAL CONSIDERATIONS

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

## 14. TRANSPORTATION INFORMATION

| | |
|---|---|
| DOT PROPER SHIPPING NAME: | Gasoline |
| DOT HAZARD CLASS and PACKING GROUP: | 3, PG II |
| DOT IDENTIFICATION NUMBER: | UN 1203 |
| DOT SHIPPING LABEL: | FLAMMABLE LIQUID |

PLACARD:


## 15. REGULATORY INFORMATION

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

This product and its constituents listed herein are on the EPA TSCA Inventory. 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 federal, state, or local regulations; 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)**

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**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 |
|---|---|
| Benzene (71-43-2) | 0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline) |
| Ethyl benzene (100-41-4) | < 3 |

| | |
|---|---|
| n-Hexane (110-54-3) | 0.5 to 4 |
| Methyl-tertiary butyl ether (MTBE) (1634-04-4) | 0 to 15.0 |
| Toluene (108-88-3) | 1 to 15 |
| 1,2,4- Trimethylbenzene (95-63-6) | < 6 |
| Xylene, mixed isomers (1330-20-7) | 1 to 15 |

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

| INGREDIENT NAME (CAS NUMBER) | CONCENTRATION - Parts per million (ppm) by weight |
|---|---|
| Polycyclic aromatic compounds (PACs) | 17 |
| Benzo (g,h,i) perylene (191-24-2) | 2.55 |
| Lead (7439-92-1) | 0.079 |

**CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS**

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

| INGREDIENT NAME (CAS NUMBER) | Date Listed |
|---|---|
| Benzene | 2/27/1987 |
| Ethyl benzene | 6/11/2004 |
| Toluene | 1/1/1991 |

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

## 16. OTHER INFORMATION

| | | | |
|---|---|---|---|
| **NFPA® HAZARD RATING** | HEALTH: | 1 | Slight |
| | FIRE: | 3 | Serious |
| | REACTIVITY: | 0 | Minimal |
| **HMIS® HAZARD RATING** | HEALTH: | 1 * | Slight |
| | FIRE: | 3 | Serious |
| | PHYSICAL: | 0 | Minimal |
| | | | * CHRONIC |

**SUPERSEDES MSDS DATED: 07/01/06**

**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 | CERCLA | Comprehensive Emergency Response, Compensation, and Liability Act |
| AIHA | American Industrial Hygiene Association | DOT | U.S. Department of Transportation [General Info: (800)467-4922] |
| ANSI | American National Standards Institute (212)642-4900 | EPA | U.S. Environmental Protection Agency |
| API | American Petroleum Institute (202)682-8000 | HMIS | Hazardous Materials Information System |

| | | | |
|---|---|---|---|
| IARC | International Agency For Research On Cancer | REL | Recommended Exposure Limit (NIOSH) |
| MSHA | Mine Safety and Health Administration | SARA | Superfund Amendments and Reauthorization Act of 1986 Title III |
| NFPA | National Fire Protection Association (617)770-3000 | SCBA | Self-Contained Breathing Apparatus |
| NIOSH | National Institute of Occupational Safety and Health | SPCC | Spill Prevention, Control, and Countermeasures |
| NOIC | Notice of Intended Change (proposed change to ACGIH TLV) | STEL | Short-Term Exposure Limit (generally 15 minutes) |
| NTP | National Toxicology Program | TLV | Threshold Limit Value (ACGIH) |
| OPA | Oil Pollution Act of 1990 | TSCA | Toxic Substances Control Act |
| OSHA | U.S. Occupational Safety & Health Administration | TWA | Time Weighted Average (8 hr.) |
| PEL | Permissible Exposure Limit (OSHA) | WEEL | Workplace Environmental Exposure Level (AIHA) |
| RCRA | Resource Conservation and Recovery Act | WHMIS | Workplace Hazardous Materials Information System (Canada) |

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

MATERIAL SAFETY DATA SHEET

# Diesel Fuel (All Types)

**MSDS No. 9909**

**EMERGENCY OVERVIEW**
**CAUTION!**
**OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT**
**EFFECTS CENTRAL NERVOUS SYSTEM**
**HARMFUL OR FATAL IF SWALLOWED**

**Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.**
**If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).**


NFPA 704 (Section 16)

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Hess Corporation**
**1 Hess Plaza**
**Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER (24 hrs):** **CHEMTREC (800) 424-9300**
**COMPANY CONTACT (business hours):** Corporate Safety (732) 750-6000
**MSDS INTERNET WEBSITE:** www.hess.com (See Environment, Health, Safety & Social Responsibility)

**SYNONYMS:** Ultra Low Sulfur Diesel (ULSD); Low Sulfur Diesel; Motor Vehicle Diesel Fuel; Diesel Fuel #2; Dyed Diesel Fuel; Non-Road, Locomotive and Marine Diesel Fuel; Tax-exempt Diesel Fuel

See Section 16 for abbreviations and acronyms.

## 2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

| INGREDIENT NAME (CAS No.) | CONCENTRATION PERCENT BY WEIGHT |
|---|---|
| Diesel Fuel (68476-34-6) | 100 |
| Naphthalene (91-20-3) | Typically < 0.01 |

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher. Diesel fuel may be dyed (red) for tax purposes. May contain a multifunctional additive.

## 3. HAZARDS IDENTIFICATION

**EYES**
Contact with liquid or vapor may cause mild irritation.

**SKIN**
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 repeatedly exposed.

**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 irritations 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.

**WARNING**: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

**CHRONIC EFFECTS and CARCINOGENICITY**
Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information.

IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A). NIOSH regards whole diesel fuel exhaust particulates as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

## 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. Monitor for breathing difficulties. 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 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: | > 125 $^{o}$F (> 52 $^{o}$C) minimum PMCC |
| AUTOIGNITION POINT: | 494 $^{o}$F (257 $^{o}$C) |
| OSHA/NFPA FLAMMABILITY CLASS: | 2 (COMBUSTIBLE) |
| LOWER EXPLOSIVE LIMIT (%): | 0.6 |
| UPPER EXPLOSIVE LIMIT (%): | 7.5 |

**FIRE AND EXPLOSION HAZARDS**
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. 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'S SPILL CONTINGENCY OR EMERGENCY RESPONSE 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. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

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.

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

## 7. HANDLING and STORAGE

**HANDLING PRECAUTIONS**

Handle as a combustible 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.

Diesel fuel, and in particular low and ultra low sulfur diesel fuel, has the capability of accumulating a static electrical charge of sufficient energy to cause a fire/explosion in the presence of lower flashpoint products such as gasoline. The accumulation of such a static charge occurs as the diesel flows through pipelines, filters, nozzles and various work tasks such as tank/container filling, splash loading, tank cleaning; product sampling; tank gauging; cleaning, mixing, vacuum truck operations, switch loading, and product agitation. There is a greater potential for static charge accumulation in cold temperature, low humidity conditions.

Documents such as 29 CFR OSHA 1910.106 "Flammable and Combustible Liquids, NFPA 77 Recommended Practice on Static Electricity, API 2003 "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents and ASTM D4865 "Standard Guide for Generation and Dissipation of Static

Electricity in Petroleum Fuel Systems" address special precautions and design requirements involving loading rates, grounding, bonding, filter installation, conductivity additives and especially the hazards associated with "switch loading." ["Switch Loading" is when a higher flash point product (such as diesel) is loaded into tanks previously containing a low flash point product (such as gasoline) and the electrical charge generated during loading of the diesel results in a static ignition of the vapor from the previous cargo (gasoline).]

Note: When conductivity additives are used or are necessary the product should achieve 25 picosiemens/meter or greater at the handling temperature.

**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 |
|---|---|---|---|
| Diesel Fuel: (68476-34-6) | OSHA | 5 mg/m, as mineral oil mist | |
| | ACGIH | 100 mg/m$^3$ (as totally hydrocarbon vapor) TWA | A3, skin |
| Naphthalene (91-20-3) | OSHA | 10 ppm TWA | |
| | ACGIH | 10 ppm TWA / 15 ppm STEL | A4, Skin |

**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, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® 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/MSHA-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, 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**
Clear, straw-yellow liquid. Dyed fuel oil will be red or reddish-colored.

**ODOR**
Mild, petroleum distillate odor

**BASIC PHYSICAL PROPERTIES**

| | |
|---|---|
| BOILING RANGE: | 320 to 690 oF (160 to 366 $^{o}$C) |
| VAPOR PRESSURE: | 0.009 psia @ 70 $^{o}$F (21 $^{o}$C) |
| VAPOR DENSITY (air = 1): | > 1.0 |
| SPECIFIC GRAVITY ($H_2O$ = 1): | 0.83 to 0.88 @ 60 $^{o}$F (16 $^{o}$C) |
| PERCENT VOLATILES: | 100 % |
| EVAPORATION RATE: | Slow; varies with conditions |
| SOLUBILITY ($H_2O$): | Negligible |

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable. Hazardous polymerization will not occur.

**CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS**
Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers; Viton ®; Fluorel ®

**HAZARDOUS DECOMPOSITION PRODUCTS**
Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

## 11. TOXICOLOGICAL PROPERTIES

**ACUTE TOXICITY**
Acute dermal LD50 (rabbits): > 5 ml/kg
Acute oral LD50 (rats): 9 ml/kg
Primary dermal irritation: extremely irritating (rabbits)
Draize eye irritation: non-irritating (rabbits)
Guinea pig sensitization: negative

**CHRONIC EFFECTS AND CARCINOGENICITY**
Carcinogenic: OSHA: NO IARC: NO NTP: NO ACGIH: A3

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

**MUTAGENICITY (genetic effects)**
This material has been positive in a mutagenicity study.

## 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

| | | |
|---|---|---|
| PROPER SHIPPING NAME: | Diesel Fuel | Placard (International Only): |
| HAZARD CLASS and PACKING GROUP: | 3, PG III | |
| DOT IDENTIFICATION NUMBER: | NA 1993 (Domestic)<br>UN 1202 (International) | |
| DOT SHIPPING LABEL: | None | |


Use Combustible Placard if shipping in bulk domestically

## 15. REGULATORY INFORMATION

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

This product and its constituents listed herein are on the EPA TSCA Inventory. 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)**

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**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 may contain listed chemicals below the *de minimis* levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

**CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS**

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

| INGREDIENT NAME (CAS NUMBER) | Date Listed |
|---|---|
| Diesel Engine Exhaust (no CAS Number listed) | 10/01/1990 |

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Class B, Division 3 (Combustible Liquid) and Class D, Division 2, Subdivision B (Toxic by other means)

## 16. OTHER INFORMATION

**NFPA® HAZARD RATING** HEALTH: 0
FIRE: 2
REACTIVITY: 0

Refer to NFPA 704 "Identification of the Fire Hazards of Materials" for further information

**HMIS® HAZARD RATING** HEALTH: 1 * * Chronic
FIRE: 2
PHYSICAL: 0

**SUPERSEDES MSDS DATED:** 02/28/2001

**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 |

MATERIAL SAFETY DATA SHEET

**Hess 5W30 Motor Oil** **MSDS No. 9683**

**EMERGENCY OVERVIEW**
**CAUTION!**
**OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT**
**EFFECTS CENTRAL NERVOUS SYSTEM**
**HARMFUL OR FATAL IF SWALLOWED**

**Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.**
**If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).**

NFPA 704 (Section 16)

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Hess Corporation**
**1 Hess Plaza**
**Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER:** **VALVOLINE: 800-247-5263**
**COMPANY CONTACT (business hours):** Valvoline Info: 606-357-7847
Corporate EHS 732-750-6000
**MSDS Internet Website:** www.hess.com

**SYNONYMS:** Valvoline Product Code 52670453

This product is manufactured by The Valvoline Company and packaged under the Amerada Hess ("Hess") label. The information in this MSDS has been developed by The Valvoline Company, MSDS No. 505.0172013-013.002I, date 5/11/99.

See Section 16 for abbreviations and acronyms.

## 2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

| INGREDIENT NAME (CAS No.) | CONCENTRATION PERCENT BY WEIGHT |
|---|---|
| Aliphatic Petroleum Distillates (64742-65-0) | 83.0 – 93.0 |
| Detergent/ Dispersant Engine Oil Package | N/A |
| Zinc Compounds | N/A |

Petroleum-based lubricating oil with detergent/dispersant engine oil package with zinc compounds.

## 3. HAZARDS IDENTIFICATION

**EYES**
May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

**SKIN**
May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms include redness, burning, drying and cracking of the skin, and skin burns. Additional symptoms of skin contact include: acne. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

**INGESTION**
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

**INHALATION**
It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits.

**CHRONIC EFFECTS and CARCINOGENICITY**
This material is not listed as a carcinogen by IARC, NTP, or OSHA. Used motor oil has been shown to cause skin cancer in laboratory animal continually exposed by repeated applications. Avoid prolonged or repeated skin contact.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

## 4. FIRST AID MEASURES

**EYES**
If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is visual difficulty, seek medical attention.

**SKIN**
Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

**INGESTION**
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

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

**Note to Physicians**
Acute aspiration of large amounts of oil-laden material may produce a serious aspiration hazard. Patients who aspirate these oils should be followed for the development of long-term sequelae. Repeated aspiration of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin.

## 5. FIRE FIGHTING MEASURES

**FLAMMABLE PROPERTIES:**

| | |
|---|---|
| FLASH POINT: | 410.0 $^{o}$F (210.0 $^{o}$C) COC |
| AUTOIGNITION POINT: | No data |
| EXPLOSIVE LIMITS (%): | No data |

**FIRE AND EXPLOSION HAZARDS**
Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. No special fire hazards are known to be associated with this product. Dense smoke may be generated while burning.

**HAZARDOUS PRODUCTS OF COMBUSTION**
May form: carbon dioxide and carbon monoxide, oxides of sulfur, nitrogen and phosphorous, various hydrocarbons.

**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'S SPILL CONTINGENCY OR EMERGENCY RESPONSE 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. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

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.

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

SMALL SPILL: Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.

LARGE SPILL: Prevent run-off to sewers, streams, or other bodies of water. If run-off occurs, notify authorities as required, that a spill has occurred. Persons not wearing proper personal protective equipment should be excluded from area of spill until clean-up has been completed.

## 7. HANDLING and STORAGE

### HANDLING PRECAUTIONS

Handle as a combustible 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 |
|---|---|---|---|
| Aliphatic Petroleum Distillates | OSHA | 5 mg/m, as mineral oil mist | |
| (64742-65-0) | ACGIH | 5 mg/m, as mineral oil mist | |

### 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**
Not normally required. However, wear resistant gloves such as nitrile rubber to prevent irritation which may result from prolonged or repeated skin contact with product. To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Wear normal work clothing covering arms and legs..

**RESPIRATORY PROTECTION**
A NIOSH/MSHA-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, 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**
Dry, clear, and bright liquid

**ODOR**
No data

**BASIC PHYSICAL PROPERTIES**

| | |
|---|---|
| BOILING RANGE: | (for component) > 425.0 F (218.3 C) @ 760.00 mmHg |
| VAPOR PRESSURE: | No data |
| VAPOR DENSITY (air = 1): | No data |
| LIQUID DENSITY: | 7.300 lbs/gal @ 60.00 F (.876 kg/l @ 15.60 C ) |
| SPECIFIC GRAVITY ($H_2O$ = 1): | 0.876 @ 60F |
| PERCENT VOLATILES: | No data |
| EVAPORATION RATE: | Slower than ethyl ether |
| pH: | No data |
| VISCOSITY: | <= 3300.0 cps @ -25 C; 10.5 - 11.2 cst @ 100 C |

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable. Hazardous polymerization will not occur.

**CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS**
Avoid contact with: acids, halogens, strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS**
May form: aldehydes, carbon dioxide and carbon monoxide, hydrogen sulfide, oxides of sulfur, nitrogen and phosphorus, toxic fumes, various hydrocarbons.

## 11. TOXICOLOGICAL PROPERTIES

No data

## 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

| | |
|---|---|
| PROPER SHIPPING NAME: | None |
| HAZARD CLASS and PACKING GROUP: | None |
| DOT IDENTIFICATION NUMBER: | None |
| DOT SHIPPING LABEL: | None |

## 15. REGULATORY INFORMATION

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

This product and its constituents listed herein are on the EPA TSCA Inventory. 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)**

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**SARA SECTION 311/312 - HAZARD CLASSES**

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

**SARA SECTION 313 - SUPPLIER NOTIFICATION**

ZINC C1-C14 ALKYLDITHIOPHOSPHATE (CAS No. 68649-42-3)

**CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS**

This product and its components are not listed on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Not controlled

## 16. OTHER INFORMATION

| | | |
|---|---|---|
| **NFPA® HAZARD RATING** | HEALTH: | 1 |
| | FIRE: | 1 |
| | REACTIVITY: | 0 |

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

| | | | |
|---|---|---|---|
| **HMIS® HAZARD RATING** | HEALTH: | 1 * | Slight |
| | FIRE: | 1 | Slight |
| | PHYSICAL: | 0 | Negligible |

* Chronic

**SUPERSEDES MSDS DATED:** 05/11/1999

**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 |

MATERIAL SAFETY DATA SHEET

**Hess 10W30 Motor Oil** **MSDS No. 8957**

**EMERGENCY OVERVIEW**
**CAUTION!**
**OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT**
**EFFECTS CENTRAL NERVOUS SYSTEM**
**HARMFUL OR FATAL IF SWALLOWED**

**Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.**
**If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).**

NFPA 704 (Section 16)

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Hess Corporation**
**1 Hess Plaza**
**Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER:** **VALVOLINE: 800-247-5263**
**COMPANY CONTACT (business hours):** Valvoline Info: 606-357-7847
Corporate EHS 732-750-6000
**MSDS Internet Website:** www.hess.com

**SYNONYMS:** Valvoline Product Code 52670413

This product is manufactured by The Valvoline Company and packaged under the Amerada Hess ("Hess") label. The information in this MSDS has been developed by The Valvoline Company, MSDS No. 505.0170829-014.002I, date 5/11/99.

See Section 16 for abbreviations and acronyms.

## 2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

| INGREDIENT NAME (CAS No.) | CONCENTRATION PERCENT BY WEIGHT |
|---|---|
| Aliphatic Petroleum Distillates (64742-65-0) | 83.0 – 93.0 |
| Detergent/ Dispersant Engine Oil Package | N/A |
| Zinc Compounds | N/A |

Petroleum-based lubricating oil with detergent/dispersant engine oil package with zinc compounds.

