Dixie Auto Salvage Site Danville, Illinois

Operation, Maintenance and Monitoring Manual

General Electric Company
Environmental Programs
Albany, New York

April 2000

BBL
ENVIRONMENTAL SERVICES, INC.
Remedial Action • Management and Construction

MANUAL

Dixie Auto Salvage Site
Danville, Illinois

Operation, Maintenance and Monitoring Manual

General Electric Company
Environmental Programs
Albany, New York

April 2000

BBL
ENVIRONMENTAL SERVICES, INC.
Remedial Action • Management and Construction
6723 Towpath Road, P.O. Box 66
Syracuse, NY 13214-0066
(315) 446-9120

Table of Contents

Figures:

1. Site Plan
2. Site Plan with Monitoring Well Locations

Appendices:

A. Site Inspection Checklist
B. Ground-Water Sampling from Monitoring Wells Protocol
C. Leachate Disposal Checklist
D. Monitoring Well Sampling Log
E. Site Health and Safety Plan
F. Final Site Survey

1. Introduction

1.1 General

This document presents the Operation, Maintenance, and Monitoring (OMM) Manual for the final cover system, and leachate collection system at the Dixie Auto Salvage Site in Danville, Illinois (Site) as prepared by BBL Environmental Services, Inc (BBLES). This OMM manual describes the Site, final cover system, leachate collection system components, operation and maintenance, sampling and analysis requirements, and health and safety requirements. It is intended that this OMM manual will be utilized by the OMM contractor to provide guidance in proper OMM of the site.

1.2 Background Information

1.2.1 Site Description and History

The site is located between Route 1 and the North Fork Vermilion River (River) approximately 0.6 miles north of the point where Route 1 crosses the River and approximately 1.5 miles north-northeast of the confluence of the River with Lake Vermilion. The area surrounding the site is primarily gently rolling hills with elevation ranging from approximately 650 to 680 feet above mean sea level (msl) (Figure 1). Lower elevations decreasing to approximately 600 feet above msl are present along the River, which is adjacent to the eastern boundary of the site. A wide, relatively flat, floodplain at an elevation of approximately 600 feet msl is located east of the River in proximity to the site.

Land use in the area surrounding the site is primarily residential along both sides of the highway and agricultural in the area to the west of Route 1. The area east of the highway in proximity to the site shows less agricultural use and consists of old fields and woodlands. An active sand/gravel mining operation and additional agricultural land are located approximately 0.5 miles north of the site. The area south of the site also consists of old fields and woodlands and the elevation gradually decreases to the River. Soil in the area is composed primarily of silt loam and fine sandy loam.

A culvert and rip rapped drainage ditch is located in the northwestern corner of the property just north of the developed area. The drainage ditch enters a wooded area with steep side slopes almost immediately after emerging from beneath Route 1 and proceeds eastward through the ravine along the north property boundary until it discharges to the River.

Historically, this 15-acre, semi-rural site was used by the former owner to conduct salvage operations. As part of these salvage operations, asphaltic materials, polychlorinated biphenyl (PCB) capacitors and other debris were disposed of at the site. In the early 1960's the asphaltic materials caught on fire, liquefied, and flowed into an adjacent ravine and the River.

General Electric Company (GE) conducted various investigations at this site and completed a removal action for soils in late 1995. GE purchased most of the site from the previous owner and with United States Environmental Protection Agency (USEPA) implemented a response action.

Remedial activities were performed as a response action by GE from October 1998 to July 1999 under the oversight of the USEPA. During this time, the south side of the River was regraded to an approximate slope of 3:1 (horizontal: vertical) from the upland capping area to the area north of the former residential area. Excavated materials were transported to the consolidation area where they were spread and compacted. Asphalt and buffer soils from the invert of the North Branch Ravine the River intersection westward were excavated to a depth of 1-foot below the asphaltic material and transported to the consolidation area and compacted. The former residential yard and driveway area of the site was excavated to a depth of 1-foot and the materials were relocated to the upland area

of the site for consolidation. A final cover system consisting of a combination of geosynthetic and soil components that provided a low permeability barrier, and a leachate collection system consisting of a leachate collection trench and gravity piping system directing any accumulated leachate to a leachate collection manhole were also constructed.

1.2.2 Related Documentation

This section summarizes documentation related to the OMM of the Site. These related are as follows:

- Site Characterization Report;
- Remedial Action Plan; and
- Final Engineering Report.

The Site Characterization Report was prepared by O'Brien & Gere Engineering, Inc. and dated April 12, 1996. This document defines the extent of contamination at the site.

The Remedial Action Plan was prepared by Blasland, Bouck, & Lee, Inc. (BBL) and dated August 1998. This document present a comprehensive package which outlines the remedial action implementation plan, construction-phase sampling and analysis plan, and health and safety plan.

The Final Engineering Report was prepared by BBL and dated October 1999. This document includes a detailed construction report for construction activities completed at the Site from October 1998 to July 1999, contract drawings, and final site survey maps.

1.3 Operation Maintenance and Monitoring Manual Organization

This OMM Manual is organized into the following sections:

SECTION	PURPOSE
1. Introduction	This section presents an overview of document purpose, a site description, and site history.
2. Site Components Description	This section presents a description of Site components.
3. Operation, Maintenance, and Monitoring	This section presents procedures for Site inspection, ground-water sampling, and leachate removal.
4. Information Management	This section presents a description of record keeping procedures and required reporting.
5. Health and Safety	This section introduces the Site-Specific Health and Safety Plan (HASP) developed for the Site.

2. Site Components Description

2.1 General

The Site components consist of a leachate collection system, final cover system, storm-water management controls, and monitoring wells. These components are described as follows.

2.2 Leachate Collection System

The leachate collection system includes a 2-foot wide trench lined with nonwoven geotextile and a 6-inch diameter High Density Polyethylene (HDPE) perforated coil pipe. The pipe slopes at 0.5 percent towards the leachate collection manhole that is located approximately 4-feet from the interior edge of the final cover anchor trench. 6-inch diameter Polyvinyl chloride (PVC) clean-out pipes are installed at the termination points of both the east and west branches of the leachate collection piping system.

A 6-foot diameter precast-concrete leachate collection manhole with an invert 6-feet below the top of the collection pipe is installed. The leachate collection manhole has a storage capacity of approximately 1,300 gallons of leachate. The pipe penetrations for the east and west branches of the leachate collection piping system were field drilled prior to installation of the collection pipes. The collection pipes were transitioned from 6-inch diameter perforated HDPE coil pipe to 6-inch diameter solid HDPE pipe immediately prior to the penetration into the manhole. The annular space between the solid collection pipe and the manhole's core –drilled holes is filled with non-shrink grout in order to seal the manhole and limit infiltration.

2.3 Final Cover System

The final cover system for the Site consists of a combination of geosynthetic and soil components. The final cover system includes the following components:

- Non-woven geotextile;
- 40 mil HDPE geomembrane (textured);
- Geosynthetic Drainage Composite (GDC);
- 30-inches of protection soil; and
- 6-inches of topsoil with vegetation.

The non-woven geotextile covers the consolidation area with a minimum overlap of 5-inches. On the southern end of the consolidation area the seams were heat treated, while in the consolidation area's 3:1 northern slope's adjacent panels are sewn with polymeteric thread. The 40-mil geomembrane, a textured HDPE, is installed over the geotextile. Adjacent geomembrane panels are joined with a double-wedge fusion weld. The GDC is positioned over the geomembrane. The GDC conveys water to a 4-inch diameter perforated pipe that is placed in a select fill bedding in the anchoring trench lining the south, east and west perimeter. The pipe ultimately drains to one of two storm-water downchutes. The GDC at the north perimeter drains directly onto stabilized bank riprap and Reno mattresses. Adjacent GDC panels are joined by plastic "zip-ties" spaced at 5-feet along the roll-width and spaced 6-inches within the anchor trench. The upper geotextile portion of the GDC is continuously sewn using a polumetric thread. The non-woven geotextile panels and the geomembrane are terminated in the geosynthetic anchor trench while the GDC's northern perimeter extends over the top of the anchor trench and terminates under the northern slope bank stabilization riprap. The soil protection layer covers the consolidation area to a depth of 30-inches over the GDC. The soil protection layer is covered with 6-inches of topsoil.

Anchoring trenches along the eastern, western, and southern perimeter serves both as a geosynthetics anchor and the GDC stormwater infiltration collection trench. The trench is backfilled with Type 1 Select Fill in order to

convey the stormwater collected by the GDC to the 4-inch diameter GDC collection pipe. A GDC is also positioned over the anchor trench to promote stormwater flow to the North Branch Ravine. Final cap elevations and contours are presented in Appendix F.

2.4 Storm-Water Management Controls

Site storm-water management controls include perimeter drainage ditches and midslope drainage swale which were constructed to convey flow to the North Branch Ravine via three downchutes lined with reno mattresses filled with 6-inch thick layer of crushed stone. The perimeter drainage ditches on the south, east, and west side of the final cover system are 3:1 sideslopes and a minimum depth of 18 inches. The midslope drainage swale has a 2:1 slope on the downslope side of the swale while the other sideslope varies. The swales have a minimum depth of 18 inches thick. The stormwater is discharged into the downchutes or directly into the North Branch Ravine.

Downchute areas are lined with 40-mil textured geomembrane with non-woven geotextile placed above the liner. 6-foot wide by 9-foot long by 6-inches thick reno mattresses were placed in the downchutes. The reno mattresses are filled with a six-inch layer of crushed stone. Reno mattresses are also installed in the base of the downchutes to dissipate the energy carried by the stormwater prior to discharge into the North Branch Ravine.

2.5 Monitoring Wells

On the site there are five 2-inch diameter-monitoring wells. Each well is constructed of PVC with a 10 to 15-foot long screen interval. Each well is constructed with sand pack, bentonite seal, and grouted. The risers are terminated at approximately 3-feet above grade surface. Well locations are indicated on Figure 2. Information regarding the monitoring wells is as follows:

MONITORING WELL NAME	BOTTOM OF WELL ELEVATION (FT MSL)	TOP OF SCREEN ELEVATION (FT MSL)	BOTTOM OF SCREEN ELEVATION (FT MSL)	SCREEN LENGTH (FEET)
MW-1	613.8	603.8	613.8	10
MW-2	608.2	618.2	608.2	10
MW-3	576.7	586.7	576.7	10
MW-4	578.7	568.7	578.7	10
MW-5	572.9	593.4	578.4	15

3. Operation, Maintenance, and Monitoring

3.1 General

The purpose of Site OMM is to ensure that the remediation objectives are satisfied through the duration of the Site operation and long-term monitoring activities. Operation of the system consists of the removal and disposal of leachate. Activities performed, as preventive maintenance includes routine work such as inspections, mowing, etc. including non-routine work corrective maintenance undertaken to repair equipment or components of the Site that have been found to be deficient. The schedule for Site OMM is presented in Table 1. The components of the OMM are presented in the following sections.

3.2 General Site Maintenance

3.2.1 Leachate Collection System

The leachate collection system will be inspected during the monthly inspection. The results of the inspection will be recorded on the Site Inspection Checklist (Appendix A). The visual inspection will include an examination of the leachate collection well. Problems identified during the inspection will be investigated and repaired, as necessary.

Identified, defective leachate collection system components(s) will be repaired or replaced, as required, to maintain reliability of the overall system. The maintenance activities will be documented in the Site Inspection Checklist (Appendix A), and recorded in the Site field notebook.

3.2.2 Final Cap

Maintenance activities performed for the final cap will include mowing, routine inspections to determine the status of the Site landscaping, evaluate erosion control and drainage, and identify damage caused by burrowing animals.

Perennial grasses were planted on the final cap to control erosion and stabilize the cap soils. During periods when snow and ice have not accumulated on the surface of the final cap, it will be inspected monthly to identify areas of sparse vegetation, bare spots, stressed, or nonexistent vegetation. The affected area(s) will be reseeded with a perennial grass seed mixture. If erosion is identified on the cap it will be backfilled or regraded, and the area will be reseeded. If differential settlement is observed, an evaluation of the conditions will be undertaken, and mitigative action will be implemented based on the results of the evaluation. In the event pesticide usage is required, it will only be applied by a licensed contractor. No sampling or lawn mowing will be completed during one week following pesticide application.

The vegetative cover (grass areas) inside and outside the fenced area will be mowed twice per year. In conjunction with the mowing, vegetation will be trimmed along the leachate collection manhole, monitoring wells, and perimeter fence as necessary. The vegetation cuttings will not be removed from the Site.

As part of the monthly cap inspection activities, during months of no snow coverage, damage caused by burrowing animals will be evaluated to ensure that the integrity of the underlying HDPE liner is maintained. If the results of the inspections indicate that burrowing animal(s) are residing on the cap, or have caused damage to the cap vegetation, soil, or HDPE liner, measures will be undertaken to remove the animal(s) from the Site. Following removal of the animals(s), the damaged area(s) will be repaired, as required.

3.2.3 Storm Water Management Controls

As part of the monthly inspection, the perimeter drainage ditches, midslope drainage swale, and downchutes will be checked for damage or erosion. The inspection activities will be documented on the Site Inspection Checklist (Appendix A).

3.2.4 Monitoring Wells

Monitoring wells associated with the long-term and operational ground-water monitoring activities will be inspected prior to use. The well locks, casing, and riser will be inspected for wear and damage. If the results of the inspection indicate that the well is deteriorated or damaged, parts will be repaired or replaced, as necessary, or the well will be decommissioned. The determination of whether the well is repaired or decommissioned will be made based on the condition of the well. The inspection activities will be documented on the Site Inspection Checklist (Appendix A).

3.2.5 Perimeter Fence

The site perimeter fence will be inspected monthly, as allowed by snow and ice, to ensure Site security is maintained. If damage is identified along perimeter fence, repairs or replacement work will be performed to restore the fence to its original condition. The inspection activities will be documented on the Site Inspection Checklist (Appendix A).

3.2.6 Site Access Drive

The Site access drive will be evaluated monthly to ensure the drive is in good condition. If damage occurs, or deterioration results from long-term usage, repairs will be performed, as necessary. The inspection activities will be documented on the Site Inspection Checklist (Appendix A).

3.2.7 Snow Removal

Snow removal from the access road will be preformed as necessary for leachate removal activities.

3.3 Monthly Inspections

Monthly Site inspection will typically be preformed during the first full week of the month. During the inspection the OMM contractor will complete the following:

- Visually inspect the final cover system for overall integrity noting any area(s) that may need repair;
- Visually inspect the leachate collection system, including leachate level measurement within the leachate collection manhole noting any area(s) that may need repair;
- Visually inspect the site storm water drainage control features including drainage swales, rip rap, reno-mattresses, and gabions noting any area in need of repair;
- Visually inspect the bird houses within the fence area for damage;

- Visually inspect the Site fence by walking the complete perimeter of the fence noting any damage to the fence and/or access road; and

- Visually inspect monitoring wells noting any damage that may need repair.

The OMM Contractor will complete the Site Inspection Checklist (Appendix A) and make a copy of all checklists and field notes completed during the month and transmit the inspection documentation to the Project Engineer specified in the Project Contact List (Table 2).

3.4 Ground-Water Monitoring

Ground-water monitoring will be performed as follows unless future circumstances warrant otherwise:

- Year 1 and Year 2 – quarterly;
- Year 3 and Year 4 – semi-annual; and
- Year 5 through Year 30 – annual.

The monitoring will be completed during or as close to the first full week of the period. Sampling will be completed per the Ground-Water Sampling from Monitoring Wells Protocol (Appendix B). During each monitoring event, the following samples will be collected:

MONITORING WELLS	PARAMETER	ANALYTICAL METHOD	# OF SAMPLES (PER QUARTER)
MW-1	VOCs	USEPA 8260B	1
	PCBs	USEPA 8082B	1
	Lead	USPEA 6010B	1
MW-4	VOCs	USPEA 8260B	1
	PCBs	USEPA 8082B	1
	Lead	USPEA 6010B	1
MW-5	VOCs	USPEA 8260B	1
	PCBs	USEPA 8082B	1
	Lead	USPEA 6010B	1

Documentation to be completed as specified in Section 4.

3.5 Leachate Removal

Leachate removal from the Leachate collection manhole will be performed on an as needed basis. Leachate removal will be scheduled by using the Leachate Collection Manhole Volume Summary (Table 3) to estimate when the leachate manhole will be close to capacity without exceeding capacity. The leachate loading operation will consist of the withdrawal of leachate from the leachate collection manhole and containment of leachate in a tank truck. The operation will be performed as follows:

- Calculate Leachate Collection Manhole volume by using the Leachate Collection Manhole Volume Conversion Table (Table 4);

- When the transportation contractor arrives on site, visually inspect the interior of the tanker, viewing from the open manway located at the top of the tank (at least 5 feet from opening), to ensure that the tank is empty. Record relevant observations on the leachate disposal Checklist (Appendix C);

- Place spill collection container below the loading/unloading connection on the tank truck;

- Following an acceptable inspection of the tanker, begin loading leachate from the leachate collection manhole into the tank truck. Withdraw leachate from the manhole using the reinforced hose connected to the dewatering pump. The dewatering pump discharge hose will be connected to either a connection on the tank truck or into the top of the tank truck;

- When the tank truck is filled to capacity or the leachate manhole is empty, discontinue loading by shutting of the dewatering pump and close the valve on the tank truck (if a connection to the tank truck was established); and

- Measure the volume of leachate contained in the tank truck by stick measurement, and complete the transportation and disposal documentation requirements. Record the leachate volume on the Leachate Disposal Checklist (Appendix C).

Leachate will be transported via tank truck to the treatment and disposal facility by a licensed waste hauler. The waste hauler will be responsible for the leachate from the time that it is released from the Site to the time that it is received by he treatment and/or disposal facility, and will be licensed to transport waste in accordance with applicable federal, state, and local regulations. Vehicles used by the transportation contractor to transport leachate will be placarded according to the USEPA waste number for the leachate. Appropriate copies of the waste manifest form(s) will be retained by the transportation contractor for record retention.

4. Information Management

4.1 General

Information Management requirements will include maintaining operating and monitoring records that provide detailed description of the Site OMM activities, preparation of monthly summary reports, quarterly ground-water monitoring reports, and preparation and submission of annual reports that summarize Site OMM activities. The requirements for record keeping and report preparation are presented in the following sections.

4.2 Record Keeping

Operating records will be maintained to document the leachate collection, removal, and disposal activities. Data included as part of the operating records will be recorded during the field activities and retained on file by the OMM contractor. The contents of the operating records are described below.

4.2.1 Leachate Removal Checklist

To accurately account for the disposition of removed leachate; a Leachate Disposal Checklist will be completed for each leachate collection, removal, and disposal event. Information to be recorded on the checklist is as follows:

- Date and time of leachate collection, removal, and disposal;
- All personal present at the Site;
- Transportation contractor and treatment and disposal facility;
- Destination of leachate for treatment and disposal and/or waste manifest numbers;
- Leachate levels in the leachate collection manhole prior to and after leachate collection, removal, and disposal operations;
- Volume of leachate transferred from the leachate collection manhole to the tank truck; and
- Operation completion time.

The Leachate Disposal Checklist is presented in Appendix C.

4.2.2 Site Inspection Checklist

The results of the Site inspection activities will be recorded on the Site Inspection Checklist. A Site Inspection Checklist will be completed for each leachate collection, removal, and disposal event, in addition to the monthly Site inspection activities. Information to be recorded on the checklist is presented in Appendix A.

4.2.3 Ground-Water Monitoring Records

Information collected during ground-water sampling events will be recorded on the Ground-Water Sampling Log. A Ground-Water Sampling Log will be completed for each ground-water sampling event performed at the Site. Information to be recorded on the log is presented on the Well Sampling Log (Appendix D). Analytical results supplied to OMM contractor will be retained and presented in the Ground-Water Monitoring Reports and the Annual Reports.

4.2.4 Maintenance Records

Maintenance activities performed at the Site will be described on the Site Inspection Checklist, in addition to a Site Field Notebook. Information recorded as part of the maintenance records will include:

- Date and time of maintenance;
- Personnel performing maintenance;
- Reason for maintenance (i.e. routine, non-routine);
- Description of condition prior to maintenance;
- Description of maintenance activities performed, including parts replaced or repaired; and
- Date of next scheduled maintenance, if necessary.

The Site Inspection Checklist is presented in Appendix A.

4.3 Monthly Summary Report

A monthly summary report will be prepared by the OMM contractor in a memorandum format. The memorandum will summarize activities that were completed at the Site during the month that the memorandum is to cover. Any non-routine events will be described and any analytical results received from the laboratory for sampling completed during the month will be summarized. The memorandum will be transmitted to the GE Contact indicated on the Project Contact List (Table 2).

4.4 Ground-Water Monitoring Reports

Pursuant to the completion of a ground-water-monitoring event, a memorandum will be prepared to summarize the activities that were completed during the monitoring event and the analytical results. Transmitted with the memorandum will be the analytical results received from the laboratory and the Well Sampling Logs (Appendix D) completed by the OMM Contractor. The memorandum will be transmitted to the GE Contact indicated on the Project Contact List (Table 2).

4.5 Annual Report

An annual report summarizing the results of the operation and maintenance and long-term monitoring activities performed at the site will be prepared by the OMM Contractor using the OMM records and laboratory analytical results retained by the OMM Contractor. The report will then be submitted by OMM contractor on behalf of GE to the USEPA. The objective of the annual report is to document field activities and procedures such as leachate collection, removal, and disposal activities, leachate monitoring activities, ground-water monitoring activities, and maintenance and repair activities. The annual report will also provide a schedule for Site activities for the upcoming year. The annual report will contain the following sections:

Introduction – This section will include the purpose and scope of the report, Site background information, and a general overview of the Site.

Operation and Maintenance – This section will include an overview of significant OMM activities. This section also provides a summary of the Site operation.

Ground-Water Monitoring – This section will include an overview of sampling completed in the reporting period and any needed comparison to previous reporting periods or applicable ground-water standards.

Future Tasks – This section will include an overview of the anticipated tasks and operational changes for the next reporting period.

The report will be completed in a timely manor following the completion of the reporting period.

5. Health and Safety

All activities preformed at the Site associated with the OMM of the Site will be conducted in accordance with the Site HASP. A copy of the HASP will accompany personnel to the Site at all time. The Site HASP is included as Appendix E.

Tables

TABLE 1

GENERAL ELECTRIC COMPANY
DIXIE AUTO-SALVAGE SITE

SITE OPERATION, MAINTENACE, AND MONITORING SCHEDULE

ACTIVITY	FREQUENCY	DESCRIPTION
OPERATION		
Remove Leachate	As needed	Pump leachate from leachate collection manhole to a tank truck for off-Site disposal and/or treatment.
SCHEDULED MAINTENANCE		
Site Inspection	Monthly	Inspect the condition of leachate collection system, cap, and Site fence.
Vegetation Removal	Twice Per Year	Mow all grass areas and remove vegetation around all structures where mowing will not reach.
Snow Removal	As needed	Remove snow from access road for leachate removal activities
MONITORING		
Ground-Water Sampling	Quarterly	Collect water samples from monitoring wells MW-1, MW-4, and MW-5 and analyze for PCBs, VOCs, and Lead.

TABLE 2

GENERAL ELECTRIC COMPANY
DIXIE AUTO-SALVAGE SITE

PROJECT CONTACT LIST

COMPANY,TITLE, NAME	ADDRESS	PHONE NUMBER
General Electric Company Corporate Environmental Programs Project Manager Michael Ianniello	Suite 323 320 Great Oaks Office Park Albany, NY 12203	Office: (518) 862-2712 Fax: (518) 862-2702
BBL Environmental Services, Inc. BBLES Officer Lowell W. McBurney, P.E.	6723 Towpath Road Box 66 Syracuse, NY 13214	Office: (315) 446-9120 Fax: (315) 446-5807
BBL Environmental Services, Inc. Project Manager David R. Gerber, P.E.	6723 Towpath Road Box 66 Syracuse, NY 13214	Office: (315) 446-2570 ext. 431 Fax: (315) 449-4111 Cell: (315)-439-0592
BBL Environmental Services, Inc. Technician Brian Loomis	2940 Business One Drive Kalamazoo, MI 49001	Office: (616) 385-3388 Fax: (616) 385- 5828 Cell: (313) 510-6278
BBL Environmental Services, Inc. Technician Todd Washburn	2940 Business One Drive Kalamazoo, MI 49001	Office: (616) 385-3388 Fax: (616) 385- 5828 Cell: (810) 523-6581
BBL Environmental Services, Inc. Project Engineer Lucas B. Cullen	6723 Towpath Road Box 66 Syracuse, NY 13214	Office: (315) 446-2570 ext. 420 Fax: (315) 449-4111
BBL Environmental Services, Inc. Regional Health and Safety Coordinator Greg N. Ertel, CIH, CSP	155 Corporate Woods Suite 150 Rochester, NY 14623	Office: (716) 292-6740, ext. 25 Fax: (716) 292-6715 Cell: (716) 330-0633
Severn Trent Laboratories Project Manager Ronald J. Misiunas	2417 Bond Street University Park, IL 60466	Office: (708) 534-5200 Fax: (708) 534-5211
Waste Technology Services, Inc. Michael C. Oliver	640 Park Place Niagara Falls, NY 14301	Office: (716) 282-4100 Fax: (716) 282-6986

TABLE 3

GENERAL ELECTRIC COMPANY
DIXIE AUTO-SALVAGE SITE

LEACHATE COLLECTION MANHOLE VOLUME SUMMARY

DATE	DEPTH OF LEACHATE (FEET)	TOTAL LEACHATE VOLUME (GALLONS) *	VOLUME CHANGE SINCE LAST MEASUREMENT (GALLONS)

* Use Leachate Collection Manhole Conversion Table to Calculate the Total Leachate Volume.

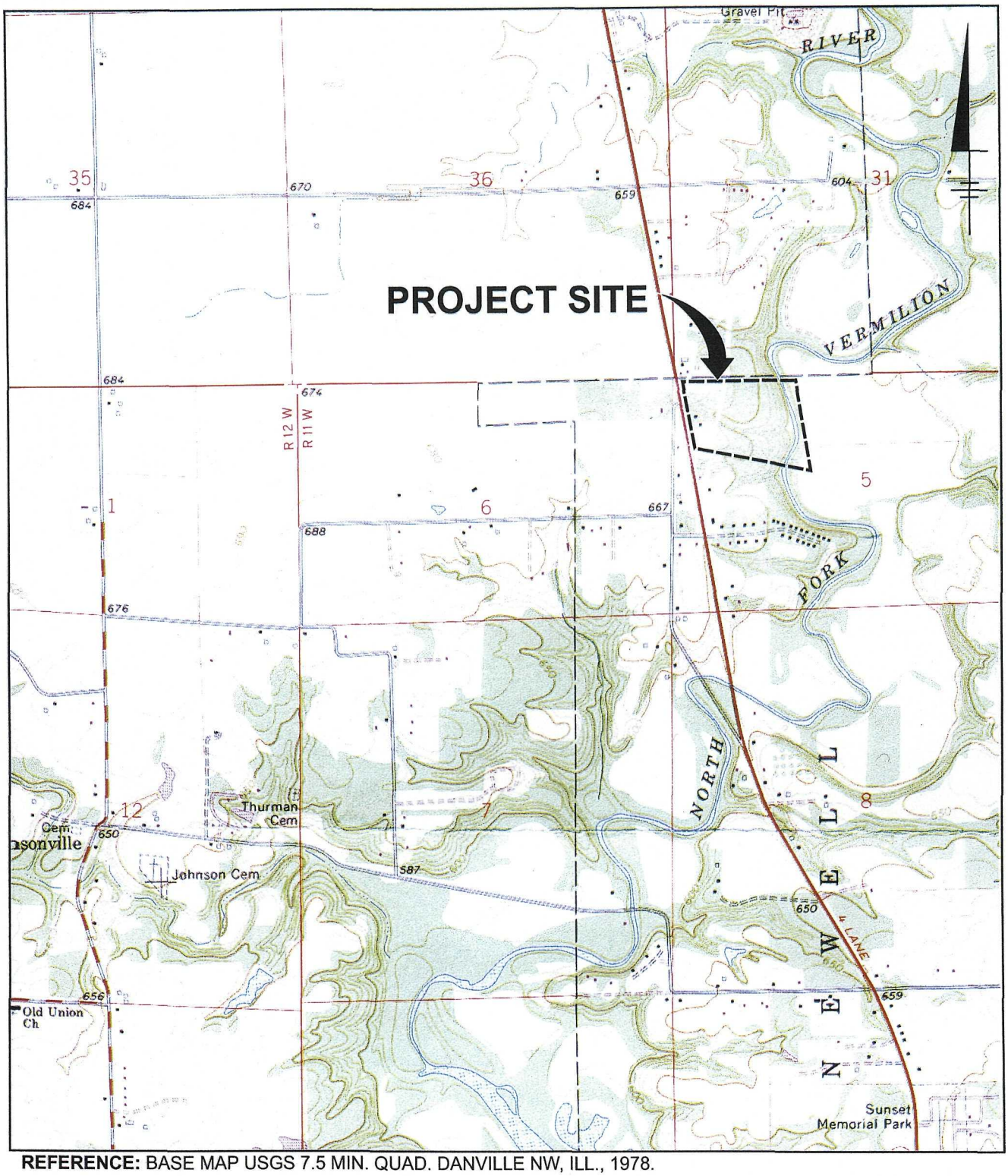
TABLE 4

GENERAL ELECTRIC COMPANY
DIXIE AUTO-SALVAGE SITE

LEACHATE COLLECTION MANHOLE CONVERSION TABLE

DEPTH OF LEACHATE (FEET)	VOLUME OF LEACHATE (GALLONS)	DEPTH OF LEACHATE (FEET)	VOLUME OF LEACHATE (GALLONS)
0.1	21	3.1	655
0.2	42	3.2	676
0.3	63	3.3	698
0.4	85	3.4	719
0.5	106	3.5	740
0.6	127	3.6	761
0.7	148	3.7	782
0.8	169	3.8	803
0.9	190	3.9	824
1.0	211	4.0	846
1.1	233	4.1	867
1.2	254	4.2	888
1.3	275	4.3	909
1.4	296	4.4	930
1.5	317	4.5	951
1.6	338	4.6	972
1.7	359	4.7	994
1.8	380	4.8	1015
1.9	402	4.9	1036
2.0	423	5.0	1057
2.1	444	5.1	1078
2.2	465	5.2	1099
2.3	486	5.3	1120
2.4	507	5.4	1141
2.5	528	5.5	1163
2.6	550	5.6	1184
2.7	571	5.7	1205
2.8	592	5.8	1226
2.9	613	5.9	1247
3.0	634	6.0	1268

Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD. DANVILLE NW, ILL., 1978.

2000' 0 2000'

Approximate Scale: 1" = 2000'

AREA LOCATION

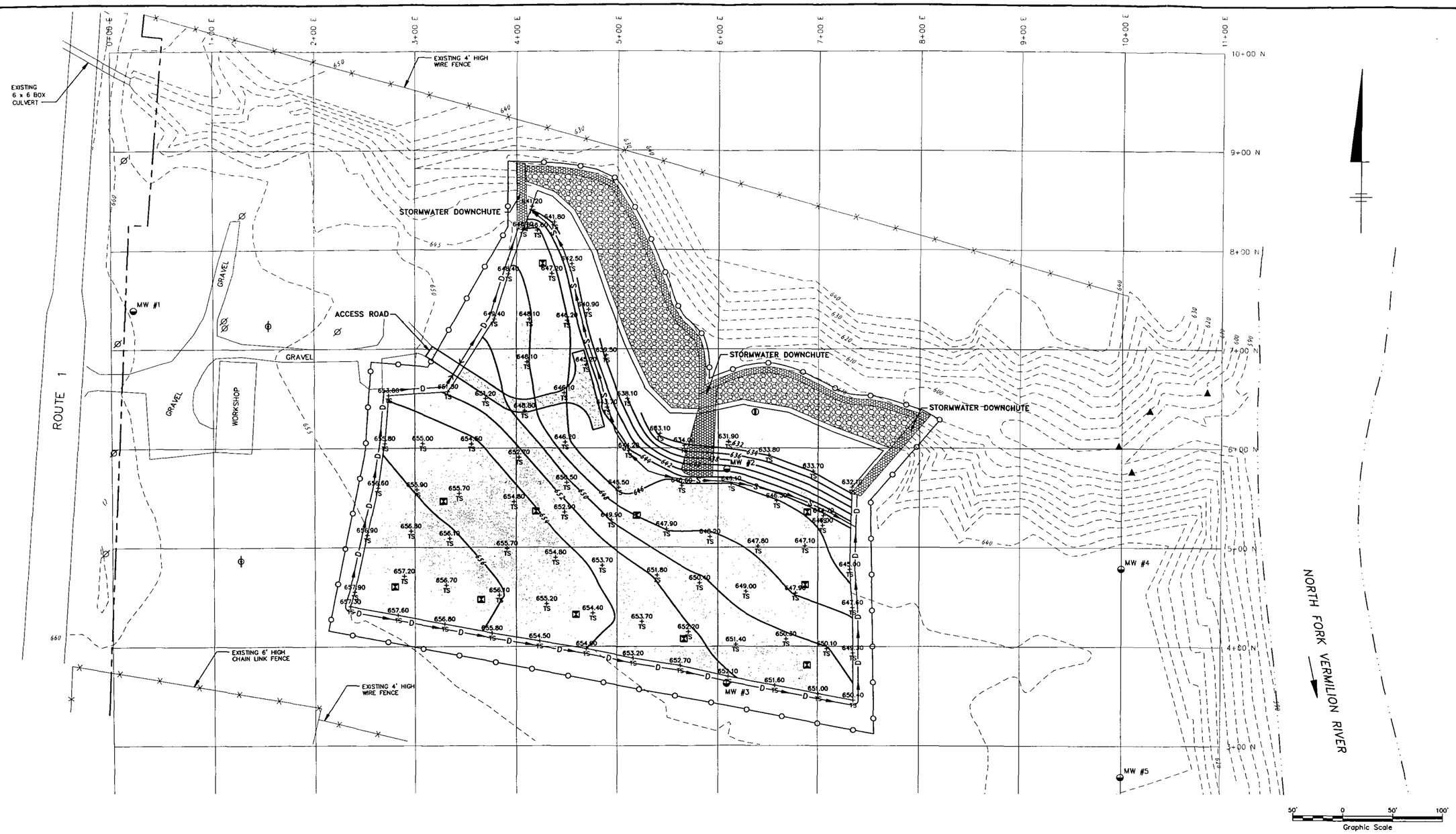
DIXIE AUTO SALVAGE SITE
DANVILLE, ILLINOIS
OPERATION, MAINTENANCE, AND MONITORING MANUAL

SITE PLAN

BBL ENVIRONMENTAL SERVICES, INC.
Remedial Action • Management and Construction

FIGURE 1

02/00 SYR-D54-DJH LBR
10123001/10123n01.cdr



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- 660 EXISTING ELEVATION CONTOUR
- APPROXIMATE EDGE OF WATER
- 650.75 TS TOPSOIL ELEVATION (SEE NOTE 1)
- APPROXIMATE AREA OF TOPSOIL GRADING
- 656 AS-BUILT TOPSOIL ELEVATION CONTOUR
- APPROXIMATE PERIMETER FENCE LINE
- MW #5 APPROXIMATE MONITORING WELL LOCATION
- APPROXIMATE LOCATION OF LEACHATE COLLECTION MANHOLE
- APPROXIMATE LOCATION OF BIRDHOUSE
- APPROXIMATE LOCATION OF BATHOUSE
- D PERIMETER DRAINAGE DITCH
- S MID-SLOPE DRAINAGE SWALE
- RENO MATTRESS
- RIPRAP

NOTES:

1. AS-BUILT ELEVATIONS SHOWN REPRESENT TOP OF TOPSOIL LAYER.
2. ELEVATION DATA AND MONITORING WELL LOCATIONS OBTAINED FROM FIELD SURVEY PERFORMED BY BERNS, CLANCY AND ASSOCIATES, P.C., URBANA, IL, DATED 7/99.
3. LOCATIONS OF LEACHATE COLLECTION MANHOLE, BIRDHOUSES, BATHOUSES, AND STORMWATER DOWNCHUTES ARE APPROXIMATE BASED ON FIELD NOTES RECORDED BY ON-SITE BBL PERSONNEL.

X: 10123X01.DWG
L: ON=*, OFF=REF*
P: STD-POF/DL, D2BL
4/4/00 SYR-54-KMD
10123001/10123G01.DWG

DIXIE AUTO SALVAGE SITE
DANSVILLE, ILLINOIS
OPERATION, MAINTENANCE AND MONITORING MANUAL

SITE PLAN AND MONITORING WELL LOCATIONS

BBL ENVIRONMENTAL SERVICES, INC.
Remedial Action•Management and Construction

FIGURE 2

Appendices

Appendix A – Site Inspection Checklist

GENERAL ELECTRIC COMPANY
DIXIE AUTO SALAVAGE SITE

SITE INSPECTION CHECK LIST

DATE: _____

INSPECTOR: _____

	YES/NO	REPAIRS NEEDED (YES/NO)	COMMENTS
Final cover system's overall integrity is intact.			
The leachate collection system is in good condition.			
The site storm water drainage control features (including drainage swales, rip rap, reno-mattresses, and gabions are in good condition.			
Birdhouses within the fence are in good condition.			
Perimeter fence is in good condition.			

Leachate level measurement (ft) (from top of manhole to top of leachate): _____

Manhole Depth measurement (ft) (from top of manhole to bottom of manhole): _____

Feet of leachate (Manhole Depth measurement - Leachate level measurement): _____

Inspector Signature: _____

Appendix B – Sampling Protocal

Ground-Water Sampling from Monitoring Wells Protocol

I. Introduction

This protocol describes the procedures to be used to collect ground-water samples from monitoring wells MW-1, MW-4, and MW-5. This procedure will be followed on a quarterly basis and will occur with the first half of February, May, August, and November.

II. Materials

The following materials, as required, will be available during ground-water sampling:

- Photoionization detector (PID) –HNU or equivalent;
- Appropriate health and safety equipment;
- Plastic sheeting (for each sampling location);
- Disposable teflon bailers (minimum one per well) or sampling pump with disposable tubing for each well;
- Polypropylene rope;
- Buckets to measure purge water;
- Water level wells probes;
- Appropriate water sampling containers as specified by Severn Trent Labortories;
- One blank (trip) per transport container (for VOC analysis only);
- Transport container (coolers) with ice and appropriate labeling, packing, and shipping materials;
- Chain-of-custody forms;
- Indelible ink pens;
- Site map with well locations;
- Keys to wells and fence; and
- Project sampling logbook.

III. Procedure

The procedure for collection ground-water samples from monitoring wells will be as follows:

1. Review materials check list (Part II) to ensure the appropriate equipment has been aquired.

2. Identify the site and the well to be sampled on sampling logbook, along with date, arrival time, and weather conditions. Identify the personnel and equipment utilized and other pertinent data requested on the logs and Monitoring Well Sampling Log.

3. Properly label all sample containers.

4. Don safety equipment, as required. New disposable gloves will be donned prior to collecting ground-water samples at each monitoring well.

5. Place plastic sheeting adjacent to well to use a clean work area.

6. Establish the background reading with an HNU and record the reading on the field log and Monitoring Well Sampling Log.

7. Remove lock from well and if rusted or broken replace with new lock.

8. Unlock and open the well cover while standing upwind standing upwind of the well. Remove well cap and place on the plastic sheeting. Insert HNU probe in the breathing zone above the well casting. Proceed if HNU reading is below 1 (part per million) ppm. If HNU reading is above 1 ppm, move upwind from well for approximately 5 minutes to allow the well headspace volatile to dissipate. Repeat HNU reading.

9. Obtain a water level depth and bottom of well depth using an electric well probe and record on sampling logbook. Clean the well probe after each use with a soapy (Alconox) water wash and a distilled water rinse. [Note: water levels may be measured at all wells prior to initiating any sampling activities.

10. Calculate the number of gallons of water in the well using the length of water column (in feet) multiplying by 0.163 for a 2-inch-diameter well. Record the well volume on the ground-water-sampling logbook and Monitoring Well Sampling Log.

11. Remove the required purge volume of water from the well (measure purge water volume in measuring bucket). The required purge volume shall be three well volumes, unless the well runs dry, in which case the water that comes into the well will be sampled (RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, EPA, September 1986). All purge water shall be discharged to the surface at the well head.

12. After the appropriate purge volume of ground water in the well has been removed or if the well has been bailed dry and allowed to recover, obtain the ground water sample needed for analysis, specified on Table 1, with a bailer and pour the ground water directly from the sampling device into the appropriate container and tightly screw on the caps.

13. Place the custody seal around the cap and the sampler container. Note the time on the sample label. Secure with packing material and store at 4 °C on wet ice in an insulated transport container provided by the laboratory.

14. Cap and lock well.

15. Record the time the sampling procedures were completed in the sampling logbook and Monitoring Well Sampling Log.

16. Place all disposable sampling material (plastic sheeting, bailer (if used), and health and safety equipment) in an appropriately marked 55-gallin container at the site. Go to next well and repeat Steps 1 through 16 for each monitoring well as required.

Appendix C – Leachate Disposal Checklist

BBL ENVIRONMENTAL SERVICES, INC.

GENERAL ELECTRIC COMPANY
DIXIE AUTO SALAVAGE SITE

LEACHATE DISPOSAL CHECK LIST

DATE: _____ WASTE MANIFEST NUMBER: _____

TIME: _____

PERSONAL 1 (Name/Company) _____

PERSONAL 2 (Name/Company) _____

PERSONAL 3 (Name/Company) _____

PERSONAL 4 (Name/Company) _____

Transportation Contractor EPA/IL ID#	
Destination of Leachate	
Leachate level measurement (feet) (from top of manhole to top of leachate)	
Manhole Depth measurement (feet) (from top of manhole to bottom of manhole)	
Feet of leachate (Manhole Depth measurement - Leachate level measurement)	
Gallons of Leachate Transferred to Tank Truck	

Comments:

_____

_____

_____

_____

Completion Time: _____

Appendix D – Monitoring Well Sampling Log

GENERAL ELECTRIC COMPANY
DIXIE AUTO SALAVAGE SITE

MONITORING WELL SAMPLING LOG

DATE _____ Weather _____

Well Number _____

Excavation Method _____

Depth to Bottom of Well _____ feet

Depth to Top of Water _____ feet

Depth of Water Column _____ gallon(s)

Water Volume ft – gallons

Depth of Water Column X 0.163

Volume of Water in Well _____ gallon(s) Purge Volume _____ gallon(s)
(4 X Volume of water in Well)

Measurements taken from: ☐ Top of Well Casing ☐ Top of Protective Casing ☐ Other_____

PID Reading _____ (PPMV)

Physical Appearance at Sample

Color _____

Odor _____

Sheen/Free Product _____

Parameters of Sampling

CONTAINER SIZE	CONTAINER TYPE	# COLLECTED	PRESERVATIVE

Notes:

Appendix E – Site Health and Safety Plan

BBL ENVIRONMENTAL SERVICES, INC.

Dixie Auto Salvage Site
Danville, Illinois

Health and Safety Plan for Operation, Maintenance and Monitoring

General Electric Company
Environmental Programs
Albany, NY

April 2000

Dixie Auto Salvage Site
Danville, Illinois

Health and Safety Plan for Operation, Maintenance and Monitoring

General Electric Company
Environmental Programs
Albany, NY

April 2000

BBL
ENVIRONMENTAL SERVICES, INC.
Remedial Action • Management and Construction
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
(315) 449-3105

Approvals and Acknowledgments

Approvals

I have read and approved this HASP with respect to project hazards, regulatory requirements, and BBLES procedures.

Project Name: Dixie Auto Salvage Site - Operation Maintenance and Monitoring Activities - Danville Illinois

Project Number: 10123

_____ _____

Project Manager/Date Corporate HS Representative/Date

_____

Project/Site HS Staff/Date

Acknowledgments

The final approved version of this HASP has been provided to the Site Supervisor. I acknowledge my responsibility to provide the Site Supervisor with the equipment, materials and qualified personnel to implement fully all safety requirements in this HASP. I will formally review this plan with the HS Staff every six months until project completion.

_____ _____

Project Manager Date

I acknowledge receipt of this HASP from the Project Manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the Project Manager and/or the Health and Safety Representative.

_____ _____

Site Supervisor Date

Health and Safety Plan Acknowledgment

I have read this Site-Specific Health and Safety Plan, or its contents have been presented to me, and I understand the contents, and I agree to abide by its requirements.

Name (Print)	Signature	Representing	Date

Table of Contents

F Accident Investigation Report
G Hospital Route

1. Introduction

1.1 Objective

This Health and Safety Plan (HASP) has been prepared for the performance of operation and maintenance and long-term monitoring activities at the Dixie Auto Salvage Site located in Danville, Illinois. A detailed description of the requirements, methods, and procedures for conducting operation and maintenance and long-term monitoring at the Site is presented in the Operation and Maintenance and Long-Term Monitoring Plan. As described in the Operation and Maintenance and Long-Term Monitoring Plan, Site activities may include the following components:

- Ground-water, leachate, surface water, and sediment monitoring;
- Leachate collection system operation, maintenance, and repair;
- Leachate flow and volume measurement;
- Leachate handling, loading, and transfer;
- Cap inspection;
- Cap mowing/seeding;
- Weed control;
- Inspection and repair of damage by burrowing animals;
- Foliage control; and
- Snow removal.

The objective of this plan is to provide a mechanism for establishing safe working conditions at the Site. The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of accident or injury.

1.2 Site and Facility Description

The Operation, Maintenance and Monitoring Manual was written by BBL Environmental Services, Inc. (BBLES), for Site operations, maintenance, and monitoring at the Site, and provides a detailed description of the requirements, methods, and procedures for conducting operation and maintenance and long-term monitoring activities. Section 1 of the Operation, Maintenance and Monitoring Manual provides a detailed description of the Site, Site history, and current operations.

1.3 Policy Statement

The policy of BBLES is to provide a safe and healthful work environment for all employees. No aspect of operations is of greater importance than injury and illness prevention. A fundamental principle of safety is that all accidents and injuries are preventable. BBLES will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or accident.

This HASP prescribes the procedures that must be followed during Site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Regional Health and Safety Coordinator. This document will be periodically reviewed to ensure that it is current and technically correct. This HASP shall be used in conjunction with the corporate health and safety manual in Appendix A. Any changes in Site conditions and/or the scope of work will require a review and modification to the HASP. Such changes will be completed in the form of an addendum to this plan or a revision of the plan.

The provisions of this plan are mandatory for all BBLES personnel and the BBLES subcontractors assigned to the project. All visitors to the work site must also abide by the requirements of the plan. It should be acknowledged

that the employees of other consulting and/or contracted companies may work in accordance with their own independent HASPs. Subcontractor HASPs, if prepared, must meet the requirements of this HASP.

1.4 References

This HASP complies with applicable Occupational Safety and Health Administration (OSHA) regulations, USEPA regulations, and prime contractor health and safety policies and procedures. This plan follows the guidelines established in the following:

- *Standard Operating Safety Guides*, USEPA (Publication 9285.1-03, June 1992).
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH, OSHA, USCG, USEPA (86-116, October 1985).
- Title 29 of the Code of Federal Regulations (CFR), Part 1910.120.
- Title 29 of the Code of Federal Regulations (CFR), Part 1926.
- *Pocket Guide to Chemical Hazards*, DHHS, PHS, CDC, NIOSH (1994).
- *Threshold Limit Values*, ACGIH (1999).
- *Quick Selection Guide to Chemical Protective Clothing*, Forsberg, K. and S.Z. Mansdorf, 2nd Ed. (1993).
- *Health and Safety Policies and Procedures Manual*, BBL.

1.5 Definitions

The following definitions are applicable to this HASP:

- ***Site*** - the area where the work is to be performed by prime contractor personnel.
- ***Project*** - all on-site work performed under the scope of work for the operation and maintenance and long-term monitoring activities.
- ***Subcontractor*** - includes subcontractor personnel hired by BBLES, the prime contractor for Site operations, maintenance, and long-term monitoring.
- ***On-Site Personnel*** - all client personnel, prime contractor, and prime contractor subcontractor personnel at the Site and directly involved with the project.
- ***Visitor*** - all other personnel, except the on-site personnel. All visitors must receive approval to enter the Site.

2. Roles and Responsibilities

2.1 All Personnel

All BBLES and subcontractor personnel must adhere to the following procedures during the performance of their work. Each person is responsible for completing tasks safely, and reporting any unsafe acts or conditions to his or her immediate supervisor or to the prime contractor Site Supervisor/Health and Safety Specialist (SS/HSS). No person may work in a manner that conflicts with these procedures. After due warnings, the PM or the SS/HSS will dismiss from the Site any person who violates safety procedures.

All on-site personnel will receive training in accordance with 29 CFR 1910.120 as required by applicable OSHA standards. In addition, project personnel will be familiar with the requirements and procedures contained in this document prior to the beginning of project operations.

The roles of key prime contractor personnel are outlined in the following sections. Key personnel and contacts are summarized in Table 2-1.

2.2 Corporate Health and Safety Associate

The Corporate Health and Safety Vice President (CSVP) is responsible for all corporate health and safety aspects of the project. Inquiries regarding prime contractor corporate procedures, project procedures, and other technical or regulatory issues should be addressed to this individual.

2.3 Regional Health and Safety Coordinator

The Regional Health and Safety Coordinator (RHSC) is also responsible for technical health and safety aspects of the project, including review and approval of this HSCP. Inquiries regarding prime contractor corporate procedures, project procedures, and other technical or regulatory issues also may be addressed to this individual. The RHSC will conduct semi-annual inspections/audits of the project Site, including a review of periodic inspections conducted by the SS/HSS and a comprehensive review of Site conditions. Any changes or addenda to this HASP must be approved by the RHSC or the CSA.

2.4 Site Supervisor/Health and Safety Specialist (SS/HSS)

The SS/HSS is responsible for implementation of the HASP, including communication of Site requirements to all on-site project personnel (including subcontractors). The SS/HSS will be responsible for informing the PM of any changes in the work plan or procedures so that those changes may be addressed in the HASP. The SS/HSS will advise the PM on health and safety issues, and will establish and oversee the project air monitoring program. The SS/HSS is the primary Site contact on occupational health and safety matters. Other responsibilities include:

- Conduct periodic safety inspections of the Site during the operation and maintenance and long-term monitoring activities, and completing a periodic inspection form (Appendix B);
- Perform and document daily safety briefings when subcontractors are on site;
- Stop work, as required, to ensure personal safety and protection of property, or in cases of life- or property-threatening safety non-compliance;
- Obtain a Site map and determining and posting routes to medical facilities and emergency telephone numbers, and arranging emergency transportation to medical facilities;

- Notify local public emergency officers of the nature of the Site operations, and posting of their telephone numbers in an appropriate location;
- Observe on-site project personnel for signs of chemical or physical trauma;
- Verify that all Site personnel, including subcontractors, have received the proper medical clearances and training in accordance with the requirements of this HASP;
- Verify that all on-site personnel are made aware of the provisions of the HASP and have been informed of the nature of any physical, chemical, and biological hazards associated with the Site activities;
- Verify that on-site personnel and visitors have received the required training, including instructions for safety equipment and personal protective equipment (PPE) use;
- Suspend work if health- and/or safety-related concerns arise;
- Issue/obtain required work permits;
- Conduct Site and personal air monitoring, including equipment maintenance and calibration. Where necessary, submit samples to an American Industrial Hygiene Association (AIHA) accredited laboratory;
- Prepare material for Site safety orientation training and safety meetings;
- Verify that on-site personnel have received the required physical examinations and medical certifications;
- Review Site activities with respect to compliance with the HASP; and
- Maintain required health and safety documents and records.

2.5 Project Manager

The PM is ultimately responsible for verifying that all project activities are completed in accordance with the requirements and procedures in this plan. The PM is responsible for providing the Site Supervisor (SS) with the equipment, materials, and qualified personnel to implement fully all safety requirements in this HASP.

It is the responsibility of the PM to:

- Review safety inspection reports;
- Thoroughly investigate all accidents and incidents on the project;
- Approve, in writing, addenda or modifications of this HASP; and
- Suspend work if health- and/or safety-related concerns arise.

2.6 Subcontractors

On-site subcontractors and their personnel must understand and comply with the Site requirements established in this HASP. Subcontractors must provide documentation of training and enrollment in a medical surveillance program consistent with the requirements of this HASP. Subcontractors may prepare their own task-specific

HASPs, which must be consistent with the requirements of this HASP. Subcontractor personnel must attend and participate in the Daily Safety Meetings and all other Site safety meetings.

2.7 On-Site Personnel and Visitors

All personnel must read and acknowledge their understanding of this HASP, abide by the requirements of the plan, and cooperate with Site supervision in ensuring a safe work site. Site personnel will immediately report any of the following to the SS/HSS:

- Accidents and injuries, no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Symptoms of chemical exposure;
- Unsafe or malfunctioning equipment;
- Changes in Site conditions that may affect the health and safety of project personnel;
- Damage to equipment or property; and
- Situations or activities for which they are not properly trained.

TABLE 2-1
KEY PERSONNEL

General Electric Company		
Title/Role	**Name**	**Address/Telephone No.**
Project Manager	Mr. Michael Ianniello	320 Great Oaks Office Park Suite 323 Albany, NY 12203 (518) 534-5200
BBLES, Inc. Personnel		
Role	**Name**	**Address/Telephone No.**
Corporate Health and Safety Vice President	Jay D. Keough, CIH	8 South River Road Cranbury, NJ 08512 (609) 860-0590
Regional Health and Safety Coordinator	Greg N. Ertel, CIH, CSP	155 Corporate Woods, Suite 150 Rochester, NY 14623 (716) 292-6740, ext. 25 cell: (716) 330-0633
BBLES Site Health and Safety Supervisor/BBLES Site Supervisor	Brain Loomis	2940 Business One Drive Kalamazoo, MI 49001 (616) 385-3388
Project Manager	David R. Gerber, P.E.	6723 Towpath Road, Box 66 Syracuse, NY 13214-0066 (315) 446-9120
Project Officer, P.E.	Lowell W. McBurney	6723 Towpath Road, Box 66 Syracuse, NY 13214-0066 (315) 446-9120

3. Project Hazards and Control Measures

3.1 Scope of Work

The scope of the operation, maintenance and monitoring activities includes the following field activities:

- Ground-water, leachate, surface water, and sediment monitoring;
- Leachate collection system operation, maintenance, and repair;
- Leachate flow and volume measurement;
- Leachate handling, loading, and transfer;
- Cap inspection;
- Cap mowing/seeding;
- Weed control;
- Inspection and repair of damage by burrowing animals;
- Foliage control; and
- Snow removal.

3.1.1 Job Hazard Assessment

The following job hazard assessment identifies potential safety, health, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the work site to identify hazards that may affect Site personnel, the community, or the environment. The SS must be aware of these changing conditions and discuss them with the PM whenever these changes impact employee health, safety, the environment, or performance of the project. The SS will keep prime contractor personnel and subcontractors informed of the changing conditions, and the PM will write or approve addenda or revisions to this HASP as necessary.

3.2 Field Activities, Hazards, Control Procedures

The following sections present the hazards and safety procedures for activities outlined in the scope of work for the Site. Specific activities may be grouped into sections with other activities based on similar hazards and safety precautions for the activities.

3.2.1 Mobilization and Inspection Activities

Site mobilization and inspection activities may include setting up equipment and establishing a temporary Site facilities. Inspection activities may specifically include the following:

- Cap inspection;
- Inspection of the leachate collection system components;
- Inspection for damage by burrowing animals.

During these activities, project personnel will walk the Site to confirm the existence of anticipated hazards, and identify safety and health issues that may have arisen since the writing of this plan.

Manual materials handling and manual Site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitos, wasps, spiders, snakes, dogs, and deer; weather, such as sunburn, lightning, rain, and heat-related illnesses; and pathogens, such as rabies, lyme disease, and blood-borne pathogens. Control procedures for these hazards are discussed in Section 4.

Confined space hazards may be encountered if entry into the leachate collection manhole is required. This work area has limited means of entry and exit, and is not designed for continuous employee occupancy. Potentially contaminated surfaces, leachate, and sediment pose additional hazards, and air contamination, flammable or explosive atmosphere, and oxygen deficiency are potentially present.

Chemical hazards may be encountered if a confined space entry is required into the leachate collection manhole, or if leachate or ground water is removed from site monitoring wells or the leachate collection manhole. The associated health hazards include dermal contact and inhalation.

3.2.2 Field Sampling Activities

Field sampling operations consist of the collection of ground-water, and leachate for subsequent analysis and evaluation of potential Site impact. The physical hazards of these operations are primarily associated with the sample collection methods and procedures utilized.

Samples of ground water and leachate will be obtained to evaluate the extent of potential Site impact and system efficiency. Inhalation and absorption of constituents (skin contact) are the primary routes of entry associated with ground-water and leachate sampling due to the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. To control dermal exposure during sampling activities, a minimum of Modified Level D protection will be worn. Air sampling may be conducted during ground-water and leachate sampling to assess the potential for exposure to airborne constituents. If the results of air monitoring indicate the presence of organic vapors in a concentration exceeding the Site action level for Modified Level D, personnel will upgrade to Level C protection. Refer to Section 8 for a description of air monitoring requirements and action levels. A description of each level of protection is included in Section 5.

During the course of this project, several different sampling methodologies may be utilized based on equipment accessibility and the types of materials to be sampled. The primary hazards associated with the specific sampling collection procedures are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards of the sampling procedures are generally limited to strains/sprains and potential eye hazards resulting from sampling activities.

3.2.3 General Maintenance

Site maintenance activities may include the following:

- Cap mowing and seeding;
- Weed control;
- Repair of damage caused by burrowing animals;
- Foliage control; and
- Snow removal.

These activities may involve a potential for exposure to numerous physical and health hazards. The hazards are primarily associated with the equipment used and the debris being removed.

Physical Hazards - The physical hazards involved with clearing and construction relate to work done with heavy equipment, hand tools, and the environment itself. There exists a potential for incidents involving personnel struck by or struck against powered equipment, timber, or materials, resulting in fractures, cuts, punctures, or abrasions. Walking and working surfaces during construction activities may involve slip, trip, and fall hazards. Working at elevations may create a fall hazard. Confined spaces may present a hazard.

Environmental Hazards - Overgrown areas present hazards of uneven walking surfaces, soft terrain, and biological hazards such as insects and snakes.

Working Surfaces - Uneven terrain and slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, and slips and falls. All personnel should frequently inspect the area in which they are working, and keep the area as clear as possible.

Powered Equipment Operations - Site workers are exposed to serious hazards during clearing when using powered equipment. Workers may be struck by blades or by material thrown by powered equipment.

Materials Handling - The most common type of accident that occurs in material handling operations is the "caught between" situation when a load is being handled and a finger or toe gets caught between two objects. Extreme care must be taken when loading and unloading material. Proper lifting technique must be employed, and mechanical means must be used to lift objects whenever possible.

Health Hazards - Due to the type of work involved in clearing and construction activities, the primary health hazards involve repetitive motion disorders, lifting, and other ergonomic stressors. Noise may also present a hazard. Operation of heavy equipment and power actuated and pneumatic hand tools frequently results in high noise levels.

Fall Hazards - Site workers may perform work in the vicinity of unprotected sides and edges above surrounding surfaces. Work areas should be designed to support personnel, and unprotected sides and edges 6 feet above surrounding surfaces should have appropriate fall protection mechanisms.

Control - Prior to initiating clearing and construction activities, the operation will be explained to all employees. Hazards will be identified and protective measures will be explained. Equipment will be inspected and in proper working condition. Employees should receive training to address the equipment, its operations, and care. Personnel should be scheduled in a manner to reduce the likelihood of performing repetitive tasks for prolonged periods. Mechanical assistance should be provided for large lifting tasks. Hearing protection is required for use when exposed to noise levels exceeding 85 dBA, or a level which commonly results in difficult conversation.

Confined space entry requirements are described in Section 3.5.1.

3.2.4 Routine Operation and Monitoring Activities

Routine operation and maintenance and long-term monitoring activities include the following:

- Ground-water, and leachate monitoring;
- Leachate collection system operation;
- Routine operation and control procedures;
- Leachate volume measurement; and
- Leachate loading and transfer.

Routine operation and maintenance and long-term monitoring activities involve potential exposures to numerous physical and health hazards. The hazards are primarily associated with the leachate, equipment, and activities being conducted.