## 3. HAZARDS IDENTIFICATION

**EYES**
May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

**SKIN**
May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms include redness, burning, drying and cracking of the skin, and skin burns. Additional symptoms of skin contact include: acne. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

**INGESTION**

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

**INHALATION**
It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits.

**CHRONIC EFFECTS and CARCINOGENICITY**
This material is not listed as a carcinogen by IARC, NTP, or OSHA. Used motor oil has been shown to cause skin cancer in laboratory animal continually exposed by repeated applications. Avoid prolonged or repeated skin contact.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

## 4. FIRST AID MEASURES

**EYES**
If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is visual difficulty, seek medical attention.

**SKIN**
Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

**INGESTION**
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

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

**Note to Physicians**
Acute aspiration of large amounts of oil-laden material may produce a serious aspiration hazard. Patients who aspirate these oils should be followed for the development of long-term sequelae. Repeated aspiration of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin.

## 5. FIRE FIGHTING MEASURES

**FLAMMABLE PROPERTIES:**

| | |
|---|---|
| FLASH POINT: | 430.0 $^{o}$F (221.1 $^{o}$C) COC |
| AUTOIGNITION POINT: | No data |
| EXPLOSIVE LIMITS (%): | No data |

**FIRE AND EXPLOSION HAZARDS**

Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. No special fire hazards are known to be associated with this product. Dense smoke may be generated while burning.

**HAZARDOUS PRODUCTS OF COMBUSTION**

May form: carbon dioxide and carbon monoxide, oxides of sulfur, nitrogen and phosphorous, various hydrocarbons.

**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'S SPILL CONTINGENCY OR EMERGENCY RESPONSE 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. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

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.

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

SMALL SPILL: Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.

LARGE SPILL: Prevent run-off to sewers, streams, or other bodies of water. If run-off occurs, notify authorities as required, that a spill has occurred. Persons not wearing proper personal protective equipment should be excluded from area of spill until clean-up has been completed.

## 7. HANDLING and STORAGE

### HANDLING PRECAUTIONS

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five gallon pails and larger metal containers including tank cars and tank trucks should be grounded and/or bonded when material is transferred. Precautions during use: avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

### 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 |
|---|---|---|---|
| Aliphatic Petroleum Distillates | OSHA | 5 mg/m, as mineral oil mist | |
| (64742-65-0) | ACGIH | 5 mg/m, as mineral oil mist | |

**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**
Not normally required. However, wear resistant gloves such as nitrile rubber to prevent irritation which may result from prolonged or repeated skin contact with product. To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Wear normal work clothing covering arms and legs..

**RESPIRATORY PROTECTION**
A NIOSH/MSHA-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, 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**
Dry, clear, and bright liquid

**ODOR**
No data

**BASIC PHYSICAL PROPERTIES**

| | |
|---|---|
| BOILING RANGE: | (for component) > 425.0 F (218.3 C) @ 760.00 mmHg |
| VAPOR PRESSURE: | Not applicable |
| VAPOR DENSITY (air = 1): | No data |
| LIQUID DENSITY: | 7.340 lbs/gal @ 60.00 F (.881 kg/l @ 15.60 C ) |
| SPECIFIC GRAVITY ($H_2O$ = 1): | 0.881 @ 60F |
| PERCENT VOLATILES: | No data |
| EVAPORATION RATE: | Slower than ethyl ether |
| pH: | Not applicable |
| VISCOSITY: | <= 3300.0 cps @ -20 C; 10.0 - 11.0 cst @ 100 C |

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable. Hazardous polymerization will not occur.

**CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS**
Avoid contact with: acids, halogens, strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS**
May form: aldehydes, carbon dioxide and carbon monoxide, hydrogen sulfide, oxides of sulfur, nitrogen and phosphorus, toxic fumes, various hydrocarbons.

## 11. TOXICOLOGICAL PROPERTIES

No data

## 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

| | |
|---|---|
| PROPER SHIPPING NAME: | None |
| HAZARD CLASS and PACKING GROUP: | None |
| DOT IDENTIFICATION NUMBER: | None |
| DOT SHIPPING LABEL: | None |

## 15. REGULATORY INFORMATION

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

This product and its constituents listed herein are on the EPA TSCA Inventory. 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)**

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**SARA SECTION 311/312 - HAZARD CLASSES**

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

**SARA SECTION 313 - SUPPLIER NOTIFICATION**

ZINC C1-C14 ALKYLDITHIOPHOSPHATE (CAS No. 68649-42-3)

**CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS**

This product and its components are not listed on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Not controlled

## 16. OTHER INFORMATION

**NFPA® HAZARD RATING**

| | |
|---|---|
| HEALTH: | 1 |
| FIRE: | 1 |
| REACTIVITY: | 0 |

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

**HMIS® HAZARD RATING**

| | | |
|---|---|---|
| HEALTH: | 1 * | Slight |
| FIRE: | 1 | Slight |
| PHYSICAL: | 0 | Negligible |
| | | * Chronic |

**SUPERSEDES MSDS DATED:** 05/11/1999

**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 |

third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

MATERIAL SAFETY DATA SHEET

**Hess 10W40 Motor Oil** **MSDS No. 14292**

**EMERGENCY OVERVIEW**
**CAUTION!**
**OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT**
**EFFECTS CENTRAL NERVOUS SYSTEM**
**HARMFUL OR FATAL IF SWALLOWED**

**Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.**
**If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).**

NFPA 704 (Section 16)

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Hess Corporation**
**1 Hess Plaza**
**Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER:** **VALVOLINE: 800-247-5263**
**COMPANY CONTACT (business hours):** Valvoline Info: 606-357-7847
Corporate EHS 732-750-6000
**MSDS Internet Website:** www.hess.com

**SYNONYMS:** Valvoline Product Code 52670414

This product is manufactured by The Valvoline Company and packaged under the Amerada Hess ("Hess") label. The information in this MSDS has been developed by The Valvoline Company, MSDS No. 505.0164091-016.003I, date 5/11/99.

See Section 16 for abbreviations and acronyms.

## 2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

| INGREDIENT NAME (CAS No.) | CONCENTRATION PERCENT BY WEIGHT |
|---|---|
| Aliphatic Petroleum Distillates (64742-65-0) | 83.0 – 93.0 |
| Detergent/ Dispersant Engine Oil Package | N/A |
| Zinc Compounds | N/A |

Petroleum-based lubricating oil with detergent/dispersant engine oil package with zinc compounds.

## 3. HAZARDS IDENTIFICATION

**EYES**
May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

**SKIN**
May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms include redness, burning, drying and cracking of the skin, and skin burns. Additional symptoms of skin contact include: acne. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

**INGESTION**

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

**INHALATION**
It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits.

**CHRONIC EFFECTS and CARCINOGENICITY**
This material is not listed as a carcinogen by IARC, NTP, or OSHA. Used motor oil has been shown to cause skin cancer in laboratory animal continually exposed by repeated applications. Avoid prolonged or repeated skin contact.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

## 4. FIRST AID MEASURES

**EYES**
If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is visual difficulty, seek medical attention.

**SKIN**
Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

**INGESTION**
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

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

**Note to Physicians**
Acute aspiration of large amounts of oil-laden material may produce a serious aspiration hazard. Patients who aspirate these oils should be followed for the development of long-term sequelae. Repeated aspiration of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin.

## 5. FIRE FIGHTING MEASURES

**FLAMMABLE PROPERTIES:**

| | |
|---|---|
| FLASH POINT: | 435.0 $^{o}$F (223.8 $^{o}$C) COC |
| AUTOIGNITION POINT: | No data |
| EXPLOSIVE LIMITS (%): | No data |

**FIRE AND EXPLOSION HAZARDS**

Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. No special fire hazards are known to be associated with this product. Dense smoke may be generated while burning.

**HAZARDOUS PRODUCTS OF COMBUSTION**

May form: carbon dioxide and carbon monoxide, oxides of sulfur, nitrogen and phosphorous, various hydrocarbons.

**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'S SPILL CONTINGENCY OR EMERGENCY RESPONSE 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. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

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.

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

SMALL SPILL: Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.

LARGE SPILL: Prevent run-off to sewers, streams, or other bodies of water. If run-off occurs, notify authorities as required, that a spill has occurred. Persons not wearing proper personal protective equipment should be excluded from area of spill until clean-up has been completed.

## 7. HANDLING and STORAGE

### HANDLING PRECAUTIONS

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five gallon pails and larger metal containers including tank cars and tank trucks should be grounded and/or bonded when material is transferred. Precautions during use: avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

### 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 |
|---|---|---|---|
| Aliphatic Petroleum Distillates | OSHA | 5 mg/m, as mineral oil mist | |
| (64742-65-0) | ACGIH | 5 mg/m, as mineral oil mist | |

### 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**
Not normally required. However, wear resistant gloves such as nitrile rubber to prevent irritation which may result from prolonged or repeated skin contact with product. To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Wear normal work clothing covering arms and legs..

**RESPIRATORY PROTECTION**
A NIOSH/MSHA-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, 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**
Dry, clear, and bright liquid

**ODOR**
No data

**BASIC PHYSICAL PROPERTIES**

| | |
|---|---|
| BOILING RANGE: | (for component) > 425.0 F (218.3 C) @ 760.00 mmHg |
| VAPOR PRESSURE: | No data |
| VAPOR DENSITY (air = 1): | No data |
| LIQUID DENSITY: | 7.340 lbs/gal @ 60.00 F (.881 kg/l @ 15.60 C ) |
| SPECIFIC GRAVITY ($H_2O$ = 1): | 0.881 @ 60F |
| PERCENT VOLATILES: | No data |
| EVAPORATION RATE: | Slower than ethyl ether |
| pH: | No data |
| VISCOSITY: | <= 3300.0 cps @ -20 C; 13.5 – 14.5 cst @ 100 C |

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable. Hazardous polymerization will not occur.

**CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS**
Avoid contact with: acids, halogens, strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS**
May form: aldehydes, carbon dioxide and carbon monoxide, hydrogen sulfide, oxides of sulfur, nitrogen and phosphorus, toxic fumes, various hydrocarbons.

## 11. TOXICOLOGICAL PROPERTIES

No data

## 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

| | |
|---|---|
| PROPER SHIPPING NAME: | None |
| HAZARD CLASS and PACKING GROUP: | None |
| DOT IDENTIFICATION NUMBER: | None |
| DOT SHIPPING LABEL: | None |

## 15. REGULATORY INFORMATION

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

This product and its constituents listed herein are on the EPA TSCA Inventory. 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)**

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**SARA SECTION 311/312 - HAZARD CLASSES**

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

**SARA SECTION 313 - SUPPLIER NOTIFICATION**

ZINC C1-C14 ALKYLDITHIOPHOSPHATE (CAS No. 68649-42-3)

**CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS**

This product and its components are not listed on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Not controlled

## 16. OTHER INFORMATION

| | | |
|---|---|---|
| **NFPA® HAZARD RATING** | HEALTH: | 1 |
| | FIRE: | 1 |
| | REACTIVITY: | 0 |

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

| **HMIS® HAZARD RATING** | | | |
|---|---|---|---|
| | HEALTH: | 1 * | Slight |
| | FIRE: | 1 | Slight |
| | PHYSICAL: | 0 | Negligible |
| | | | * Chronic |

**SUPERSEDES MSDS DATED:** 05/11/1999

**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 |

MATERIAL SAFETY DATA SHEET

**Hess Dextron/Mercon ATF** **MSDS No. 16931**

**EMERGENCY OVERVIEW**
**CAUTION!**
**OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT**
**EFFECTS CENTRAL NERVOUS SYSTEM**
**HARMFUL OR FATAL IF SWALLOWED**

**Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.**
**If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).**

NFPA 704 (Section 16)

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Hess Corporation**
**1 Hess Plaza**
**Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER:** **VALVOLINE: 800-247-5263**
**COMPANY CONTACT (business hours):** Valvoline Info: 606-357-7847
Corporate EHS 732-750-6000
**MSDS Internet Website:** www.hess.com

**SYNONYMS:** Automatic Transmission Fluid; Valvoline Product Code 52678302

This product is manufactured by The Valvoline Company and packaged under the Amerada Hess ("Hess") label. The information in this MSDS has been developed by The Valvoline Company, MSDS No. 505.0200299-007.002I, date 09/14/99.

See Section 16 for abbreviations and acronyms.

## 2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

| INGREDIENT NAME (CAS No.) | CONCENTRATION PERCENT BY WEIGHT |
|---|---|
| Aliphatic Petroleum Distillates (64742-65-0) | 73.0 - 83.0 |

Petroleum-based lubricating oil with transmission fluid package.

## 3. HAZARDS IDENTIFICATION

**EYES**
Unlikely to cause eye irritation or injury

**SKIN**
Short-term exposure is not expected to cause skin irritation or injury. Prolonged or repeated exposure may dry and crack the skin. Pre-existing skin disorders may be aggravated by exposure to this material. Additional symptoms of skin contact may include: acne, Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

**INGESTION**
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

**INHALATION**

It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful.

**SYMPTOMS OF EXPOSURE**
Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, and diarrhea) irritation (nose, throat, airways).

**CHRONIC EFFECTS and CARCINOGENICITY**
This material is not listed as a carcinogen by IARC, NTP, or OSHA.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

## 4. FIRST AID MEASURES

**EYES**
If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is visual difficulty, seek medical attention.

**SKIN**
First aid is not normally required. However, it is recommended that exposed areas be cleaned by washing with soap and water.

**INGESTION**
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

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

**Note to Physicians**
Acute aspiration of large amounts of oil-laden material may produce a serious aspiration hazard. Patients who aspirate these oils should be followed for the development of long-term sequelae. Repeated aspiration of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin.

## 5. FIRE FIGHTING MEASURES

**FLAMMABLE PROPERTIES:**

| | |
|---|---|
| FLASH POINT: | 365.0 $^{o}$F (185 $^{o}$C) COC |
| AUTOIGNITION POINT: | No data |
| EXPLOSIVE LIMITS (%): | No data |

**FIRE AND EXPLOSION HAZARDS**

Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. No special fire hazards are known to be associated with this product. Dense smoke may be generated while burning.

**HAZARDOUS PRODUCTS OF COMBUSTION**

May form: carbon dioxide and carbon monoxide, oxides of sulfur, nitrogen and phosphorous, various hydrocarbons.

**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'S SPILL CONTINGENCY OR EMERGENCY RESPONSE 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. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

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.

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

SMALL SPILL: Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.

LARGE SPILL: Prevent run-off to sewers, streams, or other bodies of water. If run-off occurs, notify authorities as required, that a spill has occurred. Persons not wearing proper personal protective equipment should be excluded from area of spill until clean-up has been completed.

## 7. HANDLING and STORAGE

### HANDLING PRECAUTIONS

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five gallon pails and larger metal containers including tank cars and tank trucks should be grounded and/or bonded when material is transferred. Precautions during use: avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

### 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 |
|---|---|---|---|
| Aliphatic Petroleum Distillates | OSHA | 5 mg/m, as mineral oil mist | |
| (64742-65-0) | ACGIH | 5 mg/m, as mineral oil mist | |

**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**
Not required under normal conditions of use. However, if misting or splashing conditions exist, then safety glasses or chemical splash goggles are advised.

**SKIN PROTECTION**
Not normally required. However, wear resistant gloves such as nitrile rubber to prevent irritation which may result from prolonged or repeated skin contact with product. To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Wear normal work clothing covering arms and legs..

**RESPIRATORY PROTECTION**
A NIOSH/MSHA-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, 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**
Red liquid

**ODOR:** Petroleum

**BASIC PHYSICAL PROPERTIES**

| | |
|---|---|
| BOILING RANGE: | No data |
| VAPOR PRESSURE: | No data |
| VAPOR DENSITY (air = 1): | No data |
| LIQUID DENSITY: | 7.29 lbs/gal @ 60.00 F (.875 kg/l @ 15.60 C ) |
| SPECIFIC GRAVITY ($H_2O$ = 1): | 0.875 @ 60F |
| PERCENT VOLATILES: | No data |
| EVAPORATION RATE: | Slower than ethyl ether |
| pH: | No data |
| VISCOSITY: | 6.9 - 8.0 cst @ 100 C; 29.0 - 42.6 cst @ 40 C > 175.0 ratio |

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable. Hazardous polymerization will not occur.

**CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS**
Avoid contact with: acids, halogens, strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS**
May form: aldehydes, carbon dioxide and carbon monoxide, hydrogen sulfide, oxides of sulfur, nitrogen and phosphorus, toxic fumes, various hydrocarbons.

## 11. TOXICOLOGICAL PROPERTIES

No data

## 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

| | |
|---|---|
| PROPER SHIPPING NAME: | None |
| HAZARD CLASS and PACKING GROUP: | None |
| DOT IDENTIFICATION NUMBER: | None |
| DOT SHIPPING LABEL: | None |

## 15. REGULATORY INFORMATION

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

This product and its constituents listed herein are on the EPA TSCA Inventory. 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)**

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**SARA SECTION 311/312 - HAZARD CLASSES**

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

**SARA SECTION 313 - SUPPLIER NOTIFICATION**

ZINC C1-C14 ALKYLDITHIOPHOSPHATE (CAS No. 68649-42-3)

**CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS**

This product and its components are not listed on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Not controlled

## 16. OTHER INFORMATION

| | | |
|---|---|---|
| **NFPA® HAZARD RATING** | HEALTH: | 1 |
| | FIRE: | 1 |
| | REACTIVITY: | 0 |

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

| **HMIS® HAZARD RATING** | | | |
|---|---|---|---|
| | HEALTH: | 1 * | Slight |
| | FIRE: | 1 | Slight |
| | PHYSICAL: | 0 | Negligible |
| | | | * Chronic |

**OTHER:** The information presented in this MSDS was taken directly from the MSDS for this product prepared by The Valvoline Company, the manufacturer of the product – see Section 2.

**SUPERSEDES MSDS DATED:** 05/11/1999

**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 |

# Material Safety Data Sheet

**308166**
**Rev. D**
**Updated: 5/02**

INSTRUCTIONS
This Data Sheet contains important information.
READ AND KEEP FOR REFERENCE.

*First choice when quality counts.*

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

## Emergency Overview

**Physical State** Liquid.
**Color** Clear to light amber. **Odor** Mild petroleum odor

**WARNING!**
**Oil injected into the skin from high-pressure leaks in hydraulic systems can cause severe injury.**
**Most damage occurs during the first few hours.**
**Seek medical attention immediately.**
**Surgical removal of oil may be necessary.**
**Spills may create a slipping hazard.**

## Hazard Rankings

| | HMIS | NFPA |
|---|---|---|
| Health Hazard | 1 | 0 |
| Fire Hazard | 1 | 1 |
| Reactivity | 0 | 0 |

* = Chronic Health Hazard

## Protective Equipment

Minimum Requirements
See Section 8 for Details

## 1.0 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name: Hydraulic Fluid**
**Chemical Name: Industrial Oils**

Graco Inc.
P.O. Box 1441
60 11th Ave. NE
Minneapolis, MN 55440–1441

**Part Number(s): 218-797**

**Use: Hydraulic Fluid used in PT2500 electric driver hydraulic pump.**

**Emergency Information**
Health Emergency (RMPC): (303)– 623–5716

Chemical Spills (Chemtrec): (800)– 424–9300

## 2.0 COMPOSITION / INFORMATION ON INGREDIENTS

| Component % | CAS# | % by Weight |
|---|---|---|
| 1)Distillates, petroleum, solvent-refined light paraffinic | 64741-89-5 | 30 – 50 |
| 2)Distillates, petroleum, solvent-refined heavy paraffinic | 64741-89-5 | 40 – 60 |
| 3) Proprietary Ingredients | Proprietary Mixture | 0 – 2 |
| 4) Zinc alkyldithiophosphate | 68649-42-3 | 0 - 1 |

For exposure data, see **8.0, Exposure Controls / Personal Protection.**

## 3.0 HAZARDS IDENTIFICATION

**Emergency Overview:** **Physical State:** Liquid **Odor:** Mild petroleum odor **Color:** Clear to light amber

### Potential Health Effects:

| | |
|---|---|
| **Eye Contact** | This product can cause transient mild eye irritation with short-term contact with liquid sprays or mists |
| **Skin Contact** | This material can cause mild skin irritation from prolonged or repeated skin contact. Injection under the skin can cause inflammation, swelling and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention. |
| **Inhalation** | At elevated temperatures or in enclosed spaces, product mist or vapors may irritate the mucous membranes of the nose, the throat, bronchi, and lungs |
| **Ingestion** | If swallowed, large volumes of material can cause generalized depression, headache, drowsiness, nausea, vomiting and diarrhea. Smaller doses can cause a laxative effect. If aspirated into the lungs, liquid can cause lung damage. |
| **Chronic Health Effects Summary** | Contains a petroleum-based mineral oil. Prolonged or repeated skin contact can cause mild irritation and inflammation characterized by drying, cracking, (dermatitis) or oil acne. Repeated or prolonged inhalation of petroleum-based mineral oil mists at concentrations above applicable workplace exposure levels can cause respiratory irritation or other pulmonary effects. |
| **Conditions Aggravated by Exposure** | Medical conditions aggravated by exposure to this material may include pre-existing skin disorders. |
| **Target Organs** | This material may cause damage to the following organs: skin. |
| **Carcinogenic Potential** | This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP. |

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** | ☐ | **Toxic** | ☐ | **Combustible** | ☐ | **Explosive** | ☐ | **Pyrophoric** | ☐ | | |
| **Sensitizer** | ☐ | **Highly Toxic** | ☐ | **Flammable** | ☐ | **Oxidizer** | ☐ | **Water-reactive** | ☐ | | |
| **Corrosive** | ☐ | **Carcinogenic** | ☐ | **Compressed Gas** | ☐ | **Organic Peroxide** | ☐ | **Unstable** | ☐ | | |

## 4.0 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.**

| | |
|---|---|
| **Eye** | Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists. |
| **Skin** | Remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately. |
| **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. |
| **Ingestion** | Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately |
| **Notes to Physician** | In the event of injection in underlying tissue, immediate treatment should include extensive incision, debridement and saline irrigation. Inadequate treatment can result in ischemia and gangrene. Early symptoms may be minimal. |

. **NOTES:** NA = Not Applicable; NE = Not Established; UN = Unavailable

## 5.0 FIREFIGHTING MEASURES

| | |
|---|---|
| **Flashpoint** | OPEN CUP: 212°C (414°F) (Cleveland.). |
| **UFL** | No Data |
| **LFL** | No Data |
| **Autoignition Temperature** | Not Available |
| **Flammability Classification** | NFPA Class-IIIB combustible material. Slightly combustible! |
| **Extinguishing Media** | Use dry chemical, foam, Carbon Dioxide or water fog |
| **Special Properties** | This material can burn but will not readily ignite. This material will release vapors when heated above the flash point temperature that can ignite when exposed to a source of ignition. In enclosed spaces, heated vapor can ignite with explosive force. Mists or sprays may burn at temperatures below the flash point. |
| **Firefighting Equipment** | 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. |
| **Hazardous Combustion Products** | Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur, phosphorus, zinc and/or nitrogen. |

## 6.0 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.**

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

## 7.0 HANDLING AND STORAGE

| | |
|---|---|
| **Handling** | Avoid water contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product |
| **Storage** | Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120° F or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product. |

## 8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|---|---|
| **Eye** | Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available |
| **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.<br>  |
| **Hand Protection** | Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use heat-protective gloves when handling product at elevated temperatures. |
| **Body Protection** | Use clean and impervious protective clothing (e.g., neoprene or Tyvek ®) if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures |
| **Engineering Controls** | Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station |
| **Respiratory Protection** | Vaporization is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. 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** | Use good personal hygiene practices. Wash hands and other exposed skin areas 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. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines. |
| **Occupational Exposure Guidelines** | **Substance**<br>1) Oil Mist, Mineral<br><br>**Applicable Workplace Exposure Levels**<br>**ACGIH (United States).**<br>TWA: 5 mg/m $^3$<br>STEL: 10 mg/m $^3$<br>**OSHA (United States).**<br>TWA: 5 mg/m $^3$ |

## 9.0 CHEMICAL AND PHYSICAL PROPERTIES

| | |
|---|---|
| **Appearance and Odor** | Mild petroleum odor |
| **pH** | Not Applicable |
| **Vapor Pressure (mm Hg)** | <0.001 kPa (<0.01 mmHg) (at 20°C) |
| **Vapor Density (Air = 1)** | >1 (Air = 1) |
| **Boiling Point** | Not available |
| **Melting Point** | Not available |
| **Solubility in Water** | Insoluble in cold water. |
| **Specific Gravity (Water = 1)** | 0.87 (Water = 1) |
| **Physical State** | Liquid |
| **Color** | Clear to light amber |
| **Viscosity (cST @ 40°C)** | 33 |
| **Volatile Characteristics** | Negligible volatility |
| **Additional Properties** | Gravity, °API (ASTM D287) = 31.3 @ 60° F<br>Density = 7.42 Lbs/gal.<br>Viscosity (ASTM D2161) = 170 SUS @ 100° F |

## 10.0 STABILITY AND REACTIVITY

| | |
|---|---|
| **Stability** | Stable. |
| **Conditions to Avoid** | Keep away from extreme heat, sparks, open flame, and strongly oxidizing conditions. |
| **Materials to Avoid** | Strong oxidizers. |
| **Hazardous Decomposition** | No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS |
| **Hazardous Polymerization** | Not expected to occur |

## 11.0 TOXILOGICAL INFORMATION

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

**Distillates, petroleum, solvent-refined light paraffini**c:
ORAL (LD50): Acute: >5000 mg/kg [Rat].
DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].
**Distillates, petroleum, solvent-refined heavy paraffini**c:
ORAL (LD50): Acute: >5000 mg/kg [Rat].
DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

**Distillates, petroleum, solvent-refined light paraffini**c:
Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

**Distillates, petroleum, solvent-refined heavy paraffini**c:
Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

**Hydraulic Oils:**
Repeated or prolonged skin contact with certain hydraulic oils can cause mild skin irritation characterized by drying, cracking (dermatitis) or oil acne. Injection under the skin, in muscle or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects, including mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage.

## 12.0 ECOLOGICAL INFORMATION

**Ecotoxicity**
Analysis for ecological effects has not been conducted on this product. However, if spilled, this product and any contaminated soil or water may be harmful to human, animal, and aquatic life. Also, the coating action associated with petroleum and petroleum products can be harmful or fatal to aquatic life and waterfowl.

**Environmental Fate**
An environmental fate analysis has not been conducted on this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway can result in a loss of marine life or create an anaerobic environment. This material contains phosphorus which is a controlled element for disposal in effluent waters in most sections of North America. Phosphorus is known to enhance the formation of algae. Severe algae growth can reduce oxygen content in the water possibly below levels necessary to support marine life.

## 13.0 DISPOSAL INFORMATION

**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.**

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 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specific disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

## 14.0 TRANSPORTATION INFORMATION

**U.S. Dept. of Transportation:** Not a US Department of Transportation regulated material.

**Hazard Class -** Not regulated
**Packing Group(s**) – Not applicable
**UN/NA ID –** Not regulated
**Reportable Quantity** – A Reportable Quantity (RQ) has not been established for this material.
**Placards**

**Emergency Response Guide No.** Not applicable
**Hazmat STCC No**. – Not assigned
**MARPOL III Status** – Not a DOT "Marine Pollutant' Per 49 CFR 171.8

## 15.0 REGULATORY INFORMATION

| | |
|---|---|
| **CERCLA Sections 102A/103 Hazardous Substances (40 CFR Part 302.4)** | 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: Zinc and Zinc Compounds, Concentration: 0 - 1% |
| **SARA Title III Section 302 Extremely Hazardous Substances (40 CFR Part 355)** | 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 Title III Section 311/312 Hazardous Categorization (40 CFR Part 370)** | 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: No SARA 311/312 hazard categories identified. |
| **SARA Title III Sections 313 (40 CFR Part 372)** | 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: No components were identified. |
| **U.S. Inventory (TSCA)** | This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory. |
| **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): Toluene: 0.001% |
| **New Jersey Right-to-Know Label** | Petroleum Oil (Hydraulic Fluid) |
| **Additional Regulatory Remarks** | No additional regulatory remarks |

## 16.0 OTHER INFORMATION

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

**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
IARC = International Agency for Research on Cancer
NIOSH = National Institute of Occupational Safety and Health
NPCA = National Paint and Coating Manufacturers Association
NFPA = National Fire Protection Association
AIHA = American Industrial Hygiene Association
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
HMIS = Hazardous Materials Information System
EPA = Environmental Protection Agency