Physical Hazards - The physical hazards involved with inspection, cleaning, and repair relate to work done on equipment, use of hand tools, materials handling, and the work environment itself. There exists a potential for incidents involving personnel struck by or struck against moving equipment parts or materials, resulting in fractures, cuts, punctures, or abrasions. Walking and working surfaces during activities may involve slip, trip, and fall hazards. Working in or near confined spaces may present a hazard. Uncontrolled hazardous energy also is a potential hazard.

Environmental Hazards - Outside work areas may present hazards of uneven walking surfaces, slick or slippery work surfaces, soft terrain, heat stress, and cold stress.

Working Surfaces - Uneven terrain and slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, and slips and falls. All personnel should frequently inspect the area in which they are working, and keep the area as clear as possible.

Equipment Operations, Maintenance and Repair - Site workers are exposed to serious hazards during activities on powered equipment. Workers may be struck by moving part or by flying material thrown by powered equipment. The potential for exposure to hazardous energy or accidental start-up exists and must be controlled with appropriate lockout/tagout procedures outlined in Section 4.7.

Materials Handling - The most common type of accident that occurs in material handling operations is the "caught between" situation when a load is being handled and a body part gets caught between two objects. Extreme care must be taken when loading and unloading material. Proper lifting technique must be employed, and mechanical means must be used to lift objects whenever possible.

Health Hazards - Due to the type of work involved in the operation and maintenance and long-term monitoring activities, the primary health hazards involve repetitive motion disorders, lifting, and other ergonomic stressors. Noise may also present a hazard. Exposure to media containing Site constituents of concern is possible. During leachate collection and transfer, and Site monitoring activities, personnel may handle ground water, leachate, surface water, and sediment. These materials present a potential inhalation, skin contact, and eye contact hazard. PPE specified in Section 5 shall be utilized for handling leachate.

Chemical Hazards - Workers performing routine operation and long-term monitoring activities may be exposed to VOC-contaminated media, such as leachate and ground water. Proper protective equipment should be worn to protect against dermal contact and, if necessary, appropriate levels of respiratory protection should be employed.

Fall Hazards - Site workers may perform work in the vicinity of unprotected sides and edges above surrounding surfaces. Work areas should be designed to support personnel, and unprotected sides and edges 6 feet above surrounding surfaces should have appropriate fall protection mechanisms.

Electrical Hazards - Site workers may perform work with portable electrical equipment, as well as leachate pump controls. The potential for electric shock exists. Proper electrical safety measures must be employed, as described in Sections 4.6 and 4.7.

Control - Prior to initiating any operation and maintenance and long-term monitoring activities, the operations will be explained to all employees. Hazards will be identified and protective measures will be explained. Equipment will be inspected and in proper working condition. Employees should receive training to address the equipment,

its operations, and care. Personnel should be scheduled in a manner to reduce the likelihood of performing repetitive tasks for prolonged periods. Mechanical assistance should be provided for large lifting tasks. Hearing protection is required for use when exposed to noise levels exceeding 85 dBA, or a level which commonly results in difficult conversation. Procedures for dealing with confined spaces are presented in the following sections.

3.2.4.1 Confined Space Entry

This section contains general requirements and procedures for working with confined spaces. In addition to the general information provided herein, BBLES personnel must comply with the requirements of the prime contractor's policy and procedure requirements for Confined Space Entry. A confined space is defined as a space large enough and so configured that an employee can bodily enter and perform assigned work, has limited means for entry or exit, and is not designed for continuous employee occupancy. Some confined space work may pose additional hazards such as air contamination, flammable or explosive atmosphere, and oxygen deficiency. Confined space entry may pose the possibility of engulfment. Personnel must be properly trained in order to supervise and participate in confined space entry procedures or serve as standby attendants.

All confined spaces are initially considered permit-required and procedures for entry must be consistent with the requirements of BBLES corporate policy and procedure requirements for Confined Space Entry (Appendix A).

3.2.4.2 Confined Space Identification and Designation

Identification: The prime contractor SS/HSS is responsible for identifying all confined spaces into which prime contractor employees or subcontractors will enter. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space. The client is responsible for identifying and providing information as to contents, expected atmosphere, and rescue procedures for all confined spaces on his/her property. If a space is not considered permit required by the client but meets the criteria of this procedure, it shall be considered permit required for prime contractor-managed entry. If a space does not meet the criteria in this procedure but is considered permit-required by the client, it will be considered a permit-required confined space by the prime contractor.

The permit-required confined spaces for this project include, but is not limited to: leachate collection manhole.

3.2.5 Ground-water Monitoring Activities

The ground-water monitoring program will involve uncapping, purging (pumping water out of the well), sampling, and performing measurements at existing monitoring wells. A mechanical pump may be utilized to purge the wells and can be hand-, gas-, or electric-operated. Samples collected from the wells will be placed in containers and shipped to an analytical laboratory for analysis.

During the course of this project, several different sampling methodologies may be utilized based on equipment accessibility and the types of materials to be sampled. These sampling methods may include hand or mechanical bailing. The primary hazards associated with these specific sampling methods are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards of these types of sampling methods are generally limited to strains/sprains resulting from hand bailing and potential eye hazards resulting from water sampling activities.

In addition to the safety hazards specific to sampling operations, hazards associated with sample preservatives will be a concern. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces.

Freezing-weather hazards include frozen, slick and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces and unstable soil.

Exposure to impacted water is possible. Organic vapors will be monitored according to Section 8, Air Monitoring. In accordance with Section 5, decisions on personal protective equipment (PPE) for the chemical hazards will be based on measurements made before and during work activities. Control procedures for environmental and general hazards are discussed in Section 4.0.

Exposure to concentrated acids is possible during sample preservation activities. Appropriate dermal and eye protection should be provided, as described in Section 5.

3.2.6 Equipment Decontamination

All equipment which comes in contact with ground water and leachate will be decontaminated before leaving the Site. Personnel involved in decontamination activities may be exposed to skin contact with contaminated materials and chemicals brought to the Site as part of the project work. Personnel involved in decontamination activities must wear PPE specified in Section 5.

3.3 Chemical Hazards

The chemical hazards associated with Site operations are related to inhalation, ingestion, and skin exposure to ground-water and leachate containing Site constituents of concern (COC). Site COC include Polychlorinated biphenyles (PCBs). Chemical hazards also include materials brought on the Site as part of the operation and maintenance and long-term monitoring activities. Operation and maintenance and long-term monitoring-related chemicals include, but may not be limited to the following: pump oil and lubricants, and sample preservatives.

Airborne concentrations of COCs may be measurable during tasks involving ground water and leachate and will require air monitoring of potentially airborne COC during such operations. Air monitoring requirements for Site tasks are outlined in Section 8.1.

The potential for inhalation of COC during Site tasks is low to moderate. The potential for dermal contact with ground water, leachate, and sediment during sampling and tasks involving leachate collection, removal, and disposal operation and maintenance activities is moderate.

The Material Safety Data Sheets (MSDS) for COC and chemicals brought on to the Site for the operation and maintenance and long-term monitoring activities are included in Appendix C.

TABLE 3-1
CHEMICAL HAZARD INFORMATION

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Polychlorinated biphenyls (PCB) (Aroclor 1242) [53469-21-9] and (Aroclor 1254) [11097-69-1]	?	?	Inh Ing Abs Con	Aroclor 1242: irritated eyes; chloracne; acne-form dermatitis; mildly toxic by ingestion. Poison by subcutaneous route. Carcinogenic. Aroclor 1254: irritated eyes and skin; acne-form dermatitis; poison by intravenous route. Moderately toxic by ingestion and intraperitoneal routes. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	Aroclor 1242: 1 mg/m^3 (skin) 1 mg/m^3 (skin) 0.001 mg/m^3 Aroclor 1254: 0.5 mg/m^3 (skin) 0.5 mg/m^3 (skin) 0.001 mg/m^3		PEL TLV REL PEL TLV REL	Ca [10 mg/m^3] Ca [5 mg/m^3]

Notes:
[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.
[d]STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
[e]PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).
TLV = American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value—TWA.
REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.
[f]IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

Notes continued on following page.

TABLE 3-1
CHEMICAL HAZARD INFORMATION

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 90-117, 1990).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.
LC_{50} = Lethal concentration for 50 percent of population tested.
LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1991, compiled by the American Conference of Governmental Industrial Hygienists.
Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 5th ed., 1986.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1990, No. 90-117, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschuseren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

Refer to footnotes at end of table.

4. General Safety Practices

4.1 General Practices

General safety procedures for Site activities include, but are not limited to the following:

- At least one copy of this plan must be at the project Site, in a location readily available to all personnel, and reviewed by all project personnel prior to starting work.
- Food, beverages, or tobacco products must not be present or consumed in work zones on the Site. Cosmetics must not be applied in work zones on the Site.
- Waste, debris, and used protective clothing must be properly contained and labeled.
- No one shall be on-site alone, unless having communication methods, (e.g., cell phone, scheduled call backs, etc.)

4.1.1 Emergency Equipment

Adequate emergency equipment for the activities conducted on-site and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926. Personnel will be provided with access to emergency equipment including but limited to the following:

- Portable containers with sanitary saline approved for eye washing.
- Fire extinguishers of adequate size, class, number, and location as required by applicable sections of 29 CFR 1910 and 29 CFR 1926.
- Industrial First Aid Kit of adequate size for number of personnel on-site.

4.2 Heat Stress

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat rashes are the one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much and too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst

cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat exhaustion occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat stroke is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict.

Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of work load and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should not be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

Heat Stress Safety Precautions

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in the Table 4-1.

TABLE 4-1
WORK/REST SCHEDULE

Adjusted Temperature[b]	*Work-Rest Regimen Normal Work Ensemble*[c]	*Work-Rest Regimen Impermeable Ensemble*
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°-90°F (30.8°-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°-77.5°F (30.8°-32.2°C)	After each 150 minutes of work	After each 120 minutes of work

[a] For work levels of 250 kilocalories/hour (Light-Moderate Type of Work)

[b] Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

[c] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

[d] The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

In order to determine if the work rest cycles are adequate for the personnel and specific Site conditions additional monitoring of individuals heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one-third and maintain the same rest period

Additional one or more of the following control measures can be used to help control heat stress and are mandatory if any Site worker has a heart rate (measure immediately prior to rest period) exceeding of 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-site drinking water will be kept cool (50 to 60°F) .
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Employees must not be assigned to other tasks during breaks.
- Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.
- All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

4.3 Cold Stress Hazards

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body which have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at -18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in Table 4-2.

TABLE 4-2
CHILL TEMPERATURE CHART

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute.			GREAT DANGER Flesh may freeze within 30 seconds.				
	Trench foot and immersion foot may occur at any point on this chart.											

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- ***Frost Nip or Incipient Frostbite*** - characterized by suddenly blanching or whitening of skin.
- ***Superficial Frostbite*** - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- ***Deep Frostbite*** - tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes)

rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment. To avoid cold stress, Site personnel must wear protective clothing appropriate for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

Safety Precautions for Cold Stress Prevention

- For air temperature of 0°F or less, the hands should be protected by mittens. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.

- At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.

- If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must ensure that their clothing is not wet as a consequence of sweating. If wet, field personnel must change into dry clothes prior to entering the cold area.

- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.

- Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

Safe Work Practices

- Direct contact between bare skin and cold surfaces ($\leq$ 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

- For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.

- Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing.

- Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

4.4 Noise

Exposure to noise over the OSHA action level (85 dBA) can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

Control - All personnel must wear hearing protection - with a Noise Reduction Rating (NRR) of at least 20 - when noise levels exceed 85 dBA. The treatment building is a posted hearing conservation area. When the treatment system is operating inside the treatment building hearing protection is required. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All Site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 8.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

4.5 Sanitation

Site sanitation will be maintained according to OSHA -1926.51(c)(1).

4.5.1 Break Area

Breaks must be taken away from the active work area. There will be no smoking, eating, drinking, or chewing gum or tobacco in any work area on the Site.

4.6 Electrical Hazards

Electricity may pose a particular hazard to Site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, it must be performed by a qualified electrician.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by UL, Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.
- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or United States Coast Guard regulations.
- Portable and semi portable tools and equipment must be grounded by a multiconductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.

- All circuits must be protected from overload.
- Temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension outlets must be equipped with ground fault circuit interrupters (GFCI).
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.
- Extension cords or cables must be inspected prior to each use, and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

4.7 Lockout/Tagout Procedures

Maintenance procedures will only be performed by fully qualified and trained individuals. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 and the prime contractor Lockout/Tagout Control of Hazardous Energy/Materials corporate health and safety procedures (Appendix L-1) will be followed.

Lockout is the placement of a device that uses a positive means (such as a lock) to secure an energy or material-isolating system such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system will be used. Tagout is the placement of a warning tag on an energy or material-isolating device indicating that the equipment controlled may not be operated until the tag is removed.

Equipment-specific information concerning lockout procedures is located in the operations and maintenance manual for Site equipment requiring routine maintenance. If equipment-specific procedures are not in the operations and maintenance manual for an on-site piece of equipment, procedures outlined in the prime contractor Lockout/Tagout Control of Hazardous Energy/Materials corporate health and safety procedures (Appendix L-1) will be followed.

4.8 Lifting Hazards

Back strain or injury may be prevented by using proper lifting techniques. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points which could crush or pinch them, especially when putting an object down.

- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.
- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

4.9 Biological Hazards

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, and other pests.

4.9.1 Tick-Borne Diseases

Lyme disease, erlichiosis, and Rocky Mountain Spotted Fever (RMSF) are diseases transmitted by ticks and occur throughout the United States during spring, summer, and fall.

Lyme Disease - The disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Few cases have been identified in other states.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, swelling and pain in the joints, and eventually, arthritis. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever (RMSF) - This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

Control - Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

4.9.2 Poisonous Plants

Poison ivy may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

Control - The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water, and observed for signs of reddening.

4.9.3 Snakes

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snake bites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control - To minimize the threat of snake bites and insect hazards, all personnel walking through vegetated areas must aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snake bite occurs, an attempt should be made to kill the snake for identification. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

5. Personal Protective Equipment

5.1 General

Personal protective equipment is required to safeguard Site personnel from various hazards. Varying levels of protection may be required depending on the level of contaminants and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level.

5.2 Levels of Protection

Protection levels are determined based upon contaminants present in the work area. A summary of the levels is presented in this section.

5.2.1 Level D Protection

The minimum level of protection that will be required of prime contractor personnel and subcontractors at the Site will be Level D, which will be worn in support areas. The following equipment will be used:

- Work clothing as prescribed by weather;
- Steel toe work boots, meeting ANSI Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Hard hat, meeting ANSI Z89; and
- Hearing protection (If noise levels exceed 85 dBA, then hearing protection with a US EPA NRR of at least 20 dBA must be used).

5.2.2 Modified Level D Protection

Modified Level D will be used when airborne constituents are not present at levels of concern, but Site activities are causing an increased potential for skin contact with subsurface liquids, sediments, and soil. Modified Level D consists of:

- Polyethylene-coated Tyvek® coveralls or equivalent;
- Safety-toe work boots meeting ANSI Z41;
- Latex booties over steel-toe work boots;
- Safety glasses or goggles meeting ANSI Z87;
- Hard hat meeting ANSI Z89;
- Face shield in addition to safety glasses or goggles when projectiles or splashes pose a hazard;
- Heavy nitrile (outer) gloves over Silvershield® gloves (inner); and
- Hearing protection (if necessary).

5.2.3 Level C Protection

Level C protection will be required when the airborne concentration of suspected constituents is known to Site action levels. Level C protection will be used for operations when air monitoring instruments indicate an upgrade is necessary. See Section 8.

The following equipment will be used for Level C protection:

- Full-face or half-face air-purifying respirator with organic vapor/acid gas cartridges in combination with high efficiency particulate filters (HEPA) which are NIOSH/MSHA approved;
- Polyethylene-coated Tyvek® suit or equivalent, ankles and cuffs taped to boots and gloves;

- Heavy nitrile (outer) gloves over Silvershield® gloves (inner) gloves;
- Safety toe work boots, ANSI Z41 approved;
- Chemical resistant Neoprene boots with steel toes; or disposable latex booties over safety toe shoes;
- Hard hat, ANSI Z89 approved; and
- Hearing protection (if necessary).

5.2.4 Level B Protection

Level B protection will be required when the airborne concentration of suspected chemicals is unknown or is known but exceeds the maximum use concentrations for Level C PPE.

The following equipment will be used for Level B protection:

- Positive pressure-demand, full-face piece self-contained breathing apparatus (SCBA), or positive pressure-demand supplied air respirator with escape SCBA (NIOSH approved);
- Polyethylene-coated Tyvek® coverall with attached boots or equivalent;
- Nitrile outer gloves over Silvershield® inner gloves;
- Steel toe work boots, ANSI Z41 approved;
- Chemical resistant Neoprene boots with steel toes; or latex booties over safety toe shoes;
- Hard hat, ANSI Z89 approved; and
- Hearing protection (if necessary).

5.2.5 Selection of PPE

Equipment for personal protection will be selected based on the potential for contact, Site conditions, ambient air quality, and the judgment of supervising Site personnel and HS professionals. The PPE used will be chosen to be effective against the compound(s) present on the Site.

5.3 Site Respiratory Protection Procedures

Respiratory protection is an integral part of employee health and safety at the Site due to the potential for airborne constituents.

Site respiratory protection procedures will consist of the following:

- All Site personnel who may use respiratory protection will have an assigned respirator.
- All Site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air purifying respirator within the past 12 months.
- All Site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the HSS, prior to commencement of Site work.
- Only cleaned, maintained, NIOSH/MSHA-approved respirators are to be used on this Site.
- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn on-site.

- All Site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.

- Respirators will be inspected, and a negative pressure test performed prior to each use.

- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

5.4 Using PPE

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory when Modified Level D, Level C, or B PPE is used.

All people entering the exclusion zone (EZ) must put on the required PPE in accordance with the requirements of this plan. When leaving the exclusion zone (EZ), PPE will be removed in accordance with the procedures listed, to minimize the spread of contamination.

5.4.1 Donning Procedures

These procedures are mandatory when Modified Level D or higher PPE is used on the project:

- Remove bulky outerwear. Remove street clothes and store in clean location;

- Put on work clothes or coveralls;

- Put on the required chemical protective coveralls or rain gear;

- Put on the required chemical protective boots or boot covers;

- Tape the legs of the coveralls to the boots with duct tape;

- Put on the required chemical protective gloves;

- Tape the wrists of the protective coveralls to the gloves;

- Don the required respirator (Level C or higher) and perform appropriate fit check;

- Put hood or head covering over head and respirator straps (Level C or higher) and tape hood to facepiece; and

- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, one person must remain outside the work area to ensure that each person entering has the proper protective equipment.

5.4.2 Doffing Procedures

The following procedures are mandatory when Modified Level D or higher PPE is required for this project. Whenever a person leaves a Modified Level D or higher work site, the following decontamination sequence will be followed:

- Upon entering the contamination reduction zone, rinse contaminated materials from the boots or remove contaminated boot covers;
- Clean reusable protective equipment;
- Remove protective garments, equipment, and respirator (Level C or higher). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels;
- Wash hands, face and neck or shower (if necessary);
- Proceed to clean area and dress in clean clothing; and
- Clean and disinfect respirator (Level C or higher) for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags, labeled for disposal. See Section 7 for detailed information on decontamination stations.

5.5 Selection Matrix

The level of personal protection selected will be based upon real-time air monitoring of the work environment and an assessment by the SS/HSS of the potential for skin contact with impacted materials. The PPE selection matrix is given in Table 5-1. This matrix is based on information available at the time this plan was written. The Airborne Constituent Action Levels in Table 8-1 should be used to verify the need for upgrade and downgrade of PPE.

TABLE 5-1
PPE SELECTION MATRIX

Task	Anticipated Minimum Level of Protection for Task Initiation
Site inspection, data collection, observation activities, mobilization	Level D with boots and gloves as necessary
Activities requiring handling of ground water, leachate, surface water, and sediment	Modified Level D
Leachate loading and transfer	Modified Level D
Leachate system maintenance, repair, and replacement activities	Modified Level D
Cap and fence line maintenance	Level D
Snow removal	Level D
Confined space entry activities	Modified Level D/Level C
Ground-water Sampling/Elevation Measurement Activities	Modified Level D
Equipment Cleaning/Chemical Handling	Modified Level D

6. Site Control

6.1 Authorization to Enter

All personnel who are potentially exposed to hazardous substances must have completed hazardous waste operations initial training as defined under OSHA Regulation 29 CFR 1910.120, have completed their training or refresher training within the past 12 months, and have been certified by a physician as fit for hazardous waste operations in order to enter a Site area designated as an EZ or CRZ. Personnel without such training or medical certification may enter the designated SZ only. The SS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed within the EZ or CRZ.

6.2 Site Orientation and Hazard Briefing

No person will be allowed in the general work area during Site operations without first being given a Site orientation and hazard briefing. This orientation will be presented by the HSS, and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. In addition to this meeting, Daily Safety Meetings will be held each day before work begins.

All people on the Site, including visitors, must document their attendance to this briefing as well as the Daily Safety Meetings on the forms included with this plan.

6.3 Certification Documents

A training and medical file may be established for the project and kept on site during all Site operations. The 24 or 40-hour training, update, and specialty training [first-aid/cardiopulmonary resuscitation (CPR)] certificates, as well as current medical clearance for all project field personnel, will be maintained within that file. All prime contractor and subcontractor personnel must provide their training and medical documentation to the HSS prior to the start of field work.

6.4 Entry Log

A log-in/log-out sheet will be maintained at the Site by the SS. Personnel must sign in and out on a log sheet as they enter and leave the CRZ, and the SS may document entry and exit in the field notebook.

6.5 Entry Requirements

In addition to the authorization, hazard briefing and certification requirements listed above, no person will be allowed on any prime contractor field Site unless he or she is wearing the minimum SZ PPE as described in Section 5. Personnel entering the EZ or CRZ must wear the required PPE for those locations.

6.6 Emergency Entry and Exit

People who must enter the Site on an emergency basis will be briefed of the hazards by the SS. All hazardous activities will cease in the event of an emergency and any sources of emissions will be controlled, if possible.

People exiting the Site because of an emergency will gather in a safe area for a head count. The SS is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

6.7 Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas. Contamination control zones will be established in the field and based on prevailing site and work conditions. Contamination control zones may be established during leachate handling operation, monitoring activities, or maintenance activities. Figure 1 presents a map of the various site features, including areas where contamination reduction zones may be established during site activities.

6.7.1 Exclusion Zone

The EZ consists of the specific work area, or may be the entire area of suspected contamination. All employees entering the EZ must use the required PPE, and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. The location of each exclusion zone may be identified by cones, caution tape, or other appropriate means.

6.7.2 Contamination Reduction Zone

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the SZ.

6.7.3 Support Zone

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to Site requirements.

6.7.4 Posting

Where necessary, the EZ, CRZ, and SZ will be prominently marked and delineated using cones, caution tape, or other suitable means.

6.8 Site Inspections

The Site supervisor will conduct a daily inspection of Site activities, equipment, and zone set up to verify that the required elements are in place. The inspection form in Appendix B may be used as a guide for daily inspections.

7. Decontamination

7.1 Personnel Decontamination

All personnel wearing Modified Level D or Level C protective equipment in the contaminated zone must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations.

Station 1: Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.

Station 2: Personnel will remove their outer garment and gloves and deposit them in the lined waste receptacles. Personnel will then decontaminate their hard hats, and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.

Station 3: Personnel will thoroughly wash their hands and face before leaving the decontamination zone. Respirators will be sanitized and then placed in a clean plastic ziplock bag.

The SS/HSS will verify that appropriate decontamination procedures have been performed for personnel entering the SZ after wearing Modified Level D or Level C protective equipment during site activities.

7.2 Equipment Decontamination

All vehicles that have entered the contaminated zone will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

7.3 Personal Protective Equipment Decontamination

Where and whenever possible, single use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers.

Reusable protective clothing will be rinsed at the Site with detergent and water. The rinsate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves and covers must be thoroughly cleaned at the end of each work shift, and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water, or by using a spray disinfectant.

8. Site Monitoring

8.1 Air Monitoring

Air monitoring will be conducted to evaluate airborne contaminant levels. Personal exposure monitoring may be necessary to evaluate employee exposures. The monitoring results will dictate work procedures and the selection of PPE. The monitoring devices to be used, at a minimum, are a photo ionization detector (PID). Colorimetric tubes (Drager or equivalent) shall be utilized to screen for methylene chloride and benzene. During confined space entry and excavation entry activities a combustible gas/oxygen (LEL/O_2) meter and hydrogen sulfide/carbon monoxide monitor must be utilized.

If the BBLES and one or more BBLES subcontractors are working in an area, one subcontractor may conduct direct-reading air monitoring and share the results with the other subcontractors working in the area. In this situation all subcontractors must coordinate air monitoring through a mutually-agreed upon air monitor. The prime contractor HSS will be responsible for utilizing the air monitoring results to determine appropriate health and safety precautions for prime contractor personnel only.

Monitoring for organic vapors for the purpose of estimating worker exposure level will be conducted in the breathing zone with the PID (note: an 11.7 eV probe shall be used for methylene chloride monitoring) during all field activities with the potential for organic vapor generation. At a minimum, readings will be recorded at least hourly or more frequently as determined by the HSS. Air monitoring data must be recorded on an air monitoring log (Appendix D) or in the field notebook by the HSS.

8.2 Noise Monitoring

Noise monitoring will be conducted as required to profile noise exposure on the Site. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

8.3 Monitoring Equipment Maintenance and Calibration

All direct reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments which are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the HSS and maintained by the SS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturers' procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturers' procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the HSS must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The HSS will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

8.4 Action Levels

Table 8-1 presents airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the Site.

TABLE 8-1
AIRBORNE CONTAMINANT ACTION LEVELS

Parameter	Reading	Action
Total Organic Vapors (TOV)	0 ppm to ≤ 1 ppm	Normal operations; continue hourly breathing zone monitoring
	> 1 ppm to 50 ppm	Upgrade to Level C; collect Drager Tube samples for benzene; if these constituents are not present above action levels, utilize Level C PPE
	> 12.5 ppm	Collect colorimetric tube for methylene chloride
	> 50 ppm	Stop work; evacuate area; investigate cause of reading or Upgrade to level B; determine level at downwind property boundary and Site control zone
Flammable Vapors (LEL) During confined space entry.	< 10% LEL	Normal operations
	≥ 10% LEL	Stop work; ventilate area; investigate source of vapors
Oxygen During confined space entry.	> 19.5%, < 23.5%	Acceptable Condition, Normal Operations
	< 19.5%, > 23.5%	Stop work; evacuate area; ventilate
Carbon Monoxide During confined space entry.	< 20 ppm	Normal operations
	≥ 20 ppm	Stop work; ventilate area; investigate source
Hydrogen Sulfide During confined space entry.	< 5 ppm	Normal operations
	≥ 5 ppm	Stop work; ventilate area; investigate source

Notes:

1) Readings for TOV are for two consecutive minutes, at breathing zone height, measured with a photoionization detector calibrated with isobutylene.

9. Employee Training

9.1 General

All on-site project personnel who work in areas where they may be exposed to Site constituents must be trained as required by OSHA Regulation 29 CFR 1910.120. Such field employees also receive a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their training more than 12 months prior to the start of the project must have completed an 8-hour refresher course within the past 12 months. The prime contractor SS must have completed an additional 8 hours of training for supervisors, and must have a current first-aid/CPR certificate.

9.2 Basic 40-Hour Course

The following is a list of the topics typically covered in a 40-hour training course:

- general safety procedures;
- physical hazards (fall protection, noise, heat stress, cold stress);
- names and job descriptions of key personnel responsible for Site HS;
- safety, health, and other hazards typically present at hazardous waste sites;
- use, application and limitations of PPE;
- work practices by which employees can minimize risks from hazards;
- safe use of engineering controls and equipment on site;
- medical surveillance requirements;
- recognition of symptoms and signs which might indicate overexposure to hazards;
- worker right-to-know (Hazard Communication OSHA 1910.1200);
- routes of exposure to constituents;
- engineering controls and safe work practices;
- components of a Site HS program and HASP;
- decontamination practices for personnel and equipment;
- confined-space entry procedures; and
- general emergency response procedures.

9.3 Supervisor Course

Management and supervisors receive an additional eight hours of training which typically includes:

- general Site safety and health procedures;
- PPE programs; and
- air monitoring techniques.

9.4 Site-Specific Training

Site-specific training will be accomplished by each Site worker reading this HASP, or through a Site briefing by the PM, SS, or HSS on the contents of this HASP before work begins. The review must include a discussion of the chemical, physical, and biological hazards, the protective equipment and safety procedures, and emergency procedures.

9.5 Daily Safety Meetings

Daily Safety Meetings will be held to cover the work to be accomplished, the hazards anticipated, the protective clothing and procedures required to minimize Site hazards, and emergency procedures. These meetings should be presented by the SS or HSS prior to beginning the day's field work. No work will be performed in an EZ before the Daily Safety Meeting has been held. The Daily Safety Meeting must also be held prior to new tasks, and repeated if new hazards are encountered. The Daily Safety Meeting Log is included in Appendix E.

9.6 First Aid and CPR

Employees current in first aid/CPR will be assigned to the work crew and will be on the Site during operations. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

10. Medical Surveillance

10.1 Medical Examination

All personnel who are potentially exposed to Site constituents must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

10.1.1 Preplacement Medical Examination

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable OSHA Regulations. The preplacement and periodic medical examinations typically include the following elements:

- medical and occupational history questionnaire;
- physical examination;
- complete blood count, with differential;
- liver enzyme profile;
- chest X-ray, at a frequency determined by the physician;
- pulmonary function test;
- audiogram;
- electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination;
- drug and alcohol screening, as required by job assignment;
- visual acuity; and
- follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project Site work.

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Subcontractors will supply copies of the medical examination certificate for each on-site employee.

10.1.2 Other Medical Examination

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- at employee request after known or suspected exposure to toxic or hazardous materials;
- at the discretion of the client, HS professional, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials; and

- at the discretion of the occupational physician.

10.1.3 Periodic Exam

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 18 months.

10.2 Medical Restriction

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the HSS. The terms of the restriction will be discussed with the employee and the supervisor.

11. Emergency Procedures

11.1 General

Prior to the start of operations, the work area will be evaluated for the potential for fire, constituent release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the SS/HSS immediately.

The SS/HSS will establish evacuation routes and assembly areas for the Site. All personnel entering the Site will be informed of this route and the assembly area.

Additional emergency response procedure information is presented in Section 6 of the Work Plan.

11.2 Emergency Response

If an incident occurs, the following steps will be taken:

- the SS/HSS will evaluate the incident and assess the need for assistance and/or evacuation;
- the SS/HSS will call for outside assistance as needed;
- the SS/HSS will ensure the PM is notified promptly of the incident; and
- the SS/HSS will take appropriate measures to stabilize the incident scene.

11.2.1 Fire

In the case of a fire on the Site, the SS/HSS will assess the situation and direct fire-fighting activities. A fire extinguisher is maintained in the equipment storage shed on site. The SS/HSS will ensure that the client Site representative (as appropriate) is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that Site personnel are unable to safely extinguish, the local fire department will be summoned.

11.2.2 Constituent Release

In the event of a constituent release, the following steps will be taken:

- notify SS/HSS immediately;
- evacuate immediate area of release;
- conduct air monitoring to determine needed level of PPE; and
- don required level of PPE and prepare to implement control procedures.

The SS/HSS has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

In the event of a release, the occurance will be reported to the SS/HSS, who will notify the Project Manager. The Project Manager will notify de maximis, inc., who will notify the appropriate regulatory agencies. If de maximis,

inc., who will notify the appropriate regulatory agencies, is not available, the USEPA Remedial Project Manager will be notified.

The area affected by the release will be restricted to access by only those personnel involved in its characterization or cleanup. All others will be required to maintain a safe distance from the area of the release, as determined in the field. If Site evacuation is necessary, either the east or west gate can be used, provided that egress from these locations is determined to be safe.

Site personnel will periodically review emergency procedures with subcontractors, and establish appropriate protocols for emergency response and evacuation.

11.3 Medical Emergency

All employee injuries must be promptly reported to the HSS/SS, who will:

- ensure that the injured employee receives prompt first aid and medical attention;
- in emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room); and
- EMR is to be notified by Site personnel as soon as possible after the worker has left the Site. The caller should dial 1-800-229-3674 and follow the instructions for reaching the Injury Management office. When the Case Manager answers, the caller should provide the information requested by the Case Manager.

11.3.1 First Aid - General

All persons must report any near-miss incident, accident, injury, or illness to their immediate supervisor or the SS. First aid will be provided by trained personnel. Injuries and illnesses requiring medical treatment must be documented. The SS must conduct an accident investigation as soon as emergency conditions no longer exist and first-aid and/or medical treatment has been ensured. These two reports must be completed and submitted to the PM within 24 hours after the incident.

If first-aid treatment is required, first aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured should be transported to the medical facility. If the injured is not ambulatory, or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

- ***Survey the scene.*** Determine if it is safe to proceed. Try to determine if the conditions which caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.
- ***Do a primary survey of the victim.*** Check for **airway** obstruction, **breathing**, and **pulse**. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- ***Phone Emergency Medical Services (EMS).*** Give the location, telephone number used, caller's name, what happened, number of victims, victims' condition, and help being given.
- ***Maintain airway and perform rescue breathing*** as necessary.
- ***Perform cardiopulmonary resuscitation (CPR)*** as necessary.

- ***Do a secondary survey of the victim.*** Check **vital signs** and do a **head-to-toe exam.**

- ***Treat other conditions as necessary.*** If the victim can be moved, take him to a location away from the work area where EMS can gain access.

11.3.2 First Aid - Inhalation

Any employee complaining of symptoms of chemical overexposure as described in Section 3 will be removed from the work area and transported to the designated medical facility for examination and treatment.

11.3.3 First Aid - Ingestion

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information, if recommended. If unconscious, keep the victim on his side and clear the airway if vomiting occurs.

11.3.4 First Aid - Skin Contact

Project personnel who have had skin contact with constituents will, unless the contact is severe, proceed through the decontamination zone, to the wash-up area. Personnel will remove any contaminated clothing, and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he shows any sign of skin reddening, irritation, or if he requests a medical examination.

11.3.5 First Aid - Eye Contact

Project personnel who have had constituents splashed in their eyes or who have experienced eye irritation while in the contaminated zone, must immediately proceed to the eyewash station, set up in the decontamination zone. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

11.4 Reporting Injuries and Illnesses

All injuries and illnesses, however minor, will be reported to the SS immediately. The SS will complete an Accident Investigation Report (Appendix L-6) and submit it to the PM within 24 hours.

11.5 Emergency Information

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the Daily Safety Meeting. These agencies are identified in the following table.

11.6 Emergency Medical Care

The route to the nearest hospital is Appendix G. This route should be used if it is necessary to transport personnel requiring emergency medical care to the hospital.

route not marked

site location not marked

TABLE 11-1

Health and Safety Plan
Emergency Response Contact List

Contact	Telephone Number	
Police Department:	911	
Fire Department:	911	
Ambulance:	911	
Title/Role	**Name**	**Telephone Number**
General Electric Project Manager	Michael Ianniello	(518) 862-5200
BBLES Project Manger	David R. Gerber. P.E.	(315) 446-2570

Note: See Table 2-1 of this HASP for telephone numbers of key client and prime contractor personnel associated with this project.

Appendices

APPENDIX A

CORPORATE HEALTH AND SAFETY POLICY AND PROCEDURE MANUAL

Table of Contents
Health & Safety Manual - Vol. 3

1.01 Administration

	TOPIC: POLICY	PPM# 1.01.01
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

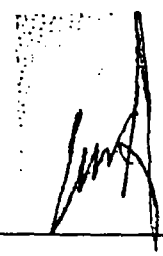
It is the policy of the Firm to provide a safe and healthful work environment for all of its employees.

A fundamental principle of safety and loss prevention is that accidents that cause personal injury or illnesses as well as property damage can be prevented. Such accident prevention is both a moral obligation and a sound business practice. In fulfilling the commitment to prevent accidents, the Firm will strive to provide and maintain a safe and healthful work environment as indicated by acceptable industry standards and compliance with legislative requirements. The Firm will strive to eliminate or control any foreseeable hazards which may result in fires, security losses, property damage/accident losses, and personal injuries and illnesses.

The active support and participation of every employee is required to achieve the best results in safety and health. To accomplish this, management and supervisory personnel must set the example and be scrupulous in their observation of good safety and health practices. Employees, in turn, are equally responsible for minimizing accidents and property losses while conducting their work activities.

We trust that each and every employee will join us in a personal commitment to accident prevention as a way of life.

- END OF PROCEDURE -

Executive Authorization: 

Date: 11/10/93

BBL	TOPIC: ORGANIZATION AND RESPONSIBILITIES	PPM# 1.01.03
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees and will abide by applicable state and federal agency regulations governing occupational health and safety. In order to effectively implement the Corporate Health and Safety Program and associated operating procedures, a corporate health and safety organizational structure for health and safety personnel has been established.

DESCRIPTION OF PROCEDURE:

1. ROLES

A. Corporate Industrial Hygiene/Environmental Safety Associate

The Corporate Industrial Hygiene/Environmental Safety Associate (CSA) administers all corporate health and safety policies, procedures and activities. The CSA reports to the Divisional Executive Vice President. The CSA in association with divisional and departmental personnel implement, maintain and enforce the corporate health and safety program. The CSA is assisted in each region by a Regional Health and Safety Coordinator and in each division by a Divisional Health and Safety Coordinator.

B. Regional Health and Safety Coordinator

The Regional Health and Safety Coordinators (RHSC) are responsible for Corporate Health and Safety program implementation and activities on a regional basis (North and Central Region, South and West Region). The RHSCs report to the CSA and serve as a liaison between the Divisional Health and Safety Coordinators and the CSA. Responsibilities include:

- Health & Safety Plan preparation, review, and approval;
- Injury investigation and case management;
- Training of internal staff;
- Technical support of projects;
- Medical Program implementation; and
- Industrial hygiene/health and safety consulting.

C. Division Health and Safety Coordinator

Division Health and Safety Coordinators (DHSC) assist in implementing health and safety programs, procedures and policies for their respective divisions, and not responsible for communicating those policies and procedures to the division staff. The DHSC coordinates health and safety training, maintains divisional health and safety records, and assists project managers in compliance with established policies and procedures. They are also responsible for the implementation of the company's hazard communication program and providing newly hired divisional personnel with safety orientation. The DHSC reports to the RHSC on health and safety matters.

D. Manager, Human Resources

The Manager, Human Resources works in cooperation with Health & Safety Division staff to ensure that specific aspects of the corporate health and safety program are fulfilled. Generally, the HR Manager assists

- Presenting the following health and safety orientation to new employees and documenting attendance on the New Employee Health & Safety Orientation Checklist:
    - General Health & Safety Rules
    - New employee health & safety orientation
    - Respiratory protection
    - Hazard Communication
    - Hearing Conservation
    - General Office Safety
- Maintaining health & safety training and fit testing documentation for the divisional employees;
- Informing the DHSC of project needs for HASP development/review/approval;
- Providing guidance regarding respirator selection and purchasing, coordinates respirator fit testing and documentation;
- Reviewing requests for prescription safety glasses, respirator inserts and safety shoes/boots and consulting with the employee's supervisor as appropriate regarding their purchase;
- Reviewing and signing accident investigation forms received from the HSS;
- Forwarding copies of accident investigation reports and associated medical clearances to the RHSC, CSA, Manager, Human Resources and Corporate Counsel within 48 hours of occurrence;
- Performing accident investigations for office accidents, or field accident investigations in support of the site HSS;
- Conducting a chemical inventory of hazardous substances used in the division location, laboratory or on divisional work sites;
- Approving the purchase of chemicals, adding them to the chemical inventory and maintaining the required MSDSs and labels for the chemical;
- Informing divisional employees of hazard communication requirements and enforcing hazard communication procedures;
- Assisting in the selection of proper hearing protectors for field use. On projects where a HSS has not been assigned, the DHSC assumes HSS responsibilities;
- Reviewing PPM 16.02.08 with trained permit-space entrants and attendants on a project-specific basis;
- Verifying that all confined space entrants and attendants have received Confined Space Entry training;
- Verifies that the project confined space entry supervisor fulfills all required responsibilities and completes an entry permit as required by 16.02.08;
- Reviewing copies of completed and canceled Confined Space Entry Permits and verifying that they are properly distributed and retained with the appropriate project files as specified in Section 11 of the Confined Space Entry PPM (Health & Safety Manual PPM 1.02.08), "Posting and Recordkeeping"; and
- Acts as HSS, if necessary.

2) Responsibilities

Health and Safety Supervisors are responsible for:

- Implementing and enforcing the site Health and Safety Plan and Corporate health and safety procedures on project sites;
- Conducting daily safety meetings and site orientations;
- Verifying that all BBL site personnel working on sites governed under 29 CFR 1910.120 are currently certified in CPR/First Aid and have received current OSHA training;
- Reviewing applicable site health and safety requirements and all components of the site-specific health and safety plan;
- Immediately reporting all accidents verbally to the RHSC, DHSC, and EMR:
- Conducting an accident investigation to determine the cause(s) of a personal injury or illness, completing the accident investigation and medical clearance forms, and forwarding the completed forms to the Corporate Safety Associate within 48 hours of the accident. All major accidents must be reported to the Corporate Safety Associate and Manager, Human Resources immediately;
- Assisting the CSA and DHSC in the development and implementation of techniques to mitigate future risk during similar operations;
- Coordinating site-specific needs with emergency response personnel and medical providers; and
- In emergency situations, assuring that the examining medical facility is adequately apprised of site conditions that caused or may have caused a medical emergency. This may include providing appropriate parties with copies of the applicable Material Safety Data Sheets (MSDS) for the chemical(s) involved.

F. Project Managers

1) Qualifications: Project managers must meet standard BBL requirements for training and experience.

2) Responsibilities

Project Managers must:

- Direct the preparation of a project Health & Safety plan is written, and approved by Division 61 prior to commencement of project activities;
- Verify that appropriate PPE is provided to project personnel;
- Verify that project personnel are properly trained;

TOPIC: NEW EMPLOYEE ORIENTATION		PPM# 1.01.04
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

This procedure sets forth the requirements for providing all new employees with an initial health and safety orientation. This applies to all new employees-temporary as well as permanent.

DESCRIPTION OF PROCEDURE:

1. RESPONSIBILITIES

   A. Officers/Division heads are responsible for assuring that all new employees receive the initial health & safety orientation within five (5) working days of starting employment.

   B. The Divisional Health & Safety Coordinator (HSC) is responsible for presenting the initial health & safety orientation. Attendance at the initial health & safety orientation must be documented in the form of the New Employee Health & Safety Orientation Checklist. A copy of the checklist must be retained in the employee's office file, and the original forwarded to Manager, Health & Safety, along with training documentation. **[A standard form follows this procedure.]**

   C. The Divisional HSC is responsible for collecting all health & safety training documentation [i.e. OSHA 24/40-hour, supervisory, refresher, respiratory protection (fit test form), and first aid/CPR training].

2. CONTENT OF ORIENTATION

   A. As a minimum, all new employees must receive the following health & safety orientation:

      1) Review of the Health & Safety Policy Statement;
      2) General Health & Safety Rules;
      3) Office Safety;
      4) Emergency (Alarm) System, Location of Fire Alarm Boxes & Building Evacuation Routes; and
      5) Fire Extinguisher Training.

   B. In addition to the training provisions, all new employees who are hired for work on Hazardous Substance Contaminated Sites (HSCS) must receive the following as a component of their health & safety orientation:

      1) An overview of all health & safety PPMs with emphasis on Organization and Responsibilities, Health & Safety Training, Medical Surveillance, Respiratory Protection, Hazard Communication, Hearing Conversation, and Confined Space Entry.

      2) Respirator fit testing. All fit test forms must be completed and returned to the Manager, Health & Safety.

[Cont'd]

STATEMENT OF POLICY:

This procedure sets forth the requirements for providing all new employees with an initial health and safety orientation. This applies to all new employees-temporary as well as permanent.

DESCRIPTION OF PROCEDURE:

1. RESPONSIBILITIES

   A. Officers/Division heads are responsible for assuring that all new employees receive the initial health & safety orientation within five (5) working days of starting employment.

   B. The Divisional Health & Safety Coordinator (HSC) is responsible for presenting the initial health & safety orientation. Attendance at the initial health & safety orientation must be documented in the form of the New Employee Health & Safety Orientation Checklist. A copy of the checklist must be retained in the employee's office file, and the original forwarded to Manager, Health & Safety, along with training documentation. **[A standard form follows this procedure.]**

   C. The Divisional HSC is responsible for collecting all health & safety training documentation [i.e. OSHA 24/40-hour, supervisory, refresher, respiratory protection (fit test form), and first aid/CPR training].

2. CONTENT OF ORIENTATION

   A. As a minimum, all new employees must receive the following health & safety orientation:

      1) Review of the Health & Safety Policy Statement;
      2) General Health & Safety Rules;
      3) Office Safety;
      4) Emergency (Alarm) System, Location of Fire Alarm Boxes & Building Evacuation Routes; and
      5) Fire Extinguisher Training.

   B. In addition to the training provisions, all new employees who are hired for work on Hazardous Substance Contaminated Sites (HSCS) must receive the following as a component of their health & safety orientation:

      1) An overview of all health & safety PPMs with emphasis on Organization and Responsibilities, Health & Safety Training, Medical Surveillance, Respiratory Protection, Hazard Communication, Hearing Conversation, and Confined Space Entry.

      2) Respirator fit testing. All fit test forms must be completed and returned to the Manager, Health & Safety.

[Cont'd]

NEW EMPLOYEE HEALTH & SAFETY ORIENTATION CHECKLIST

Employee: _____
First Name Middle Initial Last Name

Employee No. _____ Division _____ Office _____

Job Title _____ Social Security No. _____

FIELD & NON-FIELD STAFF

- ☐ Health & Safety Policy Statement
- ☐ General Health & Safety Rules
- ☐ Office Safety
- ☐ Emergency (Alarm) System, Location of Fire Alarm Boxes and Building Evacuation Routes
- ☐ Fire Extinguisher Training
- ☐ Other (describe): _____

FIELD STAFF

- ☐ Organization and Responsibilities
- ☐ Health & Safety Training
- ☐ Medical Surveillance
- ☐ Health & Safety Plan Development and Review
- ☐ Respiratory Protection
- ☐ Hazard Communication
- ☐ Confined Space Entry
- ☐ Motor Vehicle Safety
- ☐ Issue Health & Safety Guidance Manual
- ☐ Collect Prior Health & Safety Training Certifications
- ☐ Complete Field Training Acknowledgment Form
- ☐ Respirator Fit Test Form
- ☐ Other (describe): _____

_____
Employee Signature Date

_____
Instructor Signature Date

Return Original to Manager, Health & Safety

STATEMENT OF POLICY:

This procedure sets forth the assignment of responsibility for ensuring that the necessary health and safety training, including the various categories of training required for all employees, is fulfilled. Copies of all health & safety training documentation must be furnished to the Manager, Health & Safety immediately upon hiring a new staff member and/or as such training is completed after employment. Such documentation includes, but is not limited to, OSHA 24/40-hour, supervisory, refresher, the Field Training Acknowledgment Form, respiratory protection, and first aid/CPR training.
All employees will be required to sign-in for each in-house health and safety training program attended.

DESCRIPTION OF PROCEDURE:

1. RESPONSIBILITIES

   A. Officers/Division heads are responsible for assuring that employees either possess or receive the appropriate training prior to assuming the duties for which the training is required.

   B. The Divisional Health & Safety Coordinator (HSC) is responsible for presenting the following in-house training to all divisional employees:

      1) General Health & Safety Rules;
      2) New Employee Health & Safety Orientation;
      3) Respiratory Protection (field staff) including fit-testing;
      4) Hazard Communication;
      5) Hearing Conservation; and
      6) Office Safety.

   C. The Divisional HSC is responsible for documenting attendance at the above training program in the form of a sign-in sheet. A copy of the sign-in sheet must be retained in the employees' office file, and the original sign-in sheet forwarded to the Manager, Human Resources. **[Copy of sign-in sheet follows this procedure.]**

   D. Respirator fit testing must be performed on employees and fit test forms must be completed and returned to Manager, Health & Safety.

2. HAZARDOUS SUBSTANCE CONTAMINATED SITE (HSCS) OPERATIONS

   A. Basic Training Requirements

      1) All field employees must receive the appropriate combination of off-site as well as on-site training before working on any HSCS. The training is required by the Occupational Safety & Health Administration (OSHA) in 29 CFR 1910.120-Hazardous Waste Operations and Emergency Response (HAZWOPER) for all employees engaged in or supervising those engaged in the following:

[Cont'd]

DESCRIPTION OF PROCEDURE: [Cont'd]

B. Management & Supervisory Training

1) In order to qualify as a Site Health & Safety Supervisor (HSS), and/or to manage or supervise on-site activities and employees, the individual must have completed the requisite 40-hour training program (# B2 above), and have attended an additional 8-hour off-site management/supervisory training program. The additional management/supervisory training program must include the following topics:

a) The Firm's health and safety policies and procedures;
b) Site health & safety plan development and management;
c) Calculation of doses and action levels;
d) Selection and use of personal protective equipment (PPE);
e) Hazard evaluation and risk assessment;
f) Selection, use, and care of monitoring equipment;
g) Accident causation and prevention; and
h) Accident investigation.

C. Refresher Training

1) Each employee who has received the 24/40-hour training as well as those certified as having equivalent training must attend an 8-hour refresher training program at least annually. As a minimum, refresher training must include the following topics:

a) Hazard review;
b) Review of the use and care of PPE;
c) Requirements for, use of, and proper care of respiratory protective equipment; and,
d) Selected topics such as actual field experiences, accident review, health & safety task analysis, etc.

2) No employee is permitted to perform field activities unless their training is current.

D. First Aid/CPR Training

1) Employees working on HSCS, subject to 29 CFR 1910.120, and in particular, the site HSS, should have current first aid/CPR training.

2) First aid training requires updating every 3-years while CPR must be updated annually. Training in first aid and CPR will be done by American Red Cross qualified instructors or an equivalent program.

3) All first aid/CPR training programs will be coordinated by the existing Divisional Medical Program Coordinators (MPC).

[Cont'd]

8-HOUR OSHA SUPERVISORY/REFRESHER SIGN-IN SHEET

Date

Name	Signature	Social Security No.	Division	Office

FIELD TRAINING ACKNOWLEDGEMENT FORM

As per the requirements of OSHA 1910.120, Paragraph (e) Training, on-the-job field training was provided for the duration of ☐ 8 hours ☐ 24 hours (check one) while engaged in actual on-site activities. The training consisted of the following:

- ☐ Site-Specific Health & Safety Plan
- ☐ Donning/Doffing Personal Protective Equipment
- ☐ Use of Respiratory Protective Equipment
- ☐ Chemical/Physical Hazard Recognition and Avoidance
- ☐ Site Control
- ☐ Decontamination Protocol
- ☐ Injury/Illness Reporting
- ☐ Health & Safety Reporting Relationships
- ☐ Emergency/Contingency Planning
- ☐ Spill Control & Response
- ☐ Confined Space Entry (where applicable)
- ☐ Other (describe): _____

_____

_____

8 List Site Name(s) and Dates:

_____

_____

_____

_____

_____

_____

_____

Employee Signature Date

_____

Trainer Signature and/or Employer's Name Who Provided the Field Training Date

10/28/93
6093222H

STATEMENT OF POLICY:

This procedure details the necessary provisions for administering and coordinating the medical surveillance program. Also provided are guidelines for identifying the employee population to be included in the medical surveillance program.

Environmental Medicine Resources, Inc. (EMR) is identified as the management consulting group for our medical surveillance program. As such, EMR has the responsibility to establish the examination protocol, occupational and medical history questionnaires, and negotiate with and establish quality clinics for administering the medical examination.

Only the procedures, medical clinics, and protocols established by EMR and contractually agreed to by the Firm will be utilized in the medical surveillance program. No additional medical examinations, clinics, protocols, etc., for the purpose of fulfilling the requirements of the medical provisions outlined in the Occupational Safety and Health Administration (OSHA), 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER) are permitted unless necessary to meet site-specific conditions. Such conditions must first be discussed with the Manager, Health & Safety.

The medical surveillance program applies to employees working on Hazardous Substance Contaminated Sites (HSCS), and includes pre-placement, annual or periodic, site specific biological monitoring, emergency medical care, and termination examinations.

DESCRIPTION OF PROCEDURE:

1. Employee Population

   A. All employees who will be performing activities on any HSCS must be included in the medical surveillance program, and have the appropriate medical clearances prior to performing any field activity on a HSCS.

   B. Any employee not having the appropriate medical clearances, are not permitted to enter an Exclusion Zone (EZ) or Contaminant Reduction Zone (CRZ) on any HSCS. Employees not having the appropriate medical clearances may, however, enter the Support Zone of a HSCS unless otherwise prohibited by the client.

2. Responsibilities

   A. Division heads/supervisors have the following responsibilities:

      1) Ensure that their Divisional employees have the proper medical clearances prior to assuming the duties for which the clearance is required.

      2) Ensure that an individual employee does not exceed, or is subjected to, a condition which would comprise any medical restriction identified by the medical surveillance program.

[Cont'd]

DESCRIPTION OF PROCEDURE: [Cont'd]

5) Issue medical/respiratory clearance cards to medically cleared employees.

6) Review and reconcile the medical invoices received from EMR.

E. The Manager, Human Resources has the following responsibilities in the medical surveillance program:

1) Ensuring that pre-placement medical examinations are performed on all prospective field staff prior to employment, and that successful passage of the examination is a condition of employment.

2) Review the Conditional Clearance received from EMR on all prospective employees, and notify the hiring office of the conditional results.

3) In the event of a medical restriction which precludes an existing employee from conducting additional field work, communicate to the employee's supervisor the recommended course of action.

4) Notify the MPC that a medical program participant is either terminating employment and/or is being reassigned to a new job activity which no longer requires medical program participation.

3. Pre-Placement and Periodic Medical Examinations

A. Medical examinations for both new hires (pre-placement) and existing employees (periodic and termination) as well as any necessary follow-up examinations will be scheduled by the Divisional MPC. Scheduling, authorization, notification, and re-scheduling any necessary follow-up examinations must follow the protocol established by EMR and communicated during the initial training program.

B. Periodic examinations must be scheduled and completed prior to the anniversary of the annual due date.

4. Site Specific Biological Parameters

A. Any additional biological monitoring, (i.e. blood leads, serum PCBs, cholinesterase, etc.) for the purpose of determining body burden both before and after site activity must be included in the site specific Health & Safety Plan (HASP).

B. Collection of biological specimens must be performed by the same medical provider established by EMR for the pre-placement and periodic examination. For remote job sites, and/or when other circumstances mandate an alternate clinic, the use of the alternate clinic must be discussed with the Manager, Health & Safety. The Manager, Health & Safety will coordinate the collection and subsequent analysis of the specimen with the MPC and EMR.

DESCRIPTION OF PROCEDURE: [Cont'd]

8. MEDICAL SUMMARY REPORTS/CLEARANCE CARDS

A. A Medical Summary will be provided directly to the MPC by EMR. The MPC must provide the original Medical Summary to the employee's immediate manager/supervisor. The manager/supervisor and the employee must jointly review the Medical Summary, and acknowledge that the Medical Summary has been reviewed by signing the back of the summary letter.

B. The MPC should retain a copy of the signed Medical Summary in the employee's home office. The original signed Medical Summary must be forwarded to the Manager, Health & Safety. The Manager, Health & Safety will enter the summary information into the Corporate Medical Surveillance Tracking System, and forward the signed Medical Summary to the Manager, Human Resources.

C. Information from the Medical Summary, including medical and respiratory clearances and any medical restrictions, will be recorded on a wallet-sized Medical Clearance card and issued to the employee. The wallet-sized medical/respiratory clearance card will be updated and re-issued on an annual basis as the periodic examination is administered.

D. All employees in the medical program are <u>required</u> to carry the wallet-sized medical/respiratory clearance cards on their person whenever on a site which requires medical clearance. Expired clearance cards will require that the employee be requested to leave the site and not re-enter until proper medical clearance is re-issued.

8. <u>Medical Records</u>

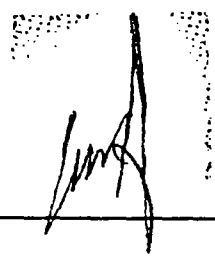
A. Comprehensive medical records will be maintained by EMR in compliance with the Occupational Safety and Health Act (OSHA) 29 CFR 1910.20 Access To Employee Exposure And Medical Records.

B. Employees may obtain a copy and/or release of their complete medical record by requesting a Release Form from the MPC and forwarding the signed release form to EMR.

C. The Medical Summary must be retained by the MPC for the period of one year, and/or discarded when replaced by a more current Medical Summary.

D. The Medical Summary will be retained by Human Resources for duration of employment, plus 30-years.

- END OF PROCEDURE -

Executive Authorization: 

Date: 11/10/93

MEMORANDUM

To: EMPLOYEE NAME **Date:** 10/12/92

From: PROGRAM COORDINATOR **File No:**

Re: Exit Medical Examination **cc:** M. B. Evans

[SAMPLE]

Please be advised that your last company sponsored medical examination was provided on ____DATE____. As a component of Blasland, Bouck & Lee's (BB&L) Medical Surveillance Program, an exit medical examination is being offered to each medical program participant who has not had an examination within the last six months. Offering this exit medical examination is a regulatory requirement specified in 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER).

The purpose of this letter is to inform you of our legal obligation to provide this exit examination. You are encouraged to participate in this component of our medical program, and are being requested to contact me for scheduling the exit examination. The exit examination should be scheduled prior to your last day at BB&L.

Please acknowledge your intentions regarding your participation in this component of our Medical Surveillance Program by checking the appropriate line and signing below. Please return the signed statement to me as soon as possible.

Thank you for your continued cooperation.

____ I elect to participate in the exit medical examination protocol being offered as a component of BB&L's Medical Surveillance Program. I will notify the Division Program Coordinator for scheduling the exit medical examination.

____ I have been informed of the necessity for and legal obligation of BB&L to provide me an exit medical examination. I elect not to participate in the exit medical examination protocol being offered as a component of BB&L's Medical Surveillance Program.

Signed: _____

Date: _____

BBL	TOPIC: HEALTH & SAFETY PLANS	PPM# 1.01.07
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

The purpose of this procedure is to establish standard requirements for the development, approval, and implementation of project-specific health and safety plans. Specific requirements include:

- All field projects subject to potential hazardous conditions require a health and safety plan.
- Health and safety plans must be prepared using the standard BBL format.
- Health and Safety Plans must be consistent with project work plans.
- All health and safety plans and addenda require the approval of a Division 61 Health and Safety professional and the Project Manager.

DESCRIPTION OF PROCEDURE:

Definitions:

Health and Safety Plan (HASP)
The name of choice for the project document that assesses project-specific hazards and prescribes appropriate control measures, including assignment of safety management responsibilities. Also known by other names such as site safety plan, safety health and emergency response plan, project safety plan, etc.

PPE
This abbreviation stands for personal protective equipment.

PSE
This abbreviation stands for Process Safety Management.

1. Requirement for Health and Safety Plan

All field projects with potential exposure to safety hazards, health hazards, or hazardous substances require the development, approval, and implementation of a project-specific HASP. It is the responsibility of the project manager on a project to obtain the HASP, with all required approvals, prior to commencement of field operations. The PM must also require that all project personnel read, understand, and sign the HASP. A site-specific training session may be presented in lieu of each person reading the HASP separately.

2. HASP Preparation

All BBL HASPs shall follow the standard format, unless the client requires a specific format which complies with applicable regulations and is at least as comprehensive in scope as the BBL format. HASPS may be drafted by operating staff personnel provided this standard format is used. A HASP which must deviate from standard format must be written by a Health & Safety Division staff member.

A. **Process Safety Management (PSM)** - BBL employees will periodically enter areas of client facilities which are regulated under the PSM standard. In this situation, specific client-driven health

Health and Safety Plans require specific approvals as described below. Note that all plans require the approval of a Health & Safety Division professional.

CATEGORY	APPROVALS
Level A or B PPE, IDLH, variance from BBL procedures, special circumstances	**Project Manager** **Regional HS Coordinator** **Corporate Industrial Hygiene/Env. Safety Associate**
Level C or D PPE	**Project Manager** **Project/Location HS Staff** **Regional HS Coordinator/other Division 61 staff**

Note that all Level A and B PPE HASPs shall be reviewed and approved by the Corporate Industrial Hygiene/Environmental Safety Associate.