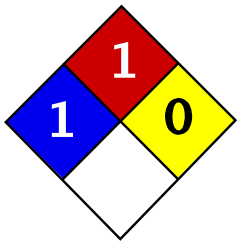
| **Prepared By** | Graco, Inc. |
|---|---|

This Material Safety Data Sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we have received from sources outside our company. We believe that information to be correct, but cannot guarantee its accuracy or completeness. Health and safety precautions in this Data Sheet may not be adequate for all individuals and/or situations. It is the users' obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

**NOTES:** NA = Not Applicable; NE = Not Established; UN = Unavailable

*All written and visual data contained in this document reflects the latest product information available at the time of publication.*
*Graco reserves the right to make changes at any time without notice.*
**Sales Offices:** Minneapolis, Detroit,
**International Offices:** Belgium, Korea, Hong Kong, Japan

**www.graco.com**
PRINTED IN U.S.A.


| | |
|---|---|
| Health | 1 |
| Fire | 1 |
| Reactivity | 0 |
| Personal Protection | C |

# Material Safety Data Sheet
## Ethylene glycol MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Ethylene glycol

**Catalog Codes:** SLE1072

**CAS#:** 107-21-1

**RTECS:** KW2975000

**TSCA:** TSCA 8(b) inventory: Ethylene glycol

**CI#:** Not available.

**Synonym:** 1,2-Dihydroxyethane; 1,2-Ethanediol; 1,2-Ethandiol; Ethylene dihydrate; Glycol alcohol; Monoethylene glycol; Tescol

**Chemical Name:** Ethylene Glycol

**Chemical Formula:** HOCH2CH2OH

**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 |
|---|---|---|
| Ethylene glycol | 107-21-1 | 100 |

**Toxicological Data on Ingredients:** Ethylene glycol: ORAL (LD50): Acute: 4700 mg/kg [Rat]. 5500 mg/kg [Mouse]. 6610 mg/kg [Guinea pig]. VAPOR (LC50): Acute: >200 mg/m 4 hours [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of inhalation. Severe over-exposure can result in death.

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Non-mutagenic for bacteria and/or yeast.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to kidneys, liver, central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human

organs.

## 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. Cold water may be used. 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. Cold water may be used.

**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 immediately.

**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:**
Medical Conditions Aggravated by Exposure:
Persons with pre-existiing kidney, respiratory, eye, or neurological problems might be more sensitive to Ethylene Glycol.
Notes to Physician:
1. Support vital functions, correct for dehydration and shock, and manage fluid balance.
2. The currently recommended medical management of Ethylene Glycol poisoning includes elimination of Ethylene Glycol and metabolites. Elimination of Ethylene Glycol may be achieved by the following methods:
a. Emptying the stomach by gastric lavage. It is useful if initiated within < 1 of ingestion.
b. Correct metabolic acidosis with intravenous administration of sodium bicarbonate, adjusting the administration rate accoridng to repeated and frequent measurement of acid/base status.
c. Administer ethanol (orally or by IV (intravenously)) or fomepizole (4-methylpyrazole or Antizol)) therapy by IV as an antidote to inhibit the ormation of toxic metabolites.
d. If patients are diagnosed and treated early in the course with the above methods, hemodialysis may be avoided if fomepizole or ethanol therapy is effective and has corrected the metabolic acidosis, and no renal failure is present. However, once severe acidosis and renal failure occured, however, hemodialysis is necessary. It is effective in removing Ethylene Glycol and toxic metabolites, and correcting metabolic acidosis.

## Section 5: Fire and Explosion Data

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

**Auto-Ignition Temperature:** 398°C (748.4°F)

**Flash Points:** CLOSED CUP: 111°C (231.8°F). (Tagliabue.)

**Flammable Limits:** LOWER: 3.2%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**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:** Not available.

**Special Remarks on Explosion Hazards:**
Explosive decomposition may occur if combined with strong acids or strong bases and subjected to elevated temperatures.

## Section 6: Accidental Release Measures

**Small Spill:**
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**
Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. 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. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. 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, acids, alkalis.

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

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Safety glasses. Synthetic apron. Gloves (impervious). For most conditions, no respiratory protection should be needed. However, if material is heated or sprayed and if atmospheric levels exceed exposure guidelines, use an approved vapor (air purifying) respirator.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
STEL: 120 (mg/m3) [Australia]
TWA: 100 (mg/m3) from ACGIH (TLV) [United States]
CEIL: 125 (mg/m3) from OSHA (PEL) [United States]
CEIL: 50 (ppm) from OSHA (PEL) [United States]

TWA: 52 STEL: 104 (mg/m3) [United Kingdom (UK)] Inhalation
TWA: 10 (mg/m3) [United Kingdom (UK)] SKIN3
Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (syrupy)

**Odor:** Odorless.

**Taste:** Mild sweet

**Molecular Weight:** 62.07 g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 197.6°C (387.7°F)

**Melting Point:** -13°C (8.6°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.1088 (Water = 1)

**Vapor Pressure:** .06 mmHg @ 20 C; .092 mmHg at 25 C

**Vapor Density:** 2.14 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** The product is more soluble in water; log(oil/water) = -1.4

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, acetone.

**Solubility:**
Soluble in cold water, hot water, acetone.
Slightly soluble in diethyl ether.
Miscible with lower aliphatic alcohols, glycerol, acetic acid, acetone and similar ketones, aldehydes, pyridine, similar coal tar bases.
Practically insoluble in benzene and its homologs, chlorinated hydrocarbons, petroleum ether.

## 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:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Hygroscopic. Absorbs moisture from the air.
Avoid contamination with materials with hydroxyl compounds.
Also incompatible with aliphatic amines, isocyanates, chlorosulfonic acid, and oleum

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

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

**Toxicity to Animals:**
Acute oral toxicity (LD50): 4700 mg/kg [Rat].
Acute toxicity of the vapor (LC50): >200 mg/m3 4 hours [Rat].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Non-mutagenic for bacteria and/or yeast.
May cause damage to the following organs: kidneys, liver, central nervous system (CNS).

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

**Special Remarks on Toxicity to Animals:**
Lowest Published Toxic Dose/Conc:
TDL [Man] - Route: oral; Dose: 15gm/kg
Lethal Dose/Conc 50% Kill
LD50 [Rabbit] - Route: dermal; Dose: 9530 ul/kg

**Special Remarks on Chronic Effects on Humans:**
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data. No human data has been reported at this time.
May affect genetic material (mutagenic)

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects:
Skin: May cause skin irritation. May cause more severe response if skin is abraded. A single prolonged exposure is not likely to result in material being absorbed through skin in harmful amounts. Massive contact with damaged skin may result in absorption of potentially harmful amounts
Eyes: Vapors or mist may cause temporary eye irritation (mild temporary conjunctival inflammation) and lacrimation. Corneal injury is unlikely or insignificant..
Ingestion: It is rapidly absorbed from the gastrointestinal tract. Oral toxicity is expected to be moderate in humans due to Ethylene Glycol even though tests with animals show a lower degree of toxicity. Excessive exposure (swallowing large amounts) may cause gastrointestinal tract irritation with nausea, vomiting, abdominal discomfort, diarrhea.
It can affect behavior/central nervous system within 0.5 to 12 hours after ingestion. A transient inebriation with excitement, stupor, headache, slurred speech, ataxia, somnolence, and euphoria, similar to ethanol intoxication, can occur within the first several hours. As sthe Ethylene Glycol is metabolized, metabolic acidosis and further central nervous system depression (convulsions, muscle weakness) develop. Serious intoxication may develop to coma associated with hypotonia, hyporeflexia, and less commonly seizures, and meningismus. 12 to 24 hours

## Section 12: Ecological Information

**Ecotoxicity:**
Ecotoxicity in water (LC50): 41000 mg/l 96 hours [Fish (Trout)]. 46300 mg/l 48 hours [water flea]. 34250 mg/l 96 hours [Fish (bluegill fish)]. 34250 mg/l 72 hours [Fish (Goldfish)].

**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:**
Illinois toxic substances disclosure to employee act: Ethylene glycol
Illinois chemical safety act: Ethylene glycol
New York release reporting list: Ethylene glycol
Rhode Island RTK hazardous substances: Ethylene glycol
Pennsylvania RTK: Ethylene glycol
Minnesota: Ethylene glycol
Massachusetts RTK: Ethylene glycol
Massachusetts spill list: Ethylene glycol
New Jersey: Ethylene glycol
Louisiana spill reporting: Ethylene glycol
TSCA 8(b) inventory: Ethylene glycol
TSCA 4(a) proposed test rules: Ethylene glycol
SARA 313 toxic chemical notification and release reporting: Ethylene glycol
CERCLA: Hazardous substances.: Ethylene glycol: 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):** CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**
R22- Harmful if swallowed.
S46- If swallowed, seek medical advice immediately and show this container or label.