5. Review of HASP by Project Staff

All project HASPs must be provided to project staff and subcontractors early enough to allow sufficient time to read and sign the HASP. New site personnel shall be given a copy of the HASP and shall be required to read and sign the HASP prior to being granted site access. Attendance at a site-specific H&S training session which covers the contents of the HASP may be substituted for reading the HASP.

6. HASP Review and Amendment

All project HASPs shall be reviewed and revised whenever work conditions change or a new task is added. To verify that the HASP is consistent with site activities, it should be reviewed periodically during the project. A formal review should take place every six months for ongoing projects. Whenever the plan must be modified to fit current site conditions, these changes shall be made as an amendment to the HASP. The original text shall not be deleted, but can be lined through to indicate that it is no longer applicable.

All site personnel shall receive a briefing on the amended HASP, and general refresher information on the unchanged provisions of the HASP.

All HASP amendments shall be subject to the same review and approval requirements as the original HASP.

7. Subcontractor HASPs

Subcontractors may work under a BBL HASP or may write their own task-specific HASPs. All subcontractor HASPs shall be reviewed by the Project Manager and the Health & Safety Division member

STATEMENT OF POLICY:

Substance abuse in the workplace impairs work productivity and morale, and can pose a serious risk of injury to people and damage to property. In order to minimize these deleterious effects, it is the policy of this Firm to maintain a drug-free workplace, and to prohibit the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance at the Firm's workplaces. This provision applies to employees while at their workplace(s), and while conducting Firm business, whatever the location. A "workplace," for purposes of this PPM, refers to wherever work is performed by an employee on behalf of the Firm, and includes both the office and any remote field site.

The use, sale, transfer or possession of alcohol or illicit drugs in or at any workplace, is prohibited, except that the use and possession of alcohol is permitted at certain social Firm functions with the prior approval of an appropriate Vice President or Executive Vice President, or the President.

No employee will be permitted to remain at a workplace when performance is affected by alcohol, illicit drugs, or other controlled substances.

Violation of this policy may result in disciplinary action, up to and including discharge.

DESCRIPTION OF PROCEDURE:

1. As a condition to employment, or of continuing employment, as the case may be, and in accordance with the requirements of the Drug-Free Workplace Act of 1988, all employees are to provide written notice to the Firm's Manager of Human Resources, of any criminal substance abuse conviction for a violation occurring in the workplace. This notice is to be given no later than five days after such a conviction. In the event of the absence or other unavailability of the Manager of Human Resources, notification should be made to the General Counsel of the Firm.

2. If the employee has been working on any government contracts, the recipient of any such notification will along with the appropriate project manager, promptly advise the government representatives for such contracts, of the situation.

3. In addition, such recipient will promptly, after consultation with the employee, the employee's supervisor, and other appropriate personnel of the Firm:

   A. Take appropriate action concerning the employee, up to and including substance abuse testing and/or termination; and/or

   B. Require the employee to participate satisfactorily in a substance abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency.

4. In furtherance of this policy, each employee will be asked to sign a statement containing substantially the language found in the attached Exhibit "A". Employment applicants will be required to sign the statement as a condition to an offer of employment.

5. A copy of this policy is to be given to each employee who is engaged in the performance of a contract which contains a provision requiring the Firm to maintain a drug-free workplace.

[Cont'd]

BBL	TOPIC: ACCIDENT REPORTING, INVESTIGATION, AND ANALYSIS	PPM# 1.01.09
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

It's the policy of the Firm to provide a safe and healthful work environment for its employees. In the unlikely event of an accident it is essential for timely reporting, investigation, and analysis to occur in order to protect employees from future injuries and illness. Accident reporting, investigation, and analysis assists the Firm with the implementation of a proactive accident prevention and loss control program. This procedure details the necessary provisions for reporting accidents and recording investigation and analysis results. All employees of the Firm who witness or are involved in an occupational accident are required to report the accident as outlined in this procedure.

DESCRIPTION OF PROCEDURE:

1. OFFICERS/DIVISION HEADS

A. Enforce all provisions of this Policy & Procedure.

2. CORPORATE INDUSTRIAL HYGIENE/ENVIRONMENTAL SAFETY ASSOCIATE (CSA)

A. Immediately conduct an accident investigation for any reported major accident.
B. Immediately report major accident status to Principals of the Firm and the Legal Division.
C. Review and maintain records of all accident investigation reports received from Regional Health and Safety Coordinators (RHSC).
D. Record and maintain injury and illness data for the Firm.
E. Review and coordinate involvement of the Firm's occupational physician during injury follow-up

3. REGIONAL HEALTH AND SAFETY COORDINATOR (RHSC)

A. Participate in accident investigation and analysis for regional personnel.
B. Provide training on accident investigation and analysis.
C. Coordinate with CSA, notification of proper authorities as required for a major accident.
D. Review and maintain records of all accident investigation reports received from Divisional Health & Safety Coordinators (DHSC) and Health & Safety Supervisors (HSS).
E. Develop corrective measures to prevent future accidents.
F. Annually review all accident investigation reports, to assist in safety program development and revision.

4. DIVISION HEALTH AND SAFETY COORDINATORS (DHSC)

A. Review and sign all accident investigation reports received from the HSS.
B. Immediately notify by phone the RHSC, project manager, CSA, and Human Resources in the event of an accident, an incident, a motor vehicle accident, or a major accident as defined in this procedure.
C. Forward copies of all accident investigation reports and medical clearance to the RHSC, CSA, Project Manager, Human Resources, and the Legal Division within 48 hours of occurrence.
D. Coordinate and participate in accident investigation and analysis for accidents and incidents involving divisional personnel.

8. EMPLOYEES

A. Immediately report all accidents to the HSS, project manager, or DHSC as appropriate.
B. Notify HSS or DHSC if unsafe condition(s) exist.
C. Implement corrective action(s) to prevent future accidents.

9. TRAINING

A. All employees will be trained concerning accident reporting through the distribution and review of this Policy & Procedure.
B. All employees will be trained, as needed, regarding their responsibilities within this procedure.
C. HSS and DHSC will receive additional training concerning accident investigation methods.
D. Training will be provided as needed to keep employees informed of changes in this procedure.

10. RECORDKEEPING

A. Accident investigation reports will be jointly maintained by the CSA and Manager, Human Resources for annual review.
B. Accident investigation reports and injury data will be maintained for five years after the year of occurrence.

- END OF PROCEDURE -

Executive Authorization: _____ **Date:** 10/10/96

STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees and will abide by applicable state and federal agency regulations governing occupational health and safety. In order to effectively implement the Corporate Health and Safety Program and associated operating procedures, a corporate health and safety organizational structure for health and safety personnel has been established.

DESCRIPTION OF PROCEDURE:

1. ROLES

A. Corporate Industrial Hygiene/Environmental Safety Associate

The Corporate Industrial Hygiene/Environmental Safety Associate (CSA) administers all corporate health and safety policies, procedures and activities. The CSA reports to the Divisional Executive Vice President. The CSA in association with divisional and departmental personnel implement, maintain and enforce the corporate health and safety program. The CSA is assisted in each region by a Regional Health and Safety Coordinator and in each division by a Divisional Health and Safety Coordinator.

B. Regional Health and Safety Coordinator

The Regional Health and Safety Coordinators (RHSC) are responsible for Corporate Health and Safety program implementation and activities on a regional basis (North and Central Region, South and West Region). The RHSCs report to the CSA and serve as a liaison between the Divisional Health and Safety Coordinators and the CSA. Responsibilities include:

- Health & Safety Plan preparation, review, and approval;
- Injury investigation and case management;
- Training of internal staff;
- Technical support of projects;
- Medical Program implementation; and
- Industrial hygiene/health and safety consulting.

C. Division Health and Safety Coordinator

Division Health and Safety Coordinators (DHSC) assist in implementing health and safety programs, procedures and policies for their respective divisions, and not responsible for communicating those policies and procedures to the division staff. The DHSC coordinates health and safety training, maintains divisional health and safety records, and assists project managers in compliance with established policies and procedures. They are also responsible for the implementation of the company's hazard communication program and providing newly hired divisional personnel with safety orientation. The DHSC reports to the RHSC on health and safety matters.

D. Manager, Human Resources

The Manager, Human Resources works in cooperation with Health & Safety Division staff to ensure that specific aspects of the corporate health and safety program are fulfilled. Generally, the HR Manager assists

- Presenting the following health and safety orientation to new employees and documenting attendance on the New Employee Health & Safety Orientation Checklist:
    - General Health & Safety Rules
    - New employee health & safety orientation
    - Respiratory protection
    - Hazard Communication
    - Hearing Conservation
    - General Office Safety
- Maintaining health & safety training and fit testing documentation for the divisional employees;
- Informing the DHSC of project needs for HASP development/review/approval;
- Providing guidance regarding respirator selection and purchasing, coordinates respirator fit testing and documentation;
- Reviewing requests for prescription safety glasses, respirator inserts and safety shoes/boots and consulting with the employee's supervisor as appropriate regarding their purchase;
- Reviewing and signing accident investigation forms received from the HSS;
- Forwarding copies of accident investigation reports and associated medical clearances to the RHSC, CSA, Manager, Human Resources and Corporate Counsel within 48 hours of occurrence;
- Performing accident investigations for office accidents, or field accident investigations in support of the site HSS;
- Conducting a chemical inventory of hazardous substances used in the division location, laboratory or on divisional work sites;
- Approving the purchase of chemicals, adding them to the chemical inventory and maintaining the required MSDSs and labels for the chemical;
- Informing divisional employees of hazard communication requirements and enforcing hazard communication procedures;
- Assisting in the selection of proper hearing protectors for field use. On projects where a HSS has not been assigned, the DHSC assumes HSS responsibilities;
- Reviewing PPM 16.02.08 with trained permit-space entrants and attendants on a project-specific basis;
- Verifying that all confined space entrants and attendants have received Confined Space Entry training;
- Verifies that the project confined space entry supervisor fulfills all required responsibilities and completes an entry permit as required by 16.02.08;
- Reviewing copies of completed and canceled Confined Space Entry Permits and verifying that they are properly distributed and retained with the appropriate project files as specified in Section 11 of the Confined Space Entry PPM (Health & Safety Manual PPM 1.02.08), "Posting and Recordkeeping"; and
- Acts as HSS, if necessary.

2) Responsibilities

Health and Safety Supervisors are responsible for:

- Implementing and enforcing the site Health and Safety Plan and Corporate health and safety procedures on project sites;
- Conducting daily safety meetings and site orientations;
- Verifying that all BBL site personnel working on sites governed under 29 CFR 1910.120 are currently certified in CPR/First Aid and have received current OSHA training;
- Reviewing applicable site health and safety requirements and all components of the site-specific health and safety plan;
- Immediately reporting all accidents verbally to the RHSC, DHSC, and EMR:
- Conducting an accident investigation to determine the cause(s) of a personal injury or illness, completing the accident investigation and medical clearance forms, and forwarding the completed forms to the Corporate Safety Associate within 48 hours of the accident. All major accidents must be reported to the Corporate Safety Associate and Manager, Human Resources immediately;
- Assisting the CSA and DHSC in the development and implementation of techniques to mitigate future risk during similar operations;
- Coordinating site-specific needs with emergency response personnel and medical providers; and
- In emergency situations, assuring that the examining medical facility is adequately apprised of site conditions that caused or may have caused a medical emergency. This may include providing appropriate parties with copies of the applicable Material Safety Data Sheets (MSDS) for the chemical(s) involved.

F. Project Managers

1) Qualifications: Project managers must meet standard BBL requirements for training and experience.

2) Responsibilities

Project Managers must:

- Direct the preparation of a project Health & Safety plan is written, and approved by Division 61 prior to commencement of project activities;
- Verify that appropriate PPE is provided to project personnel;
- Verify that project personnel are properly trained;

1.02 Loss Prevention

STATEMENT OF POLICY:

This procedure contains the necessary instructions for the selection, use, and care of respiratory protective equipment (respirators), including both air purifying (e.g., chemical cartridge, gas mask, dust/mist) and air-supplied (e.g. self-contained breathing apparatus (SCBA) and airline respirators). This applies to all employees who use respirators.

DESCRIPTION OF PROCEDURE:

1. Medical Clearance

   A. Prior to issuing a respirator, a determination must be made by Environmental Medicine Resources (EMR) of each individual's physical condition and ability to don such equipment. Only those employees who have received medical clearance from EMR may be issued a respirator.

   B. Medical recertification must be performed at least annually.

   C. Records of medical certification and recertification must be retained by Human Resources.

2. Selection

   A. Employees must use only respirators selected, supplied, and/or approved by the Firm. The Divisional Health & Safety Coordinator (HSC) has the responsibility to ensure that the proper respirator is selected and purchased.

   B. Air purifying respirators must be full-face piece, *dual* cartridge respirators.

   C. Respirators must have a NIOSH/MSHA approval.

   D. Respirator cartridge selection must be based on the site-specific hazards anticipated project-by-project as identified in the site specific Health & Safety Plan (HASP). The following points must be considered when selecting air purifying cartridges or canisters:

      1) The potential for a contaminant(s) to be present in concentrations which present an immediate danger to life and health (IDLH) and/or an oxygen deficient atmosphere;

      2) The nature of the air contaminant (e.g. gas, vapor, or particulate);

      3) The anticipated contaminant concentration;

      4) The odor characteristics, including odor threshold;

      5) Irritant properties;

      6) The Occupational Safety and Health Administration, Permissible Exposure Limit (OSHA, PEL), The American Conference of Governmental Industrial Hygienist, Threshold Limit Value (ACGIH, TLV), and/or the National Institute for Occupational Safety and Health, Recommended Exposure Limit (NIOSH, REL); and

[Cont'd]

DESCRIPTION OF PROCEDURE: [Cont'd]

D. No attempt must be made to make adjustments or repairs beyond the respirator manufacturers' recommendation.

E. Respirator users must vacate the contaminated area immediately upon notice of physical symptoms, such as nausea, dizziness, odor breakthrough or any other condition, which indicates respirator failure.

F. Respirators cartridges must be discarded and replaced whenever damaged, defective, dirty, odor is detected, or at least daily.

G. Airline respirator users must be equipped with an escape SCBA of at least five minute's duration at all times.

6. Maintenance

A. Respirators must be inspected by the user both before and after each use, for defects in the facepiece, headbands, and cartridge retaining mechanism.

B. Respirators must be cleaned and disinfected by the user after each use. Following cleaning and disinfecting, the respirator must be reinspected and placed in a plastic bag or sanitary container for storage.

C. After each use of a SCBA, the user is responsible for arranging to have the unit(s) serviced and cylinder fully recharged.

D. All SCBA and airline equipment must be inspected and maintained for use on a monthly basis.

7. Storage

A. Respirators must be stored so as to protect against dust, sunlight, extreme heat and cold, excessive moisture, and damaging chemicals.

B. Respirators must be packed and stored so that the facepiece and exhalation valve will retain a normal position and function.

C. Unused filters and cartridges must be stored in a contaminant-free environment.

8. Limitations

A. The following restrictions apply to the use of all respirators:

1) Employees must use only those respirators for which he/she has been properly fit tested.

2) Employees must not enter an atmosphere that is known or suspected to be dangerous without wearing the appropriate respiratory protection.

[Cont'd]

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

QUALITATIVE RESPIRATOR FIT TEST RECORD

Employee Name _____

Office _____ Division _____ Employee No. _____

Social Security No. _____ Title _____

Spect Kit Required? ☐ Yes ☐ No Clean Shaven? ☐ Yes ☐ No

Have you had in the past, or do you currently have any respiratory problems? ☐ Yes ☐ No

If Yes, explain _____

Have you received respiratory clearance from EMR within the last 12 months? ☐ Yes ☐ No

Provide an estimate of respirator usage during the last 12 months _____

	Respirator Information			
Type of Respirator	Full Facepiece	Full Facepiece	Full Facepiece	Full Facepiece
Manufacturer	MSA	AO	North	
Model	Ultra-Twin	OMNI Star 53002	76008A	
Cartridge	GMC-H	R53HE	N7500-83	
Size	S, M, L	One Size	One Size	

	Fit Test Information			
Atmosphere Testing	Test 1	Test 2	Test 3	Test 4
Isoamyl Acetate	Pass/Fail	Pass/Fail	Pass/Fail	Pass/Fail
Atmosphere	Pass/Fail	Pass/Fail	Pass/Fail	Pass/Fail
Recognized	Pass/Fail	Pass/Fail	Pass/Fail	Pass/Fail
Irritant Smoke				
Comments				

I certify that I have been trained in the use of respirators and fit tested with the respirator(s) listed above. I have also had the opportunity to ask questions and that those questions have been answered to my satisfaction. I understand that the above qualitative fit test is voided if the respirator is worn when conditions prevent a good face seal, i.e., facial hair, or if the respirator or limitations are not followed.

_____

Employee Signature Date

The above information is true to the best of my knowledge

_____

Instructor Signature Date

A Prescription Eye Protection

The Firm will provide prescription safety glasses (meeting ANSI Standard Z87.1) for field/lab personnel, and computer glasses for computer users, as required by their individual vision status and job. The employee is responsible to provide a copy of a current (less than 1-year old) prescription. Glasses will be replaced by the Firm as needed, usually every two years unless damaged on-the-job, or the employee exhibits a significant change of prescription.

Lenses shall be clear, special tints or dark lenses can be obtained for special applications (e.g., extended outdoor work) with prior written approval from the Health and Safety Division and the employee's Division head.

Employees requiring corrective lenses inside of respirator face pieces will be provided with safety lenses and frames sized for respirators and the respirator insert, in addition to conventional prescription safety glasses.

Employees will arrange for the eye examination through the company-provided vision care program. The employee will be responsible for providing a copy of his/her prescription that is less than one (1) year old. The company will pay for fitting services and the safety glasses.

The Firm has established discount services with several eyewear providers. Employees should contact their Divisional Health and Safety Coordinator prior to purchasing prescription safety eyeglasses. Employees will be reimbursed up to $70 for safety glasses after the Divisional Health and Safety Coordinator has verified the glasses meet the ANSI Standard requirements. Reimbursement will be handled as a non-billable cash expense under account # 633.53.

2 Foot Protection

Basic foot protection is required for all BBL job sites and industrial locations. Specialized footwear will be provided as required by the nature of the work. Special foot protection may include, but is not limited to, chemically resistant, thermally shielded, metatarsal guards, etc.

A Leather Safety Boots

For full-time field employees and maintenance employees, one pair of leather safety boots will be provided every year by the Firm. For part-time field employees, one pair of leather safety boots will be provided every two years by the Firm. The employee purchasing the footwear is required to ensure that it meets ANSI Standard Z41.

The maximum expenditure or reimbursement for approved safety shoe purchases will be $80. Reimbursement will be handled as a non-billable cash expense under account # 633.53. Reimbursement requests must be approved by the employee's Division, and after the Health and Safety Staff has verified that the shoes meet ANSI requirements.

Athletic-style safety shoes ("safety sneakers") are prohibited (due to the difficulties created by these styles in supervising proper use of protective footwear).

Use of specialized equipment will be charged to projects in accordance with established policy and rental rates.

9 PPE Selection

PPE must be selected according to the hazards present, degree of protection required for the job task and the level of protection specified in the HASP.

The level of protection selected must be based on the anticipated and/or measured concentration of contaminant(s) of concern, their physical and chemical properties, toxicity, exposure pathways, and the potential for exposure.

Specific criteria for selecting the level of protection are outlined in the standard HASP package.

10 Training

All employees must be trained in the proper use, care, storage, and limitations of PPE. This training is provided during the initial 40-hour off-site health & safety training program, site orientation and Daily Safety Meetings.

Employees having 24-hour health & safety training are limited to the use of level D protection, unless additional training on the use of respiratory protective equipment is provided.

Annual re-training will be provided in-house during the 8-hour refresher training course.

11 PPE Usage

Employees must wear and properly use all PPE in accordance with instruction and training. Employees must only use PPE for which they have been properly trained.

Employees must wear and properly use all PPE in accordance with the Firm's Health and Safety procedures and the site HASP. Employees must not wear and use PPE beyond the limitations set by the manufacturer.

Disposable PPE must not be reused if it becomes contaminated, torn, or otherwise damaged. PPE must fit the employee. PPE which greatly decreases dexterity, agility, and vision, or is bulky and cumbersome should not be worn. Selection and use of PPE must consider the context of need vs. the creation of a greater hazard by donning PPE in the specific environment.

12 PPE Maintenance and Disposal

PPE must be inspected by the user before and after each use for defects, rips, tears, and/or damaged parts. PPE must be disposed of according to the site HASP and other project plans for the site. PPE destined for disposal must be secured in drums or other containers and labeled appropriately.

If non-disposable, PPE must be decontaminated and sanitized before being reused according to the site HASP and related PPMs. Contaminated PPE which cannot be properly decontaminated by normal procedures must be disposed of accordingly.

STATEMENT OF POLICY:

This procedure details the necessary provisions for complying with 29 CFR 1910.1200 Hazard Communication (HAZCOM) by specifying the protocol for conducting a chemical inventory, compiling a chemical inventory list, obtaining Material Safety Data Sheets (MSDS), and training employees on the health and physical hazards of listed chemicals. This procedure applies to chemical procurement, use, and storage whether in the office laboratory, for actual use or storage, as well as for all chemical materials transported to the field for site use.

Although HAZCOM specifically exempts hazardous waste from the hazard communication program, 29 CFR 1910.120 Hazardous Waste Operation and Emergency Response (HAZWOPER) mandates that an informational program be developed as a component of the written health and safety program. The purpose of the informational program is to ensure that employees, contractors, and subcontractors engaged in hazardous waste operations are appraised of site hazards. Protocol is established for communicating health and physical hazard information to all site employees, including contractor and subcontractor employees.

DESCRIPTION OF PROCEDURE:

1. Chemical Inventory and Listing

   A. The Divisional Health & Safety Coordinator (HSC) has the responsibility to conduct a chemical inventory and compile a listing of all chemicals used or stored in the office or Divisional laboratory. The master chemical listing is to include all chemical materials purchased, such as, but not limited to, chemical materials purchased for sample preparation, equipment calibration and decontamination, etc., whether used in the office laboratory, used by maintenance, or temporarily stored for transport to the field. Not included in the master chemical listing would be items such as:

      1) Foods, drugs, or cosmetics intended for personal consumption by employees;

      2) Any consumer product or hazardous substance used in the workplace in the same manner as normal consumer use, and which use results in a duration and frequency of exposure which is not greater than exposures experienced by consumers; and,

      3) Office products to which office workers would have non-route exposure.

   B. The purchase of any new or addition chemical materials must be approved by the Divisional HSC. New chemical purchases must be added to the master chemical listing.

2. Material Safety Data Sheets (MSDS)

   A. A MSDS for each material listed in the master chemical listing must be obtained from the chemical supplier. **[A standard form letter follows this procedure].**

   B. All chemical purchases must be accompanied by a request for a MSDS. No chemical materials will be received, used, or stored without having an accompanying MSDS.

[Cont'd]

DESCRIPTION OF PROCEDURE: [Cont'd]

3) A review of the physical and health hazards of the chemicals on the master chemical listing; and

4) Measures that the employee must take to protect themselves from the physical and health hazards, such as, appropriate work practices, emergency procedures, and personal protective equipment to be used whenever handling the hazardous chemicals.

B. In addition to the above office training, all employees as well as all contractor and subcontractor personnel retained directly by the Firm to enter a HSCS must, prior to initial site entry, receive formal training in the health and physical hazards specific to the site. Training of both employees and contractor/subcontractor personnel must include the following:

1) Names of all site health & safety personnel and alternates;

2) Site chemical & physical hazards and signs and symptoms of chemical exposure;

3) Work rules and safe work practices;

4) Use of personal protective equipment and the levels of protection specified for the site;

5) Medical surveillance requirements;

6) Site control measures;

7) Decontamination procedures;

8) Location of the site-specific HASP and any accompanying MSDSs;

9) Provisions of the emergency response plan; and

10) Standard operating procedures (i.e. confined space entry, spill containment, etc.).

C. The Site Health & Safety Supervisor (HSS) has the responsibility to conduct the field training of all employees as well as contractor/subcontractor personnel.

D. Provisions to implement and document the above field training requirements must be included in the HASP in Section 5.1.1-Site Orientation (See Guidelines for Health & Safety Plan Development).

5. Chemical Storage

A. All MSDSs must be reviewed for ascertaining storage requirements and precautions. Storage requirements must be strictly followed both in the field as well as the office laboratory.

[Cont'd]

STANDARD LETTER FOR REQUESTING
A MATERIAL SAFETY DATA SHEET

NAME
ADDRESS

Re:

File:

DEAR:

Pursuant to the requirements of 29 CFR 1910.1200 Hazard Communication, we are requesting a current Material Safety Data Sheet (MSDS) for _____ _____. We would appreciate receipt of the MSDS as soon as possible.

Additionally, we would appreciate receipt of any updates MSDS which reflects new or additional toxicological information, a change in regulatory practice or permissible exposure, reclassification of any chemical components as potential or listed carcinogens, and/or any other information we should be made aware of in regards to handling the above listed chemical material.

Sincerely,

COMPANY NAME

NAME
TITLE

STATEMENT OF POLICY:

This procedure details the necessary provisions for administering and coordinating the hearing conservation program. Also provided are guidelines for the use of hearing protective devices.

The hearing conservation program applies to employees enrolled in the medical surveillance program (PPM #1.01.06).

The Firm requires all employees with potential exposure to excessive noise (levels in excess of 85 dBA or equivalent over an 8-hour period) to use hearing protective devices. The Firm defines excessive noise as any noise environment that requires speech levels above those used for normal conversation.

Hearing protection is supplied and/or approved by the Firm for use by employees in carrying out their assignments. For reasons of liability, such hearing protection is not to be used by others (e.g., subcontractor personnel, drilling contractors, plant personnel, etc.). It is the responsibility of other parties to provide hearing protection for their personnel.

DESCRIPTION OF PROCEDURE:

1. Administration

   A. All employees enrolled in the Firm's medical surveillance program are covered by this procedure.

   B. The hearing conservation program is administered concurrent with and as a component of the Firm's medical surveillance program.

2. Responsibilities

   A. Divisional Health and Safety Coordinator (HSC):

      1. Provides initial employee orientation regarding this program.

      2. Informs the Manager, Health & Safety of excessive noise exposures and/or problems encountered concerning the implementation of this program.

      3. Selects the proper hearing protection for employee use.

      4. On projects where a Health and Safety Supervisor (HSS) is not required, the HSC assumes the HSS's responsibilities, listed below, with respect to this program.

   B. Health and Safety Supervisor (HSS):

      1. Determines areas on the work site where hearing protection is required to prevent exposure to excessive noise, as defined above.

      2. Monitors the employees' use of hearing protection.

      3. Reports to the HSC any excessive noise exposures and/or problems associated with the implementation of this program.

[Cont'd]

DESCRIPTION OF PROCEDURE: [Cont'd]

4. Training

   A. All employees required to wear hearing protection will receive training by their Divisional HSC concerning selection, use, maintenance, and limitations of the hearing protective devices.

   B. All employees covered by this program will be trained concerning the contents of this program.

   C. All employees will be trained concerning site specific noise hazards and hearing protection by the HSS as applicable.

5. Hearing Protective Devices

   A. Employees must use hearing protection selected, supplied, and/or approved by the Firm.

   B. Requests for hearing protective devices must be directed to the Divisional HSC.

   C. Employees are required to properly use and maintain hearing protective devices.

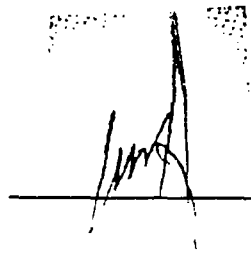
   D. Hearing protective devices are required to be selected by the Divisional HSC based on the potential level of noise exposure.

6. Recordkeeping

   A. All noise exposure measurement records are to be maintained for the duration of employment, plus 30 years.

   B. The Firm will maintain audiometric test records in an employee's medical surveillance file for the duration of the employee's employment, plus 30 years.

- END OF PROCEDURE -

Executive Authorization: 

Date: 11/10/93

BBL	TOPIC: CONFINED SPACE ENTRY	PPM# 1.02.08
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED All

STATEMENT OF POLICY:

The Firm is committed to operate in a manner that will protect the health and safety of its employees. Employees of the Firm will abide by applicable local, state, and federal regulations while conducting activities for the Firm. Entry into enclosed or confined areas presents unique hazards to employees of the Firm. To reduce the potential for injury, personnel will avoid entering confined spaces whenever feasible. If entry is required into a confined space, the safety and engineering controls outlined in this procedure must be implemented by authorized personnel prior to entry.

To effectively mitigate or eliminate the hazards presented by entry into confined spaces, this procedure sets forth the accepted practice for confined space entry and establishes the requirement for a Confined Space Entry Permit protocol. This procedure, protocol, and Confined Space Entry Permit and Checklist applies to all employees of the Firm. Only trained and authorized personnel are permitted to enter confined spaces, supervise confined space activities, and perform rescue from confined spaces.

DESCRIPTION OF PROCEDURE:

1. **DEFINITIONS**

A. Attendant means a trained authorized individual stationed outside the confined space who's sole duty is to monitor authorized entrants inside the confined space.

B. Confined space means any enclosed space which is large enough and so configured that an employee can bodily enter and perform work, has limited or restricted means for entry or exit, and is not intended for continuous employee occupancy. Confined spaces include, **but are not limited to**, storage tanks, vessels, pits, boilers, flues, manholes, ventilation system duct work, sewers, vaults, pipelines, silos, storage hoppers, and diked areas.

1) **Permit-required confined space (permit space)** means a confined space that has one or more of the following characteristics:

a) Contains or has a known potential to contain a hazardous atmosphere;

b) Contains a material with the potential for engulfment of an entrant;

c) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; and/or

d) Contains any recognized safety or health hazard capable of causing injury or death.

2) **A Non-permit confined space** means a confined space that does not contain or have the potential to contain any hazards capable of causing death or serious physical harm.

C. **Entry** means the act by which a employee intentionally passes through an opening into a permit-required confined space. Entry is considered to have occurred as soon as any part of the employee's body breaks the plane of the opening into the space.

2. RESPONSIBILITIES

A. Officers/Division Heads/Project Managers have the following responsibilities:

1) Verify that all confined spaces and entry protocols are properly identified and addressed within the project work plan, project health & safety plan, and/or other project related documents.

2) Verify that their Divisional employees have received the proper confined space training provided by Corporate Health & Safety prior to conducting confined space entry activities.

3) Verify that the proper confined space entry equipment, including personal protective equipment, atmospheric testing equipment, and safety equipment, is available for use by their Divisional employees.

B. Corporate Health & Safety has the following responsibilities:

1) Provide the initial confined space entry training and retraining, as needed, to all entry supervisors, entrants and attendants;

2) Provide technical assistance regarding confined space entry protocol, atmospheric testing equipment, personal protective equipment, hazard assessment, and research information on unusual hazards;

3) Audit project specific confined space entry for compliance with this PPM;

4) Retain a file of cancelled Confined Space Entry Permits for annual review; and

5) Conduct annual review of this PPM and all cancelled permits.

C. The Divisional Health & Safety Coordinators (HSC) have the following responsibilities:

1) Review this PPM with all trained entrants and attendants on a project specific basis;

2) Verify that all entry supervisors, entrants and attendants have received the training offered by Corporate Health & Safety prior to conducting confined space entry activities;

3) Review completed entry permits and verify that the project specific entry supervisor fulfills his/her responsibilities (listed in D below) and properly completes the Entry Permit; and

4) Verify that copies of the completed and canceled Confined Space Entry Permit are properly disseminated and retained with the project files as specified in Section 13-Posting and Recordkeeping.

C. A single Entry Permit may be generated for entry into multiple sewer system manholes in a continuous sewer system.

The Confined Space Checklist and/or the Sewer System Manhole Entry Checklist must be completed, signed, and attached as part of the entry permit. As example, for entry into several separate manholes for the purpose of collecting effluent samples, recording water depth, flow, etc., one Entry Permit may be generated for entry into all project specific manholes. The permit must, however, be accompanied by the Sewer System Manhole Entry Checklist which will facilitate entry into as many as 20 manholes per checklist.

D. The completed and signed Entry Permit and Checklist is valid for one shift only. A new completed and signed Entry Permit must be issued for each new crew of entrants and attendants.

E. All entrants must be evacuated and the Entry Permit must be revoked whenever conditions in the space are no longer acceptable as indicated by the direct reading instruments being used to monitor atmospheric conditions in the confined space or some other circumstance either within or outside the confined space.

4. ENTRY PERMIT PROGRAM

A. Prior to authorizing the Entry Permit, the entry supervisor must verify that the confined space has been properly isolated, ventilated, and tested, and that the Confined Space Checklist or Sewer System Manhole Entry Checklist is completed. In completing the appropriate Checklist, the following items are required:

1) All mechanical apparatus (such as agitators) within or connected to the confined space must be de-energized, locked-out, and tagged. This specific activity may be performed by the client, therefore the entry supervisor must review the lock-out procedure with the client and place a separate lock(s) on all multiple lock-out devices. The entry supervisor must retain possession of the key(s) during the entire confined space entry.

2) All lines connected to the confined space where the nature of the service could present a hazard, such as nitrogen, steam, solvent, acid, or hot water, must be isolated from the confined space. Acceptable isolation methods include removing a valve, spool piece, or expansion joint, and blanking or capping the opened end; inserting a suitable full-pressure blank in the piping between connecting flanges; and/or closing and locking at least two valves in the pipeline and locking open to atmosphere a chain valve between the two closed and locked valves. As in #1 above, this activity may be performed by the client. The entry supervisor must review the isolation/blanking and lock-out procedure with the client. The entry supervisor must attach separate lock(s) to any lock-out device installed. The entry supervisor must retain possession of the key(s) during the entire confined space entry.

3) All electrical equipment around and in the confined space must be deenergized and locked out.

4) For confined spaces which have contained a known hazardous chemical, eg., vessels, storage tanks, etc., the client must verify that the vessel has been thoroughly cleaned by appropriate means, eg., overflowing with water, steaming, etc.

5. TRAINING AND DUTIES OF ENTRY SUPERVISOR

A. 29 CFR 1910.146-Permit Required Confined Spaces assigns specific responsibilities to the client (client or owner of the confined space). These responsibilities include communicating pertinent information regarding the hazards associated with their identified confined space(s) to contractor employees who will enter those spaces. In order to verify that the required information regarding the confined space is properly communicated to employees of the Firm, the entry supervisor must:

1) Investigate the clients' permit entry protocol, ensuring that any identified hazards and previous experience with the confined space is properly communicated;

2) Coordinate rescue assistance with either the client's in-house rescue team and/or the off-site rescue assistance specified by the client. The off-site rescue assistance specified by the client must have direct experience in rescue in the clients' identified confined space; or be provided an opportunity to examine the space and practice a rescue.

3) Verify that the client takes the necessary precautions in notifying their employees that our employees will be entering the confined space;

4) Coordinate entry operations with the employees of the client when both client and employees of the Firm will be working in or near a permit space; and,

5) Inform the client of this permit space program and any additional precautions that will be taken by employees of the Firm during the entry procedure.

B. In addition to acting as the liaison with the client representative, the entry supervisor has the following assigned duties:

1) Recognize the hazards involved with the entry as well as the signs and symptoms of exposure to the hazards;

2) Verify the that both the entry permit and checklist are completed and required equipment is in use prior to entry; and,

3) Monitor entry operations and verify that they remain consistent with the terms of the entry permit and that acceptable entry conditions are maintained.

C. The entry supervisor may also function as either the attendant and/or as an entrant, therefore, the entry supervisor must have the training specified for an attendant and/or an entrant, and will assume the duties listed below for either the attendant and/or the entrant.

E. **Under no circumstances should the attendant attempt rescue of entrants by entering the confined space.**

8. TRAINING CERTIFICATION

A. Training provided to the entry supervisor, attendant, and entrant must be certified by the Firm. Such training certification will be provided by Corporate Health & Safety.

B. Documentation of training certification received by attendance at an outside training course must be provided to Corporate Health & Safety.

9. OUTSIDE RESCUE ASSISTANCE

A. For any project involving a confined space entry, the entry supervisor must address rescue coordination efforts. Such rescue assistance must be coordinated with either the client's designated confined space rescue team and/or with a local emergency response team.

B. Confined space entry shall progress only after proper notification of outside rescue assistance prior to the actual entry activity.

C. An adequate means of communication., eg., cellular telephone for contacting off-site emergency assistance, air horn or two-way radio for summoning a client's rescue team, etc., must be immediately available to the attendant.

10. ATMOSPHERIC TESTING

A. All confined spaces will be tested for atmospheric hazards as follows:

1) Each confined space will initially be tested prior to the entry supervisor authorizing entry.

2) Each confined space will also be tested continuously or at intervals as specified by the entry supervisor.

B. The Entry Supervisor will select continuous or interval monitoring, and specify length of the interval to be implemented during entry. Selection of continuous or interval monitoring will be based on the nature of the confined space hazards present in the permit space, activity during entry, and potential for hazards developing in the confined space.

C. All confined spaces must be tested for atmospheric hazards prior to each entry, and as entry proceeds. **The following are the testing sequence and acceptable air quality criteria:**

1) Oxygen content for all confined space entry must be 19.5 to 23.5%;

2) Combustible gas or vapor must not exceed 10% of its lower explosive limit (LEL);

3) Toxic gas or vapor must not exceed 50% of the Permissible Exposure Limit (PEL) or other published exposure guideline;

12. WORK PRACTICES

A. All entrants must wear a retrieval line secured on one end to the entrant by a full-body harness, or parachute harness, and the end secured outside the space for vertical-entry confined spaces, the lifeline must be secured to a lifting or other mechanical retrieval device. **Reliance on manually lifting an entrant from a vertical confined space is prohibited.** If more than one entrant is entering the space, each line shall be clearly marked to identify the entrant and the mechanical retrieve system must be rated for multiple entrant use.

B. Where mechanical ventilation will be relied upon for eliminating an actual or potential hazardous atmosphere, the atmosphere of the space must be continually monitored to verify that the continuous forced air ventilation is preventing the generation or accumulation of a hazardous atmosphere.

C. Whenever a ladder is required for confined space entry, the ladder must be secured and not withdrawn while anyone remains within the confined space except as necessary to permit extraction during rescue.

D. Adequate illumination must be provided for all confined space entry. An approved type (explosion-proof) lighting device must be used.

E. All electrical equipment used within a confined space must be explosion-proof and must be inspected prior to use to verify good working condition. The equipment must utilize a ground fault interrupt and/or be properly grounded.

F. Whenever the confined space is structured such that visual contact can not be maintained between entrants and the attendant, intrinsically-safe two-way radios must be utilized to maintain continuous contact between entrants and attendants.

G. All confined spaces must be isolated prior to entry.

H. Prior to opening or removing lids, covers, access doors, or hatches of a confined space, precautions must be taken to determine if it is safe to do so.

I. Whenever entering manholes or other confined spaces with permanent ladders, all rungs must be inspected to verify they are in safe and useable condition.

J. When working in a vertical confined space, precautions must be taken to prevent equipment and personnel from falling into the confined space opening. Tools should be lowered and removed from the space using a basket or sling to prevent falls and falling objects.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

CONFINED SPACE ENTRY CHECKLIST

All Copies of Permit Must Remain at Job Site Until the Entry is Completed

Permit # _____

Project _____ Date _____ Time _____

Location and Description of Confined Space: _____

_____

Checklist	Yes	No	NA
All lines to and from confined space blanked, capped, or isolated	☐	☐	☐
Electrical service locked out (entrant with key)	☐	☐	☐
Mechanical devices/systems are restrained and locked out	☐	☐	☐
Explosion-proof electrical equipment in use	☐	☐	☐
Ladders secured at top	☐	☐	☐
Ground fault circuit interrupter checked and functioning	☐	☐	☐
All ignition sources identified and isolated	☐	☐	☐
Respirators and air supply equipment in proper condition	☐	☐	☐
Safety harnesses and lifelines in proper condition	☐	☐	☐
Required personal protective equipment being utilized	☐	☐	☐
Monitoring equipment calibrated and functioning properly	☐	☐	☐
Atmospheric testing completed	☐	☐	☐
Trained attendant on standby	☐	☐	☐
Emergency equipment ready for use	☐	☐	☐
Rescue provisions in place	☐	☐	☐
Warning signs posted	☐	☐	☐
Ventilation equipment functioning properly	☐	☐	☐
Retrieval system functioning properly (tripod with life lines)	☐	☐	☐
Communication device for entrants and attendants	☐	☐	☐
Area secured to eliminate unauthorized entry	☐	☐	☐
Entry personnel trained for confined space entry	☐	☐	☐
Confined space entry permit completed and posted	☐	☐	☐
Permanent ladder rungs in safe condition	☐	☐	☐

Monitoring Frequency: ☐ Continuous ☐ 5 min. ☐ 10 min. ☐ 15 min. ☐ 30 min.

Monitors Name: _____ Initials _____

	Confined Space Air Monitoring Parameters				
	% Oxygen	% LEL	H_2S	CO	Other _____
Time of Reading	>19.5%	<10%	<5 ppm	<20 ppm	<50% of PEL
Pre-Entry					

Entry Supervisor _____
Print

Signature Date Time

Air Monitor _____
Print

Signature Date Time

BBL	TOPIC: DAILY SAFETY MEETINGS	PPM# 1.02.09
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees, and will abide by applicable state and federal agency regulations when performing field work. In order to effectively implement site-specific procedures and verify that all on site personnel understand hazards and the methods to detect them, protective measures, and emergency procedures, a Daily Safety Meeting (DSM) will be held each day prior to commencement of field activities.

DESCRIPTION OF PROCEDURE:

The Site Supervisor or Health and Safety Supervisor will hold a meeting with all site workers to discuss the day's activities, and the safety and health issues related to those activities. This meeting must be attended by all BBL employees, all subcontractors, and any other site personnel who could benefit from the information presented. Topics which must be covered include, as a minimum:

- A description of the work to be done and how it is to be done;
- The chemical, physical, and biological hazards posed by the activities to be conducted;
- The methods used to detect the presence of chemical, physical, and biological hazards, including action levels or conditions for upgrade/downgrade of PPE, or site evacuation;
- The protective equipment required to protect against the hazards;
- The work practices necessary to minimize exposure potential;
- The emergency procedures to be followed, including the phone numbers of police, fire, and ambulance;
- The means of communication to be used, including hand signals, horn blasts, etc.;
- The names of personnel and alternates responsible for site safety;
- Safe use of engineering controls and equipment on the site; and
- Hazards associated with site weather conditions.

The meeting must be documented and all participants must sign the documentation indicating their participation. This meeting is an excellent time to verify project participants have the proper protective equipment, and they understand the work to be done and the procedures to be followed. **This meeting must be repeated for newcomers to the site or if site conditions or the nature of the work changes.** A standard form for documenting the meeting is attached to this procedure.

BBL	TOPIC: BLOODBORNE PATHOGENS	PPM# 1.02.10
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees and will abide by applicable state and federal agency regulations. In order to protect employees of the Firm from the hazards posed by bloodborne pathogens, this procedure presents health and safety requirements for personnel who may be exposed to these hazards, particularly voluntary first aid and cardiopulmonary resuscitation (CPR) care providers. In order to meet the requirements of Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) §1910.151, at least one person on a project site will be adequately trained in first aid and CPR, in the requirements of the Bloodborne Pathogens Standard as listed in 29 CFR §1910.1030, and in the contents of this procedure.

DEFINITIONS:

Bloodborne Pathogens

Bloodborne pathogens are agents (i.e., bacteria, virus, fungi) found in blood, blood components, and certain body fluids. Exposure may result from direct contact with blood and body fluids, or contact with materials, objects, or surfaces that have had contact with blood or body fluids. Bloodborne pathogens are capable of causing human disease or death to unprotected people who come into contact with blood or blood-affected items. Diseases caused by bloodborne pathogens include, but are not limited to, hepatitis B virus (HBV), human immunodeficiency virus (HIV), hepatitis C, malaria, and syphilis.

Exposure

Any contact with blood or body fluids, or contact with equipment/surfaces contaminated by blood or other potentially infectious materials is considered exposure. Significant exposure involves contact or absorption of blood or blood-contaminated objects through open or broken skin (i.e., cuts, scratches, rashes), punctures through the skin with a contaminated sharp object , or blood splashes to the eyes, nose, or mouth.

Hepatitis B Virus (HBV)

HBV is the major bloodborne pathogenic hazard that first aid/CPR care providers are likely to encounter. The HBV can remain infectious for up to 10 days even in dried blood. The virus adversely affects 8,000 to 10,000 workers annually resulting in approximately 200 deaths each year.

HBV Exposure Symptoms

Hepatitis means "inflammation of the liver", and can cause severe liver damage or cirrhosis. Exposure symptoms include fever, fatigue, nausea, vomiting, muscle aches, loss of appetite, and jaundice (yellowing of the eyes or skin). Hepatitis diagnosis is difficult because some symptoms are similar to the flu and may remain mild for an extended period of time. Presently, no cure exists for hepatitis. It can be prevented with a vaccination.

Human Immunodeficiency Virus (HIV)

HIV attacks and deteriorates the body's immune system and eventually weakens it to the point that infection sets in, causing the disease Acquired Immune Deficiency Syndrome (AIDS). .HIV is transmitted through contact with blood and body fluids. HIV is not transmitted by touching or working with people who are HIV-positive.

HIV Exposure Symptoms

HIV can lead to suppression of the immune system to a degree sufficient to permit the onset of neurological problems, cancer, pneumonia, and death. People may carry the virus for many years without experiencing any symptoms. Upon

2) *Protective Measures*

The establishment of work practice controls is an integral part of an effective exposure control plan. These work practices are designed to protect employees from reasonably foreseeable occupational exposures to bloodborne pathogens from blood and other potentially infectious material. The work practice controls outlined in this section are applicable to the administration of first aid in emergency situations and subsequent cleanup.

A) Universal Precautions

Universal precautions is an approach to infection control which operates on the assumption that all human blood, bodily fluids, and sharps or other medical waste are to be treated as if they are known to be contaminated with HIV, HBV, or other infectious diseases. Universal precautions shall be implemented whenever there exists a foreseeable potential for contact with blood or bodily fluids.

B) Personal Protective Equipment

The following are specific personal protective equipment items that shall be utilized:

- Always wear hand (i.e. latex or nitrile surgical gloves) and eye (i.e. safety glasses, goggles) protection when administering first aid or CPR.
- Always use an appropriate mouthpiece or ventilation device when administering rescue breathing or CPR.
- Inspect all PPE prior to use to ensure it is intact and is in good working order.
- After use, remove gloves from top to bottom inside-out, not allowing unprotected skin to contact the exterior of the gloves.
- Do not reuse gloves once removed; use different gloves for each patient.

C) Work Practice Controls

Work practice controls shall be instituted whenever foreseeable potential contact with, or exposure to, blood and bodily fluid exists. Examples of situations in which these controls are to be implemented include, but are not limited to, accidents or injuries in which administration of first aid is required, application of bandages to minor cuts and abrasions of another person, and contact with sores, wounds, or broken skin.

Since many worksites are in remote locations, providing hand washing facilities is difficult. For instances where hand washing facilities cannot be provided, BBL will provide employees with antiseptic towelettes or an antiseptic hand cleaner and clean cloth or paper towels.

The following are specific work practice controls that shall be implemented:

- Open wounds or cuts will be promptly bandaged.
- Wash hands and face as soon as possible after administering first aid or CPR. If wash facilities are not readily available, disposable one-time use towelettes are acceptable.
- PPE must be removed immediately upon leaving the work area and placed in an appropriate container for storage, washing, decontamination, or disposal.
- No eating, drinking, or smoking is allowed in any work area where a potential exists for occupational exposure to bloodborne pathogens.

B) Post-Exposure Procedures and Evaluation

Subsequent to all reported exposure incidents, a confidential medical evaluation and follow-up shall be made available to each employee exposed in an incident. If a responder has not been vaccinated, an HBV vaccination series will be offered within 24 hours.

5) Documentation Procedures

Documentation of the exposure incident shall be recorded as soon as possible, and include the route(s) of exposure, the circumstances surrounding the incident, identification of the source individuals, and identification of potentially exposed persons. Additionally, each incident involving voluntary first aid providers shall be placed on the "first aid incident list" attached to the location OSHA Log of Occupational Injuries and Illnesses.

6) Blood Testing

A) Source Individuals

As soon as feasible, the source individual in an exposure incident will be asked to consent to a blood test to determine HBV and HIV infectivity. Where applicable laws require employee consent, documented consent shall be obtained prior to testing. If an employee refuses the blood test, documentation of the refusal will be made. Documentation of the test results shall be made available to the exposed employee(s). All results will be kept confidential.

B) Exposed Employees

Exposed employees will be asked to consent to a blood test for HBV and HIV serological status. If consent to HIV testing is denied, the blood sample will be preserved for 90 days, within such time the employee may elect to consent to the HIV test.

C) Post-Exposure Medical Evaluations

Exposed employees shall receive a healthcare professional's written opinion for post-exposure evaluations. The written opinion shall include the results of the evaluation and any medical conditions resulting from the exposure incident which requires further medical treatment.

6) Hazard Communication

A) Warning Labels

Containers used for disposal of blood contaminated supplies and waste will be labeled in accordance with the word "biohazard."

B) Warning Signs

There are no designated areas for medical treatment on site, since first aid will be provided on an emergency basis only, and therefore warning signs are not applicable. In cases of potential exposure, observers and non essential personnel should be verbally warned to keep a safe distance from injured personnel.

7) Employee Training Program - Voluntary Providers

All employees who are first aid/CPR trained and may provide assistance shall be trained in the requirements for voluntary providers as described in this procedure. The training program includes the following elements:

- A copy of 29 CFR §1910.1030 for review;

STATEMENT OF POLICY:

The Firm is committed to operate in a manner which protects the health and safety of its personnel. Employees of the Firm must abide by applicable local, state, and federal regulations while conducting activities for the Firm. To maintain a safe and healthful workplace, employees of the Firm must utilize the procedures outlined in this PPM for any excavation activity conducted as part of the Firm's business.

This PPM sets forth standard procedures to be utilized by employees of the Firm when working with open excavations made in the earth's surface. This procedure also establishes administrative roles and responsibilities to meet the requirements and definitions of 29 CFR 1926 Subpart P.

To reduce the potential for injury, personnel must avoid entering excavations whenever feasible alternatives exist. If entry into an excavation cannot be avoided, the safety and engineering controls outlined in this procedure must be implemented by authorized personnel under direct supervision of personnel competent with respect to potential hazards present and regulatory requirements of 29 CFR 1926 Subpart P.

DESCRIPTION OF PROCEDURE:

1. OSHA DEFINITIONS FOR EXCAVATION ACTIVITIES

A. *Aluminum Hydraulic Shoring* means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wailers). Such system is designed to support the sidewalls of an excavation and prevent cave-ins.

B. *Benching* (Benching system) means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

C. *Cave-in* means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

D. *Competent person* means one who, through education, training, and/or experience, is capable of identifying existing and predictable hazards or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

E. *Excavation* means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

F. *Failure* means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

G. *Hazardous atmosphere* means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause illness, injury, or death.

2. ADMINISTRATIVE ROLES AND RESPONSIBILITIES

A. Officers/Division Heads

1) Verify that all excavation activities are properly identified and addressed within a project work plan, site health and safety plan and/or other project documents.

2) Verify that employees designated as "competent person" for excavation activities have experience, training, and authority to fulfill the requirements of the position.

3) Verify that proper excavation and personal protective equipment is available for use by divisional employees.

B. Corporate Health and Safety Associate

1) Review and revise this procedure as required to meet regulatory requirements.

2) Provide technical assistance regarding excavation procedures, hazard identification, "competent person" designation, and personal protective systems.

3) Audit project specific excavation activities for compliance with this procedure.

4) Review and revise, as appropriate, site-specific health and safety plans to include requirements for excavation activities.

5) Verify that all employees assigned as a "competent person" for excavation activities meet the OSHA definition as such with respect to training and authority.

C. Regional Health and Safety Coordinators

1) Verify that all employees assigned as a "competent person" for excavation activities meet the OSHA definition as such with respect to training and authority.

2) Provide technical assistance regarding excavation procedures, hazard identification, "competent person" designation, and personal protective systems.

3) Audit project-specific excavation activities for compliance with this procedure.

4) Review and revise, as appropriate, site-specific health and safety plans to include requirements for excavation activities.

D. Divisional Health and Safety Coordinators

1) Review this PPM with all employees involved with excavation activities on a project specific basis;

C. When excavating in areas near underground installations, proper precautions must be taken to determine the exact location of the installations and to adequately protect and support them. While an excavation is open, underground installations shall be protected, supported or removed as necessary to protect employees.

D. Structural ramps used as a means of access and egress to/from excavations must be designed by a "competent person", constructed of uniform materials, securely attached, and treated to prevent slipping.

E. If personnel are working in a location exposed to vehicular traffic they must be provided with and be required to wear reflective safety vests.

F. Personnel are not permitted to be beneath elevated loads handled by equipment.

G. Mobile equipment located near open excavations must be adequately protected from falling or rolling into excavations by the use of barricades or warning devices.

H. All excavations over 4 feet in depth must be tested for hazardous atmospheres whenever personnel are required to enter and a potential exists for the existence of hazardous contaminants or oxygen deficiency. Excavations under 4 feet in depth must be evaluated by the competent person and, at the competent person's discretion, tested for hazardous atmospheres whenever personnel are required to enter and a potential exists for the existence of hazardous contaminants or oxygen deficiency.

I. Means of rescue including a lifeline and body harness must be used by personnel entering excavations with a potential for air hazards. A standby person must be stationed outside the excavation to tend the lifeline(s).

J. Water must not be allowed to accumulate in open excavations where employees are working. When necessary, means such as diverting natural drainage around the excavation or actively pumping water must be used to prevent or control water accumulation.

K. All structures adjacent to an open excavation must be supported, or a registered professional engineer must determine that the structure will not be affected by the excavation activities.

L. Excavated materials (spoil) must be placed no closer than 2 feet from the edge of an open excavation, and otherwise retained to prevent loose material from falling into the excavation.

M. Protection such as guardrails, barricades, or covers must be in place to protect personnel from possible falls into open excavations, pits, wells, and shafts.

N. Work tasks will be designed to limit the number of personnel required to enter any excavation. All tasks that can be completed remotely from outside the excavation (such as soil sampling) will be conducted in such a manner.

O. Personnel will not be allowed to enter any excavation unless adequate protective systems and procedures are utilized to prevent accidents and injury.

d. The excavation must be designed by a registered professional engineer.

B. Sloping

1) If sloping is selected as the protective system for an excavation, the excavation sides must be sloped at a maximum of 34° (1 1/2 Horizontal: 1 Vertical), uness the procedure in #2 is followed.

2) Soil classification in accordance with Section 10 of this procedure) is required for all excavations with sides which will be sloped greater than 34° (1 1/2 Horizontal: 1 Vertical) and

a. Sloping, based on soil classification, as specified in 1926 Subpart P Appendix B must be utilized;

b. A sloping system which follows other tabulated data (approved by a registered professional engineer) must be utilized; or

c. The excavation must be designed by a registered professional engineer.

6. ATMOSPHERIC TESTING FOR ENTRY

A. Any excavation over 4 feet in depth with a potential for hazardous contaminants or oxygen deficiency must be tested for hazardous atmospheres prior to and during activities involving entry.

B. The site designated "competent person" will document initial and periodic air monitoring results for all activities requiring entry into the excavation.

C. All atmospheric testing of excavations must be conducted in the following sequence and meet the following air quality criteria:

1) Oxygen content must be 19.5 to 23.5%;

2) Combustible gas or vapor must not exceed 10% of its lower explosive limit (LEL);

3) Toxic air contaminant levels must not exceed 50% of the permissible exposure limit for the specific contaminant;

4) Carbon monoxide must not exceed 20 ppm; and

5) Hydrogen sulfide must not exceed 5 ppm.

7. LOCATION OF UNDERGROUND/OVERHEAD UTILITIES

A. The competent person and the project manager shall both verify that local underground facilities location/protection agencies are notified within the required time frame prior to the initiation of excavation activities.

C. Project - Specific Training

1. Site orientation on excavation projects shall include a discussion of:

a) Site excavation hazards and procedures;
b) Requirements for conducting activities remotely whenever possible;
c) Client requirements and procedures for excavation activities; and
d) This PPM.

2. Daily Safety Meetings on projects involving excavation activities shall include a discussion of:

a) Site excavation hazards and procedures;
b) requirements for conducting activities remotely whenever possible;
c) Client requirements and procedures for excavation activities; and
d) This PPM.

10. SOIL CLASSIFICATION FOR SELECTION OF PROTECTIVE SYSTEMS

A. Soil Classification

1) This section describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. This section contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

2) This section applies when a sloping, benching or shoring system is utilized as a method of protection for employees from cave-ins.

3) Soil Classification Definitions

a) **Cemented soil** means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.
b) **Cohesive soil** means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sides, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.
c) **Dry soil** means soil that does not exhibit visible signs of moisture content.
d) **Fissured** means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.
e) **Granular soil** means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

(2) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam;
(3) Previously disturbed soils, except those which would otherwise be classed as Type C soil;
(4) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration;
(5) Dry rock that is not stable; or
(6) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4 Horizontal:1 Vertical), but only if the material would otherwise be classified as Type B.

c) **Type/Class C Soils** are:

(1) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less;
(2) Granular soils including gravel, sand, and loamy sand; or
(3) Submerged soil or soil from which water is freely seeping; or
(4) Submerged rock that is not stable; or
(5) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4 Horizontal:1 Vertical) or steeper.

5) Methods for Classifying Soils

a) Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in this section.
b) The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis conducted by a competent person using tests described below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.
c) The visual and manual analyses, such as those noted as being acceptable in this section, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(1) Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(a) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(d) **Other strength tests.** Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

(e) **Drying test.** The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:

(1) If the sample develops cracks as it dries, significant fissures are indicated.

(2) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material, and the unconfined compressive strength should be determined by using the thumb penetration or other test.

(3) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

6) Layered system

a) A layered system shall be classified in accordance with its weakest layer.

b) Each layer may be classified individually where a more stable layer lies under a less stable layer.

7) Reclassifying Soils

a) If, after classifying a soil, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person.

b) The soil shall be reclassified as necessary to reflect the changed circumstances.

- END OF PROCEDURE -

Executive Authorization: _____ **Date:** 5/6/96

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

UNDERGROUND/OVERHEAD UTILITY CHECKLIST

Project Name_____ Date_____

Location_____

Prepared By_____ Project Manager_____

This checklist must be completed for any intrusive subsurface work such as excavation or drilling. It documents that overhead and underground utilities in the work are identified and located. The Project Manager shall request utility markouts before that start of field operations to allow the client and utility companies sufficient time to provide them. If complete information is not available, a magnetometer or other survey shall be performed to locate obstacles prior to intrusive subsurface activities.

Procedure

A diagram of the work area depicting the proposal location of intrusive subsurface work sites (i.e., boring locations, excavation locations) must be attached to this form. The diagram must clearly indicate the areas checked for underground structures/utilities, and overhead power lines. This form and the diagram must be signed by the BBL Project Manager, the BBL Site Supervisor, and the client representative.

Checklist

Type of Structure	Present	Not Present	Method of Markout
Electric Power Line			
Natural Gas Line			
Telephone Line			
Water Line			
Product Line			
Sewer Line			
Steam Line			
Drain Line			
Underground Tank			
Underground Cable			
Overhead Power Line			
Overhead Product Line			
Other (Specify)			

Client Representative_____ Date_____

BBL Project Manager_____ Date_____

BBL Site Supervisor_____ Date_____

BBL	TOPIC: LOCKOUT/TAGOUT CONTROL OF HAZARDOUS ENERGY/MATERIALS	PPM# 1.02.12
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

It is the policy of the Firm to provide a safe and healthful workplace for its employees. An integral component of the Firm's health and safety program is the Lockout/Tagout Control of Hazardous Energy/Materials PPM. This procedure details the administration and necessary provisions for protecting employees of the Firm from injuries associated with hazardous energy, unexpected start-up of equipment, and hazardous materials. This procedure will be implemented by project personnel in conjunction with other policies and procedures, as part of the Firm's comprehensive safety program. This policy delineates guidelines for employees to follow when performing work in, on, and around energized equipment as defined in the Occupational Health and Safety Administration Standard, 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout). This procedure also assigns responsibility for administration and training with respect to lockout/tagout procedures.