**HMIS (U.S.A.):**

**Health Hazard:** 1

**Fire Hazard:** 1

**Reactivity:** 0

**Personal Protection:** C

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

**Health:** 1

**Flammability:** 1

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves.
Lab coat.
Not applicable.
Safety glasses.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:18 PM

**Last Updated:** 11/06/2008 12:00 PM

# MATERIAL SAFETY DATA SHEET
# LUBRIMATIC ULTRA LUBE GREASE (11309 - 11310)

## 1. PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| **TRADE NAME** | LUBRIMATIC ULTRA LUBE GREASE (11309 - 11310) |
| **PRODUCT NUMBER** | 11309, 11310, MBK99000A0 |
| **PRODUCT USE** | Lubricating Grease |
| **MANUFACTURER** | Chemtool, Incorporated<br>801 West Rockton Rd.<br>Rockton, IL 61072 U.S.A |
| **DISTRIBUTOR** | Plews/Edelmann<br>1550 Franklin Grove Road<br>Dixon, IL 61021 U.S.A.<br>Tel: +01(815) 288 - 3344 |
| **EMERGENCY TELEPHONE** | CHEMTREC +1 800 424 9300 - Outside the US +01 703 527 3887 [for Plews/Edelmann] |
| **Date of last issue** | 2010-01-27 |

## 2. COMPOSITION AND INFORMATION ON INGREDIENTS

| INGREDIENT NAME | CAS No. | WEIGHT |
|---|---|---|
| LUBRICATING OILS, PETROLEUM, BASE OILS, HIGHLY REFINED (IP346 DMSO Extracts <3%) | Mixture**(2) | 70-90 % |
| *LITHIUM SOAP AND MIXED BASE THICKENERS | Proprietary | 5-15 % |
| *PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS | 68649-42-3 | <1 % |
| *BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT | 26264-06-2 | <0.5 % |
| *CARBON BLACK | 1333-86-4 | <0.2 % |
| *ANTIMONY DIALKYLDITHIOCARBAMATE | Proprietary | <0.1 % |

* This chemical(s) is hazardous according to OSHA/WHIMIS criteria

**COMPOSITION COMMENTS**

Refer to section eight (8) for exposure limits on ingredients. Chemical ingredients not regulated by OSHA or SARA are treated confidentially.
**(2) The base oil for this product can be a mixture of any of the following highly refined petroleum streams:
CAS 64741-88-4; CAS 64741-89-5; CAS 64741-95-3; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-83-7; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1. Carcinogenicity: The petroleum base oils contained in this product

have been highly refined by a variety of processes including solvent extraction, solvent dewaxing and hydrotreating to remove aromatics and improve performance characteristics. All petroleum base oils contained in this product meet the IP 346 criteria of less than 3 percent DMSO extractable PAH's and are not considered carcinogens by IARC, NTP or OSHA.

## 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**

| | |
|---|---|
| **HEALTH HAZARDS, GENERAL** | Exposure to vapors generated at high temperatures may cause respiratory irritation. |
| **SENSITIZATION** | No known information. |
| **CARCINOGENICITY** | IARC-2B: The agent is possibly carcinogenic to humans (limited evidence of carcinogenicity in humans). Carbon Black, CAS # 1333-86-4 |
| **HEALTH WARNINGS** | INHALATION. Heating can generate vapors that may cause respiratory irritation, nausea and headaches. Inhalation hazard at room temperature is unlikely due to the low volatility of this product. SKIN CONTACT. Repeated or prolonged contact can result in drying of the skin. EYE CONTACT. Irritating. INGESTION. Can cause stomach ache and vomiting. Main hazard, if ingested, is aspiration into the lungs and subsequent pneumonitis. |
| **ROUTE OF ENTRY** | Inhalation. Skin and/or eye contact. Ingestion. |
| **MEDICAL SYMPTOMS** | MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: |

## 4. FIRST AID MEASURES

| | |
|---|---|
| **INHALATION** | Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor of hot product, immediately remove from source of exposure. Move the exposed person to fresh air at once. For breathing difficulties oxygen may be necessary. Get medical attention if any discomfort continues. |
| **EYES** | Rinse the eye with water immediately. Continue to rinse for at least 15 minutes. Contact physician if discomfort continues. |
| **SKIN** | Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues. |
| **INGESTION** | DO NOT INDUCE VOMITING! Get medical attention immediately! |

## 5. FIRE FIGHTING MEASURES

| | |
|---|---|
| **FLASH POINT (°C)** | 224 (435°F) Cd OC (Cleveland open cup). |
| **FLAMMABILITY LIMIT - LOWER(%)** | N/D |
| **FLAMMABILITY LIMIT - UPPER(%)** | N/D |
| **EXTINGUISHING MEDIA** | Use: Carbon dioxide (CO2). Dry chemicals, sand, dolomite etc. Alcohol resistant foam. Water spray, fog or mist. |
| **SPECIAL FIRE FIGHTING PROCEDURES** | Use water to keep fire exposed containers cool and disperse vapors. Water spray may be used to flush spills away from exposures and dilute spills to non-flammable |

| | |
|---|---|
| | mixtures. Avoid water in straight hose stream; will scatter and spread fire. Keep run-off water out of sewers and water sources. Dike for water control. |
| **UNUSUAL FIRE & EXPLOSION HAZARDS** | Pressure will increase in over heated, closed containers. |
| **HAZARDOUS COMBUSTION PRODUCTS** | Oxides of: Carbon. |
| **PROTECTIVE MEASURES IN CASE OF FIRE** | Self-contained breathing equipment and chemical resistant clothing recommended. |

## 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **PERSONAL PRECAUTIONS** | Minimize skin contact. Avoid breathing vapors. Wear an appropriate respirator if exposure exceeds recommended guidelines. Remove sources of ignition. Wear suitable eye protection. |
| **PRECAUTIONS TO PROTECT THE ENVIRONMENT** | Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with applicable government regulations. |
| **SPILL CLEAN-UP PROCEDURES** | Contain spill. Absorb small amounts. Collect and return large amounts to shipping container. Rinse area with water. |

## 7. HANDLING AND STORAGE

| | |
|---|---|
| **HANDLING PRECAUTIONS** | Ventilate well, avoid breathing vapors. Use approved respirator if air contamination is above accepted level. Do not reuse container. Keep lid closed when not in use. Do not store or mix with strong oxidizers. Avoid spilling, skin and eye contact. Eye wash and emergency shower must be available at the work place. |
| **STORAGE PRECAUTIONS** | Store separate from strong acids and oxidizers. Keep away from heat, sparks and open flame. |
| **STORAGE CRITERIA** | Chemical storage. |

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

| COMPONENT | STD | TWA | STEL | TWA | STEL |
|---|---|---|---|---|---|
| LUBRICATING OILS, PETROLEUM, BASE OILS, HIGHLY REFINED (IP346 DMSO Extracts <3%) | OSHA | | | 5 mg/m3 as oil mist | |
| | ACGIH | | | 5 mg/m3 as oil mist | 10 mg/m3 as oil mist |
| CARBON BLACK | OSHA | | | 3.5 mg/m3 | |
| | ACGIH | | | 3.5 mg/m3 | **A4 |
| | NIOSH | 3.5 mg/m3 | **Ca | | |
| ANTIMONY DIALKYLDITHIOCARBAMATE | OSHA | | | 0.5 mg/m3 as Sb | |
| | ACGIH | | | 0.5 mg/m3 as Sb | |

**INGREDIENT COMMENTS**

**NIOSH Ca: Potential Occupational Carcinogen.
**ACGIH A4: Not Classifiable as a Human Carcinogen.

**PROTECTIVE EQUIPMENT**

| | |
|---|---|
| **ENGINEERING CONTROLS** | Use engineering controls to reduce air contamination to permissible exposure level. |
| **VENTILATION** | No specific ventilation requirements noted, but forced ventilation may still be required if air contamination exceeds acceptable level. |
| **RESPIRATORS** | No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. |
| **PROTECTIVE GLOVES** | Chemical resistant gloves recommended to prevent prolonged or repeated contact. |
| **EYE PROTECTION** | Wear splash-proof eye goggles to prevent any possibility of eye contact. |
| **PROTECTIVE CLOTHING** | Wear appropriate clothing to prevent repeated or prolonged skin contact. |
| **HYGIENIC WORK PRACTICES** | Wash at the end of each work shift and before eating, smoking and using the toilet. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---|---|---|---|
| **APPEARANCE/PHYSICAL STATE** | Grease. | | |
| **COLOR** | Black. | | |
| **ODOR** | Mild (or faint). Petroleum. | | |
| **SOLUBILITY DESCRIPTION** | Insoluble in water. | | |
| **DENSITY** | 0.89 | **Temperature (°C)** | 15.6 (60°F) |
| **VAPOR DENSITY (air=1)** | > 5 | | |
| **VAPOR PRESSURE** | < 0.1 mmHg | **Temperature (°C)** | 20 (68°F) |
| **EVAPORATION RATE** | < 0.01 | **Reference** | BuAc=1 |
| **pH-VALUE, CONC. SOLUTION** | N/A | | |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **STABILITY** | Normally stable. |
| **CONDITIONS TO AVOID** | Avoid contact with acids and oxidizing substances. |
| **HAZARDOUS POLYMERIZATION** | Will not occur. |
| **POLYMERIZATION DESCRIPTION** | Not applicable |
| **MATERIALS TO AVOID** | Acids, oxidizing. Strong oxidizing agents. |

| | |
|---|---|
| **HAZARDOUS DECOMPOSITION PRODUCTS** | Oxides of: Carbon. |

## 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **TOXICOLOGICAL INFORMATION** | No experimental toxicological data on the preparation as such is available. |
| **COMPONENT** | **LUBRICATING OILS, PETROLEUM, BASE OILS, HIGHLY REFINED (IP346 DMSO Extracts <3%)** |
| **TOXICOLOGICAL DATA** | WHMIS (Canada) = Not a controlled product.<br>Carcinogenicity. IP 346 = <3% DMSO Extracts. |
| **TOXIC DOSE - LD 50** | > 5000 mg/kg (oral rat) |
| **TOXIC DOSE - LD 50 SKIN** | > 2000 mg/kg (skn rbt) |
| **TOXIC CONC. - LC 50** | No Information Available (NIA). |
| **IRRITATION** | Prolonged skin contact may cause irritation. |
| **SENSITIZATION** | Not known to be a sensitizer. |
| **COMPONENT** | **LITHIUM SOAP AND MIXED BASE THICKENERS** |
| **TOXIC DOSE - LD 50** | No Information Available (NIA). |
| **TOXIC CONC. - LC 50** | No Information Available (NIA). |
| **COMPONENT** | **CARBON BLACK** |
| **TOXICOLOGICAL DATA** | WHMIS (Canada) D2A<br>Acute toxicity. TCLo 6 hours. Inhalation. Rat. 7 mg/m3<br>Irritating effects. Skin. Slight Irritant (0.6/8)<br>Carcinogenicity. IARC = 2B |
| **TOXIC DOSE - LD 50** | > 15400 mg/kg (oral rat) |
| **TOXIC DOSE - LD 50 SKIN** | > 3000 mg/kg (skn rbt) |
| **CARCINOGENICITY** | NTP: Not listed. MAK-3 designation: Substances which cause concern that they could be carcinogenic for man. IARC-2B: The agent is possibly carcinogenic to humans (limited evidence of carcinogenicity in humans). |