DESCRIPTION OF PROCEDURE:

1. DEFINITIONS

An affected employee is a person who operates or uses a machine and/or equipment that receives servicing or maintenance under lockout and/or tagout, or who works in an area where such servicing or maintenance is being performed.

An authorized employee is a person who locks out and/or tags out a machine and/or equipment in order to perform servicing or maintenance on the machine. An affected employee becomes an authorized employee when that employee's duties include performing service and/or maintenance under lockout/tagout.

An energy isolating device is a mechanical device that physically prevents the transmission or release or energy, including but not limited to the following: A manually operated electrical circuit breaker, a disconnect switch, a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a line valve; a block; a chain; restraining device to prevent the movement of equipment; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Lockout is the placement of a lock or lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Tagout is the placement of a tag on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tag is removed.

Restraint is the application of a chain, block, or other similar mechanical means to prevent movement of a part of a system/device.

2. ADMINISTRATION

A. All employees of the Firm are covered by this procedure.

B. Employees of the Firm are required to follow all health and safety rules developed for lockout/tagout.

3) Determine if a client currently has lockout/tagout procedures for a site. If the client does currently have lockout/tagout procedures, then corporate health and safety must review the procedures to determine if they are consistent with the Firm's procedures, and the most protective of the procedures will be followed.

C. Corporate Industrial Hygiene/Environmental Safety Associate (CSA)

1) Communicates with RHSC, DHSC, and HSS concerning the addition of any new lockout/tagout procedures;

2) Enforces lockout/tagout procedures;

3) Reviews project health and safety plans to assure they are consistent with the provisions of this procedure;

4) Communicates changes in current lockout/tagout regulations and changes in this procedure to employees; and

5) Reviews and updates this procedure at least annually to assure compliance with regulatory requirements.

D. Regional Health & Safety Coordinators Roles and Responsibilities

1) Provide DHSC support and training required to execute Lockout/Tagout responsibilities;

2) Provide employee Lockout/Tagout training in lieu of DHSC as necessary;

3) Reviews project health and safety plans to assure they are consistent with the provisions of this procedure;

4) Provides required orientation regarding lockout/tagout procedures to Division Health and Safety Coordinators (DHSCs) and Health and Safety Supervisors (HSSs); and

5) Verify that Lockout/Tagout procedures are being implemented.

E. Divisional Health and Safety Coordinators (DHSC) Responsibilities

1) Provide initial employee orientation concerning lockout/tagout procedures;

2) Communicate need for additional lockout/tagout procedures to CSA;

3) Enforce all applicable lockout/tagout procedures; and

4) Communicate changes in this procedure to divisional employees.

B. Lockout devices and tags are color coded red, and are the only device(s) used for controlling energy. Locks and tags must not be used for other purposes. All locks and tags provided by the Firm are capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected. Locks and tags are of substantial construction in order to prevent inadvertent or accidental removal. All tags are required to be marked to identify the employee applying the lock(s)/tag(s).

C. Tags are of standard print and format. Tags are constructed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible. Tags will warn against hazardous conditions if the machine or equipment is energized, and will include a legend such as the following:"Do Not Start"." Do Not Open"." Do Not Close"." Do Not Energize" or " Do Not Operate", depending on application.

D. When replacement or major repair, renovation or modification of a machine or equipment is performed, and when new machines or equipment are installed, energy isolating devices designed to accept a lockout device for such machines or equipment will be installed.

6. SAFETY PROCEDURES FOR LOCKOUT/TAGOUT AND ISOLATION

A. The Firm requires the use of a lockout device and an attached tag on all isolating devices capable of being locked out or accepting lockout devices. If an energy isolating device is not capable of being locked out, the Firm requires the use of a tagout system designed to provide full employee protection against equipment start-up. When a tagout device is used on an energy isolating device, the tag shall be attached at the same location that the lockout device would have been attached. Additional precautions will be implemented to provide a level of safety equivalent to that obtained by using a lockout device. Additional safety measures may include such steps as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

B. Lockout/tagout isolation procedures will be initiated only by authorized personnel. Personnel not trained in lockout/tagout procedures are not authorized to install, inspect, repair, adjust, remove, maintain, or service equipment where the potential for injury due to accidental start-up, energization, or release of stored energy exists.

C. All affected personnel must be notified prior to equipment deactivation and isolation.

D. All affected personnel must be notified prior to equipment reactivation after isolation measures have been removed.

E. Personnel involved with lockout/tagout isolation of equipment shall receive information concerning the specific type and magnitude of energy or hazardous material involved, the hazards involved, and the method of control to be utilized.

F. Authorized personnel shall de-energize equipment by following a procedure developed specifically for the equipment involved and consistent with 29 CFR 1910.147.

B. The CSA or RHSC will select an authorized person to conduct an audit to review any equipment-specific SOPs and the general SOP. A designated individual will review the lockout/tagout procedure for a specific machine or general application and complete the Periodic Inspection Form.

C. The CSA and RHSC will review and maintain documentation of each lockout/tagout procedure audit.

D. Each SOP and this PPM must be audited at least once every calendar year.

8. GENERAL LOCKOUT/TAGOUT STANDARD OPERATING PROCEDURE (SOP)

A. If a client has specific written lockout/tagout procedures for its facility equipment with which employees of the Firm are working then the SOP will be reviewed and the more protective of the SOP or this PPM will be utilized.

B. This standard operating procedure is applicable to maintenance and servicing activities that are not covered by a client's SOP or require the use of lockout/tagout procedures for which an equipment-specific written lockout/tagout SOP does not exist or is under development.

1) Only employees who have received training as authorized employees under the Company Lockout/Tagout Program are authorized to implement this lockout/tagout procedure. Only authorized employees may affix locks/tags to energy-isolating devices on the referenced equipment/machines and conduct the above-referenced service and maintenance activities. Authorized employees have received lockout/tagout training concerning the implementation of this standard operating procedure. Unauthorized employees shall not conduct the above-referenced service and maintenance activities or affix locks/tags to energy-isolating devices on the referenced equipment/machines. All employees, upon observing a machine and/or equipment that is locked and/or tagged out, shall not attempt to start, energize, or use the machine and/or equipment.

2) All employees affected by implementation of this SOP must be notified by the authorized employee(s) prior to equipment/machine shutdown and isolation.

3) Locate and Identify Type of Energy Requiring Lockout/Tagout:

☐ Electrical ☐ Hydraulic ☐ Chemical
☐ Mechanical ☐ Pneumatic ☐ Thermal
☐ Hazardous Material ☐ Other:_____

4) Lockout/Tagout Sequence

a. The authorized employee(s) shall notify all affected employees prior to the shutdown and isolation of the equipment/machine. Affected employees should be informed of the reason for shutdown and approximate length of time required for servicing or maintenance.

5) Release of Lockout/Tagout and Return of Equipment to Service

a. When the equipment/machine is ready to be returned to service at the conclusion of work activities, the following steps shall be taken to safely return equipment to service:

(1) Check the machine/equipment and immediate area to ensure that non-essential items and tools have been removed;

(2) Check to ensure that all guards and covers have been replaced;

(3) Check to ensure that all employees are safely positioned or have left the area;

(4) Check to ensure that all operating controls are in the neutral or off position;

(5) All authorized employees shall personally remove their individual locks and tags from the isolation devices; and

(6) All affected employees must be notified that the work activities are completed and the equipment/machine is ready for use.

b. If work activities are not completed prior to a shift ending(or other personnel change), then the procedures in Section 6 must be followed.

6) Transfer of Lockout/Tagout During Shift and Personnel Changes

a. The supervisor shall designate an authorized employee who shall control the lockout/tagout devices at the end of a shift and shall be responsible for transferring lockout/tagout authority to the next shift.

b. The designated authorized employee shall not remove his/her lock from any of the isolation devices until at least one of the arriving authorized employees has locked out and tagged out all of the isolation devices.

c. If the arriving authorized employees assuming responsibility for lockout/tagout do not attach locks prior to the previous shift employees removing all of their locks, then the employees assuming lockout/tagout authority shall repeat the entire lockout/tagout sequence.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

STRAIGHT BILL OF LADING

Date _____

Carrier Name:
Carrier Address:

Consignment

Proper Shipping Description	LQ	Number of Units	Total
1.			
2.			
3.			
4.			

Emergency Response Information

1. ERG #:
2. ERG #:
3. ERG #:
4. ERG #:

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Shipper:	
Per:	
Carrier:	
Per:	

BBL	TOPIC: HAZARDOUS MATERIALS TRANSPORTATION	PPM#: 1.02.13
Policy & Procedure Memo	SECTION: Health & Safety	COMPANY LOCATIONS AFFECTED: All

STATEMENT OF POLICY:

The Firm is committed to operate in a manner that will protect the health and safety of its employees. Employees of the Firm will abide by all applicable local, state, and federal regulations while conducting activities for the Firm. In order to comply with the United States Department of Transportation (USDOT) Hazardous Materials Regulations (HMR), all employees involved in the packaging, labeling, shipping, and transportation of hazardous materials will do so in accordance with this procedure.

This procedure details the necessary provisions for complying with 49 CFR Parts 171 - 178 (HMR) by specifying the protocol for:

1. determining the applicability of small and limited quantity restrictions;
2. proper packaging, marking and labeling packages containing hazardous materials;
3. completion and use of shipping papers;
4. proper classification of environmental samples intended for either laboratory testing or project-related storage; and
5. training of BBL employees involved in the packaging, labeling, shipping, transportation of hazardous materials.

This procedure applies only to those hazardous materials which are either transported by BBL employees, or offered for transport (e.g., to a carrier such as UPS, Federal Express, etc.). In the case of materials to be transported by a carrier, consult the carrier regarding any special requirements they may have. Please note that it is a federal offense subject to fine and/or imprisonment if you attempt to carry a hazardous material onto a passenger aircraft without proper packaging, and without declaring said material.

DESCRIPTION OF PROCEDURE:

1. ADMINISTRATION

A. All employees of the firm are covered by this procedure.

2. DEFINITIONS

Combination packaging means a combination of packaging, for transportation purposes, consisting of one or more inner packaging secured in a non-bulk outer packaging. It does not include composite packaging.

Composite packaging means packaging consisting of an outer package and an inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, shipped and emptied as such.

Limited quantity — when specified for a particular material, means the maximum amount of hazardous material for which there is a specific labeling or packaging exception.

Marking — means a descriptive name, identification number, instructions, cautions, weight, specification, or UN marks, or combinations thereof, required by this subchapter on outer packaging of hazardous materials.

Mode — means any of the following transportation methods; rail, highway, air, or water.

Motor vehicle — includes a vehicle, machine, tractor, trailer, or semitrailer, or any combination thereof, propelled or drawn by mechanical power and used upon the highways in the transportation of passengers or property. It does not include a vehicle, locomotive, or car operated exclusively on a rail or rails, or a trolley bus operated by electric power derived from a fixed overhead wire, furnishing local passenger transportation similar to street-rail-way service.

Non-bulk packaging — means a package which has:

A. A maximum capacity of 450 L (119 gallons) or less (as a receptacle for a liquid);
B. A maximum net mass of 400 kg (1000 pounds) or less and a maximum capacity of 450 L or less (as a receptacle for a solid); or
C. A water capacity of 454 kg or less (as a receptacle for a gas as defined in §173.115).

n.o.s. — means not otherwise specified.

n.o.s. description — means a shipping description from the HMT which includes the abbreviation n.o.s., and as contained in the lists in §172.203(k)(3), regarding additional description requirements.

Outer packaging — means the outermost enclosure of a composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packaging.

Packaging — means a receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this subchapter. For radioactive materials packaging, see §173.403.

Packing group — means a grouping according to the degree of danger presented by hazardous materials. Packing Group I indicates great danger; Packing Group II, medium danger; Packing Group III, minor danger. See §172.101(f).

4. HAZARDOUS MATERIAL TRANSPORTATION BY BBL EMPLOYEES

A. Small Quantities

Any BBL employee who, during the course of employment, transports hazardous materials in a vehicle from one location to another using commercial roadways is required by regulation to properly package and label the material. The employee must also have shipping papers for the materials being transported, unless the hazardous material is being transported as a small quantity.

Per 49 CFR §173.4, "small quantities of Class 3 (flammable/combustible liquids), Division 4.1 (flammable solid), Division 5.1 (oxidizer), Class 8 (corrosive materials), Division 6.1 (poisonous materials), Class 9 (miscellaneous), and Class 7 (radioactive) materials that also meet the definition of one or more of these hazard classes, are not subject to any other requirements of this subchapter (HMR) if:

1. The maximum quantity of material per inner receptacle is limited to:

   a. Thirty mL (one ounce) for authorized liquids other than Division 6.1, PGI materials;
   b. Thirty grams (one ounce) for authorized solids, other than Division 6.1, PGI materials;
   c. One gram (0.04 ounces) for authorized materials classed as Division 6.1, PGI; and
   d. Any activity level not exceeding that specified in §173.421, 173.422 or 173.424, as appropriate, for a package containing a Class 7 material.

2. With the exception of temperature sensing devices, each inner receptacle:

   a. Is not liquid full at 55 °C (131 °F), and
   b. Is constructed of plastic having a minimum thickness of no less than 0.2 mm (0.008 inch), or earthenware, glass or metal.

3. Each inner receptacle with a removable closure has its closure held securely in place with wire, tape, or other positive means.

4. Unless equivalent cushioning and absorbent material surrounds the inside packaging, each inner receptacle is securely packed in an inside packaging with cushioning and absorbent material that:

   a. Will not react chemically with the material, and
   b. Is capable of absorbing the entire contents (if a liquid) of the receptacle.

5. The inside packaging is securely packed in a strong outside packaging.

6. The completed package, as demonstrated by prototype testing, is capable of sustaining free drops on all sides made from a height of 1.8 meters (5.9 feet) directly onto a solid unyielding surface without breakage or leakage from any inner receptacle and without a substantial reduction in the effectiveness of the package. The package must also sustain a comprehensive load as specified in 49 CFR §178.606(c).

C. The proper container label for each hazardous material is listed in Column Three of Table 2. In general, the prescribed label must be affixed to the package on the same surface and near the marked proper shipping name of the contents. In the case where a material requires more than one label, then only the primary label may show the hazard class at the bottom of the label. Any secondary labels must not show a hazard class designation.

The label may be on a securely attached tag if:

1) the package is smaller than the required label;
2) the package surface is so irregular that a label cannot be affixed to it; or
3) the package is a compressed gas cylinder.

D. In the circumstance where a chemical may not be subject to limited quantity exceptions, such as nitric acid, specification packaging (non-bulk) is described in Table 3. Reference to the proper BBL packaging code for each hazardous material is found in Column Four of Table 2.

E. Placarding requirements do not apply to shipments of hazardous materials that are classified as either small quantities, or limited quantities when they are identified as such on the shipping papers.

With the exception of the following hazard classes:

Explosives 1.1
Explosives 1.2
Explosives 1.3
Poison Gas
Dangerous When Wet
Poison (packing Group 1, inhalation hazard only)
Radioactive

placarding is required only when 454 kilograms (1001 pounds) or more, aggregate gross weight is loaded in a vehicle, an unlikely circumstance with respect to the transportation of field chemicals. In the case of the above listed hazard classes, placarding is required for the transportation of any amount of the material.

6. SHIPPING PAPERS

A. Each person who offers a hazardous material for transportation must describe the hazardous material on the shipping paper (Attachment One) according to the following requirements:

1) When a hazardous material and a material not subject to the requirements of 49 CFR Part 172 are described on the same shipping paper, the hazardous material description entries must be entered:

a. first,
b. in a color that clearly contrasts with any description on the shipping paper of materials not regulated under Part 172, except that a description on a reproduction of a shipping paper may be highlighted, rather than printed, in a contrasting color, or

CLASS NUMBER	DIVISION NUMBER	NAME OF CLASS OR DIVISION	49 CFR REFERENCE FOR DEFINITIONS
None		Forbidden Materials	173.21
None		Forbidden Explosives	173.53
1	1.1	Explosives (with a mass explosive hazard)	173.50
1	1.2	Explosives (with a projection hazard)	173.50
1	1.3	Explosives (with predominantly a fire hazard)	173.50
1	1.4	Explosives (with no significant blast hazard)	173.50
1	1.5	Very insensitive explosives; blasting agents	173.50
1	1.6	Extremely insensitive detonating substances	173.50
2	2.1	Flammable gas	173.115
2	2.2	Non-flammable compressed gas	173.115
2	2.3	Poisonous gas	173.115
3		Flammable and combustible liquid	173.120
4	4.1	Flammable solid	173.124
4	4.2	Spontaneously combustible material	173.124
4	4.3	Dangerous when wet material	173.124
5	5.1	Oxidizer	173.128
5	5.2	Organic peroxide	173.128
6	6.1	Poisonous materials	173.132
6	6.2	Infectious substances (etiologic agent)	173.134
7		Radioactive material	173.403
8		Corrosive material	173.136
9		Miscellaneous hazard material	173.140
None		Other regulated material (ORM-D)	173.144

HAZARDOUS MATERIALS TRAINING REQUIREMENTS

A. All BBL employees involved in packaging, labeling, shipping, and transporting hazardous materials from a BBL office to a project field site, and/or preparing those hazardous materials for transportation, must receive training in accordance with 49 CFR §172.704 (Subpart H), and §177.816 (Drivers).

B. Training to be provided includes General Awareness/Familiarization training, Safety training, Function-specific training, and Driver training. Each category is described below:

General Awareness/Familiarization: This training is designed to familiarize trainees with the general requirements of the HMR, and to enable them to recognize and identify hazardous materials.

Safety: This training includes a review of Subpart G of 49 CFR Part 172, in addition to a review of relevant BBL policies and procedures concerning hazardous chemical handling and storage. This training is accomplished annually in the form of Hazard Communication training either in the HAZWOPER Annual Refresher program, or separately for those employees who are not covered under HAZWOPER.

Function-specific This training includes a review of shipping papers, shipping descriptions, labeling and packaging requirements.

TABLE 1 - LIMITED QUANTITY EXCEPTIONS	
Material	**Limited Quantity Description**
CLASS 8 Hydrochloric acid (PGII) (includes Muriatic acid) Potassium hydroxide (PGII) Sodium hydroxide, solid/liquid (PGII) Sodium hypochlorite (PGIII) Sulfuric acid (PGII)	Limited quantities of corrosive materials (Class 8) in Packing Groups II and III are excepted from labeling, unless offered or intended for transportation by aircraft, placarding, and specification packaging requirements when packaged as described below. The package must not exceed 66 pounds gross weight. The following packages are authorized: 1. PGII, inner packagings not over 1.0 litres (0.3 gallons) net capacity each for liquids; or not over 1.0 kilogram (2.2 pounds) net capacity each for solids; packed in strong outer packagings. 2. PGIII, inner packagings not over 4.0 litres, (1 gallon) net capacity each; or not over 5.0 kilograms (11 pounds) net capacity each for solids; packed in strong outer packagings.
Nitric acid (≤70%, >70%)	**No Limited Quantity exceptions.**
Table 4, Row 1 and 2	Limited quantities of miscelaaneous hazardous materials (Class 9) are excepted from labeling, unless offered or intended for transportation by aircraft, placarding, and specification packaging requirements when packaged as described below. The package must not exceed 66 pounds gross weight. The following packages are authorized: 1. For liquids, inner packagings not over 4.0 L (1 gallon) net capacity each, packed in strong outer packagings. 2. For solids, inner packagings not over 5.0 kg (11 pounds) net capacity each, packed in strong outer packagings.
Alconox, Potassium chloride, Zinc acetate	**Not hazardous materials.**

TABLE 2 - SHIP INFORMATION				
Material	**Proper Shipping Description**	**Labels**	**Packaging Code**	**ERG #**
Acetone	Acetone, 3, UN1090, PGII	Flammable Liquid	1	26
Compressed air	Air, compressed, 2.2, UN1002	Nonflammable Gas	2	12
Diesel fuel	Diesel fuel, 3, NA1993, PGIII		4	27
Fire Extinguishers	Fire extinguishers, 2.2, UN1044	Nonflammable Gas	3	12
Gasoline	Gasoline, 3, UN1203, PGII	Flammable Liquid	1	27
Hexane	Hexanes, 3, UN1208, PGII	Flammable Liquid	1	27
Hydrochloric acid (muriatic)	Hydrochloric acid, solution, 8, UN1789, PGII	Corrosive	1	60
Hydrogen	Hydrogen, compressed, 2.1, UN1049	Flammable Gas	2	22
Isobutane	Isobutane, 2.1, UN1969	Flammable Gas	5	22
Isobutylene	Isobutylene, 2.1, UN1055	Flammable Gas	5	22
Isopropyl alcohol (Isopropanol)	Isopropanol, 3, UN1219, PGII	Flammable Liquid	1	26
Methane	Methane, compressed, 2.1, UN1971	Flammable Gas	2	17
Methyl alcohol (Methanol)	Methanol, 3, UN1230, PGII	Flammable Liquid*	1	28
Nitric acid (> 70% HNO_3)	Nitric acid, 8, UN2031, PGI	Corrosive	6	44
Nitric acid (≤70% HNO_3)	Nitric acid, 8, UN2031, PGII	Corrosive	6	44
Pentane	n-Pentanes, 3, UN1265, PGI	Flammable Liquid	7	27
Potassium hydroixide (liquid)	Potassium hydroxide, solution, 8, UN1814, PGII	Corrosive	1	60
Sodium hydroxide (solid)	Sodium hydroxide, solid, 8, UN1823, PGII	Corrosive	8	60
Sodium hydroxide (liquid)	Sodium hydroxide, solution, 8, UN1824, PGII	Corrosive	1	60
Sodium hypochlorite (>5, ,16%)	Hypochlorite solutions, 8, UN1791, PGIII	Corrosive	4	60
Sulfuric acid	Sulfuric acid, 8, UN1830, PGII	Corrosive	1	39

* For international shipments of methanol, must add poison label.

TABLE 3 - SPECIFICATION PACKAGING

Code	Packaging Requirements			
1	**Per §173.202 the following combination packagings are authorized:**			
	Outer packagings:			
	Steel drum 1A1 or 1A2	Aluminum drum 1B1 or 1B2	Metal drum other steel or aluminum 1N1 or 1N2	Plywood drum 1D
	Fiber drum 1G	Plastic drum 1H1 or 1H2	Wooden barrel 2C2	Steel jerrican 3A1 or 3A2
	Plastic jerrican 3H1 or 3H2	Steel box 4A1 or 4A2	Aluminum box 4B1 or 4B2	Natural wood box 4C1 or 4C2
	Plywood box 4D	Reconstituted wood box 4F	Fiberboard box 4G	Expanded plastic box 4H1
	Solid plastic box 4H2			
	Inner packagings:			
	Glasss or eathenware receptacles	Plastic receptacles	Metal receptacles	Glass ampoules
	Except for transportation by aircraft, the following single packagings are authorized:			
	Steel drum A1A, 1A2	Aluminum drum 1B1	Metal drum other steel or aluminum 1N1 or 1N2	Plastic drum 1H1 or 1H2
	Fiber drum 1G (with liner)	Wooden barrel 2C1	Steel jerrican 3A1 or 3A2	Plastic jerrican 3H1 or 3H2
	Plastic receptacle in steel, aluminum, fiber or plastic drum 6HA1, 6HB1, 6HG1, 6HH		Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2	
	Glass, porcelain or stoneware in steel, aluminum or fiber drum 6PA1, 6PB1, 6PG1		Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG1	
	Glass, porcelain or stoneware in solid or expanded plastic packaging 6PH1, 6PH2		Plastic receptacle in plywood drum 6HD1	
	Glass, porcelain or stoneware in plywood drum or wickerwork hamper 6PD1, 6PD2		Cylinders, specification, as prescribed for any compressed gas, except for specifications 8 and 3HT.	

TABLE 3 - SPECIFICATION PACKAGING

Code	Packaging Requirements			
4	**Per §173.203 the following combination packagings are authorized:**			
	Outer packagings:			
	Steel drum 1A1 or 1A2	Aluminum drum 1B1 or 1B2	Metal drum other steel or aluminum 1N1 or 1N2	Plywood drum 1D
	Fiber drum 1G	Plastic drum 1H1 or 1H2	Wooden barrel 2C2	Steel jerrican 3A1 or 3A2
	Plastic jerrican 3H1 or 3H2	Steel box 4A1 or 4A2	Aluminum box 4B1 or 4B2	Natural wood box 4C1 or 4C2
	Plywood box 4D	Reconstituted wood box 4F	Fiberboard box 4G	Expanded plastic box 4H1
	Solid plastic box 4H2			
	Inner packagings:			
	Glasss or eathenware receptacles	Plastic receptacles	Metal receptacles	Glass ampoules
	The following single packagings are authorized:			
	Steel drum A1A, 1A2	Aluminum drum 1B1, 1B2	Metal drum other steel or aluminum 1N1	Plastic drum 1H1, 1H2
	Fiber drum 1G (with liner)	Wooden barrel 2C1	Steel jerrican 3A1 or 3A2	Plastic jerrican 3H1 or 3H2
	Plastic receptacle in steel, aluminum, fiber or plastic drum 6HA1, 6HB1, 6HG1, 6HH		Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2	
	Glass, porcelain or stoneware in steel, aluminum, wooden or fiber drum 6PA1, 6PB1, 6PG1		Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG2	
	Glass, porcelain or stoneware in solid or expanded plastic packaging 6PH1, 6PH2		Plastic receptacle in plywood drum 6HD1	
	Glass, porcelain or stoneware in plywood drum or wickerwork hamper 6PD1, 6PD2		Cylinders, specification, as prescribed for any compressed gas, except for specifications 8 and 3HT.	

TABLE 3 - SPECI ION PACKAGING				
Code	Packaging Requirements			
7	Per 173.201 the following combination packagings are authorized:			
	Outer Packagings			
	Steel drum 1A1 or 1A2	Aluminum drum 1B1 or 1B2	Metal drum other than steel or aluminum 1N1 or 1N2	Plywood drum 1D
	Fiber drum 1G	Plastic drum 1H1 or 1H2	Steel jerrican 3A1 or 3A2	Plastic jerrican 3H1 or 3H2
	Steel box 4A1 or 4A2	Aluminum box 4B1 or 4B2	Natural wood box 4C1 or 4C2	Plywood box 4D
	Reconstituted wood box 4F	Fiberboard box 4G	Expanded plastic box 4H1	Solid plastic box 4H2
	Inner Packagings			
	Glass or earthenware receptacles	Plastic receptacles	Metal receptacles	Glass ampoules
	Except for transportation by passenger aircraft, the following single packagings are authorized:			
	Steel drum 1A1 or 1A2	Aluminum drum 1B1 or 1B2	Metal drum other than steel or aluminum 1N1 or 1N2	Plastic drum 1H1 or 1H2
	Steel jerrican 3A1 or 3A2	Plastic jerrican 3H1 or 3H2	Plastic receptacle in steel, aluminum, fiber or plastic drum 6HA1, 6HB1, 6HG1, 6HH	
	Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2.		Glass, porcelain or stoneware in steel, aluminum or fiber drum 6PA1, 6PB1, 6PG1.	
	Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG2.		Glass, porcelain or stoneware in solid or expanded plastic packagings 6PH1, 6PH2.	
	Cylinders, specification, as prescribed for any compressed gas, except for Specifications 8 and 3HT.			

TABLE 3 - SPECI	ION PACKAGING		
Bag, paper, multiwall, water resistant 5M2	Steel jerrican 3A1 or 3A2	Plastic jerrican 3H1 or 3H2	
Plastic receptacle in steel, aluminum, plywood fiber or plastic drum 6HA1, 6HB1, 6HD1, 6HG1, 6HH		Plastic receptacle in steel, aluminum, wood, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2.	
Glass, porcelain or stoneware in steel, aluminum, plywood or fiber drum 6PA1, 6PB1, 6PG1.		Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG2.	
Glass, porcelain or stoneware in solid or expanded plastic packagings 6PH1, 6PH2.			

TABLE 4 - HAZAR[illegible] WASTE SAMPLES				
Material	**Proper Shipping Description**	**Labels**	**Packaging Code**	**ERG #**
Soil or sediment contaminated with, or consisting of, a RCRA Hazardous Waste	Environmentally hazardous substances, solid, n.o.s., 9, UN3077, III [Insert EPA Waste Code(s)]	Class 9	9	31
Well or surface water contaminated with, or consisting of, a RCRA Hazardous Waste	Environmentally hazardous substances, liquid, n.o.s., 9, UN3082, III [Insert EPA Waste Code(s)]	**Class 9**	**4**	**31**
For hazardous waste samples consisting of product, such as a solvent, (or in New York, PCBs), etc.	**Contact Regional Health and Safety Coordinator or Corporate Safety Associate.**			

NOTE: As a shipper (one who offers hazardous materials for shipment), we have an obligation to never offer hazardous materials in packages that are not suitable for the material being shipped.

Small Quantity Shipment Example

A BBL employee is required to transport sulfuric acid to a field site to be used as a sample preservative. From Table 1, the employee determines that sulfuric acid is a Class 8 (corrosive) material.

Referring to Section 4.A. of the PPM, the employee determines the following:

1. the maximum quantity per inner receptacle is limited to 30 mL;
2. the container is not liquid full at 131 °F;
3. the container is plastic (minimum 0.2 mm thick) or glass;
4. the container lid is held securely in place;
5. the completed package (inner receptacle and outer package) is capable of sustaining free drops on all sides and a corner from a height of 5.9 feet onto a solid, unyielding surface without breakage or leakage from any inner receptacle;
6. the gross weight of the package does not exceed 64 pounds;
7. the outside package is marked according to Section 4.A.8; and
8. The package is not opened or altered during transportation.

Resolution: The employee packages the sulfuric acid inside 30 mL vials (90% full), and secures the vial lids with tape. The vial(s) are then placed inside an outer packaging (cooler, cardboard box, etc.) and secured with packing material in such a way that the individual containers are not loose, do not touch each other, and are sufficiently protected to comply with the drop requirement listed in number 5, above. The outer package is then marked with the language required in Section 4.A.8. The employee may package as many of the vials as can reasonable fit, without sacrificing requirement number 5. The total package, when complete, must not exceed 64 pounds. Once in transport, the package must not be opened or altered.

With this done, the employee does not need labels, placards, shipping papers, or specification packaging.