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **ECOLOGICAL INFORMATION** | There is no ecological data on the product itself. |

## 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **DISPOSAL METHODS** | Spilled material, unused contents and empty containers must be disposed of in accordance with local, state and federal regulations. |

## 14. TRANSPORT INFORMATION

| | |
|---|---|
| **DOT HAZARD CLASS** | Not regulated. |
| **REPORTABLE QUANTITY (RQ)** | No |
| **TDGR CLASS** | Not Regulated. |
| **IMDG CLASS** | Not regulated |
| **SEA TRANSPORT NOTES** | Not regulated per IMDG. |
| **AIR TRANSPORT NOTES** | Not regulated per IATA. |

## 15. REGULATORY INFORMATION

**US FEDERAL REGULATIONS**

| COMPONENT | SARA 302 | CERCLA | SARA 313 |
|---|---|---|---|
| LUBRICATING OILS, PETROLEUM, BASE OILS, HIGHLY REFINED (IP346 DMSO Extracts <3%) | No | No | No |
| LITHIUM SOAP AND MIXED BASE THICKENERS | No | No | No |
| PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS | No | *** | N982 - Zn |
| BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT | No | 1 000 lbs | No |
| CARBON BLACK | No | No | No |
| ANTIMONY DIALKYLDITHIOCARBAMATE | No | *** | N010 - Sb |

**REGULATORY STATUS**

*** Indicates that no RQ is assigned to this generic or broad class, although the class is a CERCLA hazardous substance. See 50 Federal Register 13456 (April 4, 1985). Values in Section 313 column represent Category Codes for reporting under Section 313.

**CLEAN AIR ACT**

| COMPONENT | CAA Accidental Release Prevention |
|---|---|
| ANTIMONY DIALKYLDITHIOCARBAMATE | No |
| CARBON BLACK | No |
| LUBRICATING OILS, PETROLEUM, BASE OILS, HIGHLY REFINED (IP346 DMSO Extracts <3%) | No |
| LITHIUM SOAP AND MIXED BASE THICKENERS | No |
| PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS | No |
| BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT | No |

**SARA HAZARD CATEGORIES** None

**US STATE REGULATIONS**

| COMPONENT | CA | MA | FL | MN | NJ | PA | RI |
|---|---|---|---|---|---|---|---|
| LUBRICATING OILS, PETROLEUM, BASE OILS, HIGHLY REFINED (IP346 DMSO Extracts <3%) | No | No | No | No | No | No | No |
| LITHIUM SOAP AND MIXED BASE THICKENERS | No | No | No | No | No | No | No |
| PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS | No | No | Yes | Yes | Yes | EH | No |
| BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT | No | Yes | No | No | Yes | EH | No |
| CARBON BLACK | C | Yes | No | No | Yes | HS | No |
| ANTIMONY DIALKYLDITHIOCARBAMATE | No | No | No | No | No | No | No |

**STATE REGULATORY STATUS**

CALIFORNIA PROPOSITION 65: This product may contain the following chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required:

Carbon black (airborne, unbound particles of respirable size), cancer hazard, CAS# 1333-86-4.

PENNSYLVANIA RIGHT-TO-KNOW: This product contains the following chemicals that the state of Pennsylvania has identified as Special Hazardous Substances (SHS), Environmental Hazards (EH), or both (ESHS). The PA regulations require that the MSDS identify all SHS or EH chemicals by chemical name, common name, and CAS Number if they comprise 0.01% or more.
Zinc compounds regulated under CERCLA and SARA 313, Environmental Hazard
Antimony compounds regulated under CERCLA and SARA 313, Environmental Hazard
Benzenesulfonic acid, dodecyl-, sodium salt, Environmental Hazard, CAS# 25155-30-0

**WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM - WHMIS**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

**LABEL(S) FOR SUPPLY**

**CONTROLLED PRODUCT CLASSIFICATION**

D2A - Very Irritating and/or Very Chronically Toxic Materials

**Risk phrases**

Classification per manufacturer.
R-22 Harmful if swallowed.
R-25 Toxic if swallowed.
R-38 Irritating to skin.
R-65 Harmful: may cause lung damage if swallowed.
Xi
Xn

**GLOBAL INVENTORIES**

| COMPONENT | CAN | US | EU | AUS | JAP | KOR | PHLP | CHN |
|---|---|---|---|---|---|---|---|---|
| ANTIMONY DIALKYLDITHIOCARBAMATE | NPRI | Yes | EINECS | Yes | Yes | Yes | Yes | Yes |
| LUBRICATING OILS, PETROLEUM, BASE OILS, HIGHLY REFINED (IP346 DMSO Extracts <3%) | DSL | Yes | EINECS | Yes | Yes | Yes | Yes | Yes |
| LITHIUM SOAP AND MIXED BASE THICKENERS | DSL | Yes | EINECS | No | Yes | Yes | No | No |
| PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS | DSL | Yes | EINECS | Yes | Yes | Yes | Yes | Yes |
| BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT | DSL | Yes | EINECS | Yes | Yes | Yes | Yes | Yes |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CARBON BLACK | DSL | Yes | EINECS | Yes | Yes | Yes | Yes | Yes |

| | |
|---|---|
| | CANADA CEPA: All components of this product comply with new substance notification requirements under the Canadian Environmental Protection Act (CEPA). |
| **USA (TSCA)** | All components in this product are listed on the US Toxic Substances Control Act (TSCA) Inventory or are exempt from TSCA Inventory requirements. |
| **CANADA (DSL)** | All components in this product are listed on the Canada Domestic Substances List (DSL) or are exempt from DSL requirements. |
| **EUROPE (EINECS/ELINCS/NLP)** | All components in this product are listed on the European Inventory of New and Existing Chemical Substances (EINECS), the European LIst of Notified Chemical Substances (ELINCS), or the No Longer Polymers (NLP) list, or are exempt from EU listing requirements. |
| **JAPAN (ENCS)** | All components in this product are listed on the Japan Inventory of Existing and New Chemical Substances (ENCS) or are exempt from ENCS requirements. |
| **PHILIPPINES (PICCS)** | This product contains one or more components that are NOT LISTED on the Philippines Inventory of Chemicals and Chemical Substances (PICCS) and are NOT EXEMPT from PICCS requirements. |
| **AUSTRALIA (AICS)** | This product contains one or more components that are NOT LISTED on the Australian Inventory of Chemical Substances (AICS) and are NOT EXEMPT from AICS requirements. |
| **KOREA (ECL)** | All components in this product are listed on the Korea Existing Chemicals List (ECL) or are exempt from KECL requirements. |
| **CHINA (IECS)** | This product contains one or more components that are NOT LISTED on the China Inventory of Existing Chemical Substances (IECS) and are NOT EXEMPT from IECS requirements. |

## 16. OTHER INFORMATION

**NFPA-HMIS HAZARD RATING**

| | |
|---|---|
| **HEALTH** | Irritation, minor residual injury (1) - HMIS/NFPA |
| **FLAMMABILITY** | Burns only if pre-heated (1) - HMIS/NFPA |
| **REACTIVITY** | Normally Stable (0) - HMIS/NFPA |
| **PERSONAL PROTECTION INDEX** | B - Safety Eyewear and Gloves |
| **Tariff Code (Schedule B)** | 2710.19.3750 Lubricating greases, with or without additives. |
| **REVISION COMMENTS** | Section 1: Name Change<br>Section 1: Product Number<br>Section 1: Manufacturer<br>Section 1: Distributor<br>Section 1: Emergency Telephone<br>Section 16: Tariff Code (Schedule B) |
| **PREPARED BY** | Chemtool, Incorporated |
| **Replacement of MSDS generated** | 2009-01-06 |
| **MSDS No.** | 14037 |

| | |
|---|---|
| **DATE** | 2010-01-27 |
| **DISCLAIMER** | While the information and recommendations set forth herein are believed to be accurate as of the date thereof, the company makes no warranty with respect thereto and disclaims all liability from reliance therein. |
| **INFORMATION SOURCES** | Raw Material MSDS(s). |

*** Information revised since previous MSDS version**

| | |
|---|---|
| **PRINTING DATE:** | 2010-01-27 |

CLOUGH HARBOUR & ASSOCIATES LLP