Fully-regulated Hazardous Material

A BBL employee is required to transport a hazardous material that cannot be shipped either as a Small or Limited Quantity. One such example is provided on the previous page. Another example could involve the transportation of nitric acid as a sample preservative. If the nitric acid shipment does not meet the small quantity requirements, the employee discovers from Table 1 that nitric acid in any concentration is not subject to limited quantity exceptions.

The employee then refers to Table 2 and locates nitric acid. Note that there are two entries, differentiated by concentration. For our example, let's assume the nitric acid is less than 70%.

The employee notes the proper shipping description from Table 2, and records this on the shipping paper (sample attached). The employee also observes that the package must bear a "corrosive" warning label.

The fourth column in Table 2 directs the employee to packaging code 6 on Table 3. The third row in under packaging code 6 notes that nitric acid in any concentration which does not contain sulfuric or hydrochloric acid as impurities may be packaged in 4H1 expanded plastic outer packaging with glass inner receptacles of not greater than 2.5 litres capacity each. No more than four containers may be packaged in any one individual outer packaging. Because the nitric acid is less than 90% (row 5), the outer packaging can also be 4G fiberboard boxes, or 4C1, 4C2, 4D, or 4F wooden boxes.

In this case, the inner container should be the original container the material was received in. If this is not possible, the inner container must be made of glass and may not exceed 2.5 litres capacity. As for the outer packaging, again the original outer packaging should be used. If it is not available, then it is necessary to contact a packaging supplier and purchase either 4G fiberboard boxes, or one of the approved wooden boxes. Packaging suppliers will recognize the DOT specifications if you refer to them as DOT specification 4G. You should also specify an appropriate size to fit from one up to four inner containers.

Note: The inner containers need not be full. As with limited and small quantities, inner containers need to be secure within the outer packaging.

The completed package must be marked according Section 5.B. with the proper shipping name and the UN/NA Identification number. In this case, the package would be marked:

Nitric acid UN2031

The package would also bear a **"Corrosive"** label on the same face that bore the mark listed above. As with all but small quantity shipments, a shipping paper (attached) must accompany the package during shipment.

APPENDIX B
SAFETY INSPECTION FORM

BBLES DAILY SAFETY MEETING LOG

PROJECT: LOCATION:

DATE/TIME: ACTIVITY:

1. Work Summary	
2. Physical/Chemical Hazards	
3. Protective Equipment/Procedures	
4. Emergency Procedures	
5. Signatures of Attendees	

ATTACHMENT C
MATERIAL SAFETY DATA SHEETS

Genium Publishing Corporation
One Genium Plaza
Schenectady, NY 12304-4690 USA
(518) 377-8854

Section 1. Material Identification

Polychlorinated Biphenyls [$C_{12}H_{10-n}Cl_n$ (n=3, 4, 5)] Description: A class of nonpolar chlorinated hydrocarbons with a biphenyl nucleus (two benzene nuclei connected by a single C-C bond) in which any or all of the hydrogen atoms have been replaced by chlorine. Commercial PCBs are mixtures of chlorinated biphenyl isomers with varying degrees of chlorination. Prepared industrially by the chlorination of biphenyl with anhydrous chlorine in the presence of a catalyst such as ferric chloride or iron filings. Except for limited research and development applications, PCBs have not been produced in the US since 1977. When large quantities of PCBs were manufactured in the US, they were marketed under the tradename Aroclor (Monsanto) and were characterized by four digit numbers. The first two digits indicating biphenyls (12), triphenyls (54), or both (25, 44); the last two digits indicating the weight percent of chlorine. PCBs' thermal stability, nonflammability, and high dielectric capability made them very useful in electrical equipment. Formerly used as additives in hydraulic fluids, heat transfer systems, lubricants, cutting oils, printer's ink, fire retardants, asphalt, brake linings, automobile body sealants, plasticizers, adhesives, synthetic rubber, floor tile, wax extenders, dedusting agents, pesticide extenders, and carbonless reproducing paper. PCBs are still used in certain existing electrical capacitors and transformers that require enhanced electrical protection to avoid heating from sustained electric faults.

R 1
I 4
S 3*
K 1
* Skin absorption

NFPA

HMIS
H 2‡
F 1
R 0
PPE†
† Sec. 8
‡ Chronic Effects

Other Designations: CAS No. 1336-36-3, Aroclor, Clophen, Chlorextol, chlorinated biphenyls, chlorinated diphenyl, chlorinated diphenylene, chloro biphenyl, chloro-1,1-biphenyl, Dykanol, Fenclor, Inerteen, Kaneclor, Montar, Noflamol, Phenoclor, Pyralene, Pyranol, Santotherm, Sovol, Therminol FR-1

Cautions: PCBs are potent liver toxins that may be absorbed through skin. Potentially, chronic or delayed toxicity is significant because PCBs accumulate in fatty tissue and may reasonably be anticipated to be carcinogens. PCBs are a bioaccumulative environmental hazard. When burned, decomposition products may be more hazardous than the PCBs.

Section 2. Ingredients and Occupational Exposure Limits

PCBs, contain various levels of polychlorinated dibenzofurans and chlorinated naphthalenes as contaminants

1991 OSHA PELs, Skin
8-hr TWA (Chlorodiphenyl, 42% chlorine): 1 mg/m^3
8-hr TWA (Chlorodiphenyl, 54% chlorine): 0.5 mg/m^3

1990 DFG (Germany) MAK, Danger of Cutaneous Absorption
TWA (Chlorodiphenyl, 42% chlorine): 0.1 ppm (1 mg/m^3)
Category III: Substances with systemic effects, onset of effect > 2 hr., half-life > shift length (strongly cumulative)
Short-term Level: 1 ppm, 30 min., average value, 1 per shift
TWA (Chlorodiphenyl, 54% chlorine): 0.05 ppm (0.5 mg/m^3)
Category III: (see above)
Short-term Level: 0.5 ppm, 30 min., average value, 1 per shift

1985-86 Toxicity Data*
Rat, oral, TD: 1250 mg/kg administered intermittently for 25 weeks produced liver tumors.
Mammal, oral, TD_{Lo}: 325 mg/kg administered to female for 30 days prior to mating and from the 1st to the 36th day of gestation produced effects on newborn (stillbirth; live birth index; viability index).

1990 NIOSH REL
TWA (Chlorodiphenyl, 42% chlorine): 0.001 mg/m^3
TWA (Chlorodiphenyl, 54% chlorine): 0.001 mg/m^3

1992-93 ACGIH TLVs, Skin *
TWA (Chlorodiphenyl, 42% chlorine): 1 mg/m^3
TWA (Chlorodiphenyl, 54% chlorine): 0.5 mg/m^3

* These guidelines offer reasonably good protection against systemic intoxication, but may not guarantee that chloroacne won't occur.
† See NIOSH, *RTECS* (TQ1350000), for additional reproductive, tumorigenic, andtoxicity data.

Section 3. Physical Data*

Boiling Point: 644-707 °F (340-375 °C)
Melting Point: 42%: -2.2 °F (-19°C); 54%: 14 °F (-10 °C)
Vapor Pressure: 1 mm Hg at 100 °F (38 °C); 10^{-6} to 10^{-3} mm at 20 °C
Molecular Weight: 188.7 to 398.5

Specific Gravity: 1.3 to 1.8 at 20 °C
Water Solubility: Low solubility (0.007 to 5.9 mg/L)
Other Solubilities: Most common organic solvents, oils, and fats; slightly soluble in glycerol and glycols.

Appearance and Odor: PCBs vary from mobile oily liquids to white crystalline solids and hard non-crystalline resins, depending upon chlorine content.

* Physical and chemical properties vary widely according to degree and to the position of chlorination.

Section 4. Fire and Explosion Data

Flash Point: 286-385 °F (141-196 °C) OC*	Autoignition Temperature: 464 °F (240 °C)	LEL: None reported	UEL: None reported

Extinguishing Media: Use extinguishing media suitable to the surrounding fire. Use dry chemical, foam, carbon dioxide (CO_2), or water spray. Water spray may be ineffective. Use water spray to cool fire-exposed containers or transformers. Do not scatter PCBs with high-pressure water streams. **Unusual Fire or Explosion Hazards:** Combustion products (hydrogen chloride, phosgene, polychlorinated dibenzofurans, and furans) are more hazardous than the PCBs themselves. **Special Fire-fighting Procedures:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Approach fire from upwind to avoid highly toxic decomposition products. Structural firefighter's protective clothing will provide *limited* protection. Do not release runoff from fire control methods to sewers or waterways. Dike for later disposal.

* Flash points shown are a range for various PCBs. Some forms do not have flash points.

Section 5. Reactivity Data

Stability/Polymerization: PCBs are very stable materials but are subject to photodechlorination when exposed to sunlight or UV (spectral region above 290 nanometers). Hazardous polymerization cannot occur. **Chemical Incompatibilities:** PCBs are chemically inert and resistant to oxidation, acids, and bases. **Conditions to Avoid:** Avoid heat and ignition sources.
Hazardous Products of Decomposition: Thermal oxidative decomposition [1112-1202 °F (600-650 °C)] of PCBs can produce highly toxic derivatives, including polychlorinated dibenzo-para-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), hydrogen chloride, phosgene and other irritants.

Section 6. Health Hazard Data

Carcinogenicity: The IARC,[164] and NTP[169] list PCBs as an IARC probable carcinogen (overall evaluation is 2A; limited human data; sufficient animal data) and NTP anticipated carcinogen, respectively. **Summary of Risks:** PCBs are potent liver toxins that can be absorbed through unbroken skin in toxic amounts without immediate pain or irritation. PCBs have low acute toxicity, but can accumulate in fatty tissue and severe health effects may develop later. Generally, toxicity increases with a higher chlorine content; PCB-oxides are more toxic. The toxic action on the liver also increases with simultaneous exposure to other liver toxins, e.g. chlorinated solvents, alcohol, and certain drugs. Pathological pregnancies (abnormal pigmentations, abortions, stillbirths, and underweight births) have been associated with increased PCB serum levels in mothers; PCBs can be passed in breast milk. PCBs can affect the reproductive system of adults. **Medical Conditions Aggravated by Long-Term Exposure:** liver, and respiratory disease. **Target Organs:** Skin, liver, eyes, mucous membranes, and respiratory tract. **Primary Entry Routes:** ation, dermal contact, ingestion. **Acute Effects:** Exposure to PCB vapor or mist is severely irritating to the skin, eyes, nose, throat, and upper respiratory tract. Intense acute exposure to high concentrations may result in eye, lung, and liver injury. Systemic effects include nausea, vomiting, increased blood pressure, fatigue, weight loss, jaundice, edema and abdominal pain. Cognitive, neurobehavior and psychomotor impairment and memory loss have also been seen after acute exposure. **Chronic Effects:** Repeated exposure to PCBs can cause chloroacne; redness, swelling, dryness, thickening and darkening of the skin and nails; swelling and burning of the eyes, and excessive eye discharge; distinctive hair follicles; gastrointestinal disturbances; neurological symptoms including headache, dizziness, depression, nervousness, numbness of the extremities, and joint and muscle pain; liver enlargement; menstrual changes in women; and chronic bronchitis. Cancer, primarily liver, is also a possible result of exposure, but data is inconclusive.

FIRST AID Eyes: *Do not* allow victim to rub or keep eyes tightly shut. Rinsing eyes with medical oil (olive, mineral) initially may remove PCB and halt irritation better than water rinsing alone. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately. **Skin:** *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. *Multiple soap and water washings are necessary.* Avoid the use of organic solvents to clean the skin. For reddened or blistered skin, consult a physician. **Inhalation:** Remove exposed person to fresh air and support breathing as needed. **Ingestion:** In most cases, accidental PCB ingestion will not be recognized until long after vomiting would be of any value. Never give anything by mouth to an unconscious or convulsing person. Vomiting of the pure substance may cause aspiration. Consult a physician. **Note to Physicians:** Monitor patients for increased hepatic enzymes, chloroacne, and eye, gastrointestinal, and neurologic symptoms listed above. Diagnostic tests include blood levels of PCBs and altered liver enzymes.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, evacuate all unnecessary personnel, provide adequate ventilation, and isolate hazard area. Cleanup personnel should protect against vapor inhalation and skin or eye contact. For small spills, take up with sand or other noncombustible material and place into containers for later disposal. For larger spills, dike far ahead of spill to contain for later disposal. Follow applicable OSHA regulations (29 CFR 1910.120). **Environmental Transport:** PCBs have been shown to bio-concentrate significantly in aquatic organisms. **Ecotoxicity:** Bluegill, TLm: 0.278 ppm/96 hr. Mallard Duck, LD_{50}: 2000 ppm. **Environmental Degradation:** In general, the persistence of PCBs increases with an increase degree of chlorination. **Soil Absorption/Mobility:** PCBs are tightly absorbed in soil and generally do not leach significantly in most aqueous soil systems. However, in the presence of organic solvents, PCBs may leach rapidly through the soil. Volatilization of PCBs from soil may be slow, but over time may be significant. **Disposal:** Approved PCB disposal methods include: incineration with scrubbing, high-efficiency boilers, landfills, and EPA-approved alternative disposal methods. Each disposal method has various criteria. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

EPA Designations

RCRA Hazardous Waste (40 CFR 261.33): Not listed
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
Listed as a SARA Toxic Chemical (40 CFR 372.65)
Listed as a CERCLA Hazardous Substance* (40 CFR 302.4): Final Reportable Quantity (RQ), 1 lb (0.454 kg) [* per CWA, Sec. 311(b)(4) and 307(a)]

OSHA Designations

Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy. **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. Minimum respiratory protection should include a combination dust-fume-mist and organic vapor cartridge or canister or air-supplied, depending upon the situation. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas. **Other:** Wear chemically protective gloves, boots, aprons, and gauntlets to prevent all skin contact. Butyl rubber, neoprene, Teflon, and fluorocarbon rubber have break through times greater than 8 hrs. **Ventilation:** Provide general and local exhaust ventilation systems to maintain airborne concentrations below the OSHA PEL (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.[103] ***Safety Stations:*** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Separate contaminated work clothes from street clothes and launder before reuse. Segregate contaminated clothing in such a manner so that there is no direct contact by laundry personnel. Implement quality assurance to ascertain the completeness of the cleaning procedures. Remove this material from your shoes and clean PPE. **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in a closed, labelled, container in a ventilated area with appropriate air pollution control equipment. **Engineering Controls:** To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to maintain concentrations at the lowest practical level. **Administrative Controls:** Inform employees of the adverse health effects associated with PCBs. Limit access to PCB work areas to authorized personnel. Consider preplacement and periodic medical examinations with emphasis on the skin, liver, lung, and reproductive system. Monitor PCB blood levels. Consider possible effects on the fetus. Keep medical records for the entire length of employment and for the following 30 yrs.

Transportation Data (49 CFR 172.101)

DOT Shipping Name: Polychlorinated biphenyls
DOT Hazard Class: 9
ID No.: UN2315
DOT Packing Group: II
T Label: CLASS 9
ial Provisions (172.102): 9, N81

Packaging Authorizations
a) **Exceptions:** 173.155
b) **Non-bulk Packaging:** 173.202
c) **Bulk Packaging:** 173.241

Quantity Limitations
a) **Passenger Aircraft or Railcar:** 100 L
b) **Cargo Aircraft Only:** 220 L

Vessel Stowage Requirements
a) **Vessel Stowage:** A
b) **Other:** 34

MSDS Collection **References:** 26, 73, 89, 100, 101, 103, 124, 126, 127, 132, 133, 136, 163, 164, 168, 169, 174, 175, 180
Prepared by: MJ Wurth, BS; **Industrial Hygiene Review:** PA Roy MPH, CIH; **Medical Review:** AC Darlington, MD

Manufactured By:

Product Name: MP-11 Industrial Degreaser/Cleaner

MARWOL PRODUCTS, INC. 709 Erie Blvd. West, Syracuse, NY 13204 315-422-1641

MATERIAL SAFETY DATA SHEET
May be used to comply with
OSHA's hazard communication
dard, 29 CFR 1910.1200

Toxicity 2
Fire 0
Reactivity . . . 0
Personal Protection . . B

PRODUCT NAME: MP-11 Industrial Degreaser/Cleaner
PRODUCT TYPE: Super Strength Degreaser/Detergent
Suppliers Name:
Suppliers Address:
D.O.T. Shipping Class: CORROSIVE LIQUID , NOS. 8 NA-1760 Pg 111

Chemical Family: N/AP
Formula: Proprietary
Phone ( )
. . . . . .
Date: 12/84

SECTION 2 - INGREDIENTS

CHEMICAL NAME	CAS NO.	%	PEL	OSHA STEL	TLV	ACGIH STEL/ CEILING	OSHA OR ACGIH SKIN NOTATION	CARCINOGEN
Water	7732-18-5	to 100	N/A	N/A	N/A	N/A		No
2-Butoxyethanol	111-76-2	0-10	25 ppm	N/A	25 ppm	N/A	Yes	No
Potassium Hydroxide	1310-58-10	0-10	N/A	C2 mg/m³	N/A	C2 mg/m³		No
Amphoteric Surfactant	64972-19-6	0-5	No Listing Found by CAS No.					No
Sodium Metasilicate	6834-92-0	0-5	N/A	N/A	N/A	N/A		No
Sodium Gulcanate	527-07-1	0-5	N/A	N/A	N/A	N/A		No
Nonionic Surfactant	9002-93-1	0-5	N/A	N/A	N/A	N/A		No

SECTION 3 - PHYSICAL DATA

Boiling Point (F): 250°
VaporPres.: Equal to Water
Vapor Density (AIR=1) Equal to Water
Solubility in water: CMP
Evap. Rate (H2)=1) Equal to Water

Specific Gravity: 1.055
Volatiles 82
pH: 13
Odor: Mild Detergent Odor
Appearance: Clear, Thin Liquid

SECTION 4 - FIRE AND EXPLOSION DATA

Flash Point: None to Boiling
Flammable limits: Not Established
Extinguishing Media: None
Special fire fighting procedures: N/A
Fire, explosion hazards: N/A

SECTION 5 - REACTIVITY DATA

lity: Stable
.rdous Polymerization: Will Not Occur
Incompatibility: Acids, Oxidizers
Hazardous Decomposition: Carbon Oxided and Amines

SECTION 6 - STORAGE AND HANDLING

Store Between 40 and 120° F.
For Sale, Use and Storage by Service Personnel Only.

KEEP OUR OF REACH OF CHILDREN

SECTION 7 - HEALTH AND FIRST AID

EYES: May cause eye irritation

EYES: Flush with large amounts of water. Consult a physician if irritation continues.

SKIN: May cause skin irritation

SKIN: Flush with water and apply emollient creme.

INHALATION: May irritate existing bronchial conditions

INHALATION: Seek medical attention if condition worsens.

INGESTION: May cause irritation to the intestine, mouth, throat, & esophagus.

INGESTION: Do not induce vomiting or give any thing by mouth. Consult physician.

SECTION 8 - SPECIAL PROTECTION DATA

Respiratory Protection: Should be used if sprayed
Ventilation: Local
Protective Gloves: Rubber or latex recommended
Eye Protection: Goggles or Safety glasses with shields
Other Precautions: Rubber boots if working in standing solution.

SECTION 9 - SPILL OR LEAK PRECAUTIONS

Steps to be taken in case of spill or leak:
Mop or absorb for disposal. Rinse remaining material to drains. Be cautious of slippery floors.
Waste Disposal Method:
Follow local, state and federal regulations.

- = NON APPLICABLE
N/A = NOT AVAILABLE

CMP = COMPLETE

** AUTHORIZED FOR USE BY U.S.D.A. **

Manufactured By:
MARWOL PRODUCTS, INC. 709 Erie Blvd. West, Syracuse NY 13204 315-422-1641

Product Name: MP-6 Industrial Cleaner

MATERIAL SAFETY DATA SHEET
May be used to comply with
OSHA's hazard communication
standard, 29 CFR 1910.1200

Toxicity 1
Fire 0
Reactivity . . .0
Personal Protection . . B

PRODUCT NAME: MP-6 Industrial Detergent/Cleaner
PRODUCT TYPE: Blended Detergent
Suppliers Name:
Suppliers Address:
D.O.T. Shipping Class: CLEANING COMPOUND NPOI LIQUID

Chemical Family: N/AP
Formula: Proprietary
Phone ( )
Date 3/98

SECTION 2 - INGREDIENTS

CHEMICAL NAME	CAS NO.	%	PEL	OSHA STEL	TLV	ACGIH STEL/ CEILING	OSHA OR ACGIH SKIN NOTATION	CARCINOGEN
Water	7732-18-5	0-100	N/A	N/A	N/A	N/A		No
2-Butoxyethanol	111-76-2	0-5	25 ppm	N/A	25 ppm	N/A	Yes	No
Sodium metasilicate	6834-92-0	0-5	N/A	N/A	N/A	N/A		No
Trisodium Phosphate	7601-54-9	0-5	N/A	N/A	N/A	N/A		No
Potassium Pyrophosphate	7320-34-5	0-5	N/A	N/A	N/A	N/A		No
Oleic Acid	112-80-1	0-5	N/A	N/A	N/A	N/A		No
Octylphenoxpolyethoxyethanol	9002-93-1	0-5	N/A	N/A	N/A	N/A		No

SECTION 3 - PHYSICAL DATA

Boiling Point (F): 212°
VaporPres. (mmhg): Equal to Water
Vapor Density (AIR=1) Equal to Water
Evap. Rate (H2)=1) Equal to water
Solubility in water: CMP

Specific Gravity: 1.075
Volatiles 85
Odor: Mile detergent odor
Appearance: Clear, thin liquid

SECTION 4 - FIRE AND EXPLOSION DATA

Flash Point: N/A (tcp)
Flammable limits: Not Tested
Extinguishing Media: NON FLAMMABLE
Special fire fighting procedures: N/A
Fire, explosion hazards: N/A

SECTION 5 - REACTIVITY DATA

Stability: Stable
Hazardous Polymerization: Will Not Occur
patibility: Acids, Oxidizers
dous Decomposition: Carbon Oxided and Amines

SECTION 6 - STORAGE AND HANDLING

KEEP OUR OF REACH OF CHILDREN
Store between 40 and 120° F

SECTION 7 - HEALTH AND FIRST AID

Threshold Limit Value: Not Established

EYES: May cause eye irritation

SKIN: May cause skin irritation

INHALATION: May irritate existing bronchial conditions.

INGESTION: May cause irritation to the intestine, mouth, throat, & esophagus.

EYES: Flush with large amounts of water. Consult a physician if irritation continues.

SKIN: Thoroughly flush with water and apply emollient creme. If irritation persists, get medical aid.

INHALATION: Seek medical attention if condition worsens.

INGESTION: Do not induce vomiting. Give milk, egg white, gelatin or water. Get immediate medical aid.

SECTION 8 - SPECIAL PROTECTION DATA

Respiratory Protection: None
Ventilation: Local
Protective Gloves: Rubber or latex
Eye Protection: Goggles or Safety glasses recommended

SECTION 9 - SPILL OR LEAK PRECAUTIONS

Steps to be taken in case of spill or leak:
Mop or absorb for disposal
Waste Disposal Method:
Sewer or incinerate with local approval.

SECTION 10 - SPILL OR LEAK PROCEDURES

Steps to Be Taken If Material Is Released or Spilled: Recontainize by mopping, wet vacuum or suitable absorbent. Rinse remaining material to drains. Be cautious of slippery floors.

Waste Disposal Method: Follow local, state, and federal regulations.

The information contained in the MSDS was obtained from current and reliable sources, however, the data is provided without any warranty, expressed or implied, regarding its correctness and accuracy. Since the conditions or handling, storage and disposal of this product are beyond the control of this company, it is not responsible for loss, injury and expense arising out of the products improper use. No warranty is expressed or implied by any statement in this MSDS. Various government agencies may have specific regulations regarding the transportation, handling, storage, use or disposal of this product which may not be covered by this MSDS. The user is responsible for full compliance and safe use of the product.

= NON APPLICABLE CMP = COMPLETE
N/A = NOT AVAILABLE

** AUTHORIZED FOR USE BY U.S.D.A. **
msds\mp-6

Manufactured By:

Product Name: MP-6NP Industrial Degreaser/Cleaner

MARWOL PRODUCTS, INC. 709 Erie Blvd. West, Syracuse, NY 13204 315-422-1641

MATERIAL SAFETY DATA SHEET
May be used to comply with
OSHA's hazard communication
andard, 29 CFR 1910.1200

Toxicity 1
Fire 0
Reactivity . . .0
Personal Protection . . B

PRODUCT NAME: MP-6NP Industrial Degreaser/Cleaner
PRODUCT TYPE: Blended Detergent
Suppliers Name:
Suppliers Address:
D.O.T. Shipping Class: CLEANING COMPOUND NPOI LIQUID

Chemical Family: N/AP
Formula: Proprietary
Phone ( )
Date ~~xxxx~~ 3/98

SECTION 2 - INGREDIENTS

CHEMICAL NAME	CAS NO.	%	PEL	OSHA STEL	TLV	ACGIH STEL/ CEILING	OSHA OR ACGIH SKIN NOTATION	CARCINOGEN
Water	7732-18-5	to 100	N/A	N/A	N/A	N/A		No
2-Butoxyethanol	111-76-2	0-5	25 ppm	N/A	25 ppm	N/A	Yes	No
TetrasodiumEthyleneDiamine Tetra Acetate	64-02-8	0-5	N/A	N/A	N/A	N/A		No
Sodium Metasilicate	6834-92-0	0-5	N/A	N/A	N/A	N/A		No
Octylphenoxpolyethoxyethanol	9002-93-1	0-5	N/A	N/A	N/A	N/A		No
Oleic Acid	112-80-1	0-5	N/A	N/A	N/A	N/A		No
Monoethanolamine	141-43-5	0-5	3 ppm	6 ppm	3 ppm	6 ppm		No

SECTION 3 - PHYSICAL DATA

Boiling Point (F): 212°
VaporPres.: Equal to Water
Vapor Density (AIR=1) Equal to Water
Solubility in water: CMP
Evap. Rate (H2)=1) Equal to Water
Appearance: Clear, Thin Liquid

Specific Gravity: 1.04
Volatiles 85
Odor: Mild Detergent Odor

SECTION 4 - FIRE AND EXPLOSION DATA

Flash Point: None to Boiling
Flammable limits: Not Established
Extinguishing Media: Non Flammable
Special fire fighting procedures: N/A
Fire, explosion hazards: N/A

SECTION 5 - REACTIVITY DATA

Stability: Stable
Hazardous Polymerization: Will Not Occur
Incompatibility: Acids, Oxidizers
Hazardous Decomposition: Carbon Oxided and Amines

SECTION 6 - STORAGE AND HANDLING

KEEP OUR OF REACH OF CHILDREN
Store Between 40 and 120° F.

SECTION 7 - HEALTH AND FIRST AID

EYES: May cause eye irritation

EYES: Flush with large amounts of water. Consult a physician if irritation continues.

SKIN: May cause skin irritation

SKIN: Flush with water and apply emollient creme.

INHALATION: May irritate existing bronchial conditions

INHALATION: Seek medical attention if condition worsens.

INGESTION: May cause irritation to the intestine, mouth, throat, & esophagus.

INGESTION: Do not induce vomiting or give any thing by mouth. Consult physician.

SECTION 8 - SPECIAL PROTECTION DATA

Respiratory Protection: Generally not required
Ventilation: Local
Protective Gloves: Rubber or latex recommended
Eye Protection: Goggles or Safety glasses recommended
Other Precautions: Rubber boots if working in standing solution.

SECTION 9 - SPILL OR LEAK PRECAUTIONS

Steps to be taken in case of spill or leak:
Mop or absorb for disposal
Waste Disposal Method:
Sewer or incinerate with local approval.

N/AP = NON APPLICABLE
N/A = NOT AVAILABLE

CMP = COMPLETE

** AUTHORIZED FOR USE BY U.S.D.A. **

anufactured By: Product Name: ORANGE BLOSSOM

PRODUCTS CHEMICAL COMPANY 2707 Barber Ct Cleveland OH 44113
MERGENCY: phone number involving a spill, leak, fire or accident: INFOTRAC 800-535-5053

RIAL SAFETY DATA SHEET (Prepared According to 29 CFR 1910.1200)

SECTION 1 - PRODUCT IDENTIFICATION — Product Code # 1115

RODUCT NAME:
RODUCT TYPE: ORGANIC DEGREASER
uppliers Name
uppliers Address:
roper Shipping Name: COMPOUND, CLEANING LIQUID, NOS, COMBUSTIBLE NA1993, PG III, (CONTAINS TERPENES)

ph ( )

HMIS Rating: Health ... 2; Fire ..... 2; Reactivity 0; Personal Protection: B

Formula: Propriatary

SECTION 2 - INGREDIENTS — Revision Date: 02/95

CHEMICAL NAME	CAS NO.	%WT	313/CHEM	PEL	TWA-TLV	CARCINOGEN
ITRUS TERPINE	68647-72-3	75 - 80	no			NO
BUTOXYETHANOL	111-76-2	25 - 30	no	25	25	NO
NIONIC SURFACTANT	26264-05-1	0 - 5	no			NO
YE	N/A	0 - 5	no			NO
YE	N/A	0 - 5	no			NO
ERFUME OIL	N/A	0 - 5	no			NO

OTE: ingredients not toxic under Section 313 of Title III, (SARA) and 40 CFR Part 373

SECTION 3 - PHYSICAL DATA

iling point(f) 350. Specific Gravity .85
rPres.(mmhg) 20@68F Volatiles 100.00
rDensity (AIR=1)N/A pH 6.00
olubility in water: CMP Evap.Rate (H20=1) 1-1

ppearance/odor: ORANGE LIQUID/ORANGE

SECTION 4 - FIRE AND EXPLOSION DATA

Flash point: 122. (tcp)
Flammable limits: 6.0 uel 1.0 lel
Extinguishing Media: DRY CHEMICAL,CO2,HALON
Special fire procedures: DO NOT USE WATER
Fire,explosion hazards: HEATED DRUMS CAN EXPLODE

SECTION 5 - REACTIVITY DATA

ability: STABLE
Hazardous Polymerization: WILL NOT OCCUR
ncompatibility: NONE KNOWN
zardous Decomposition: NONE KNOWN

SECTION 6 - STORAGE AND HANDLING

KEEP OUT OF THE REACH OF CHILDREN
For sale to, use & storage by trained persons only

SECTION 7 - HEALTH AND FIRST AID

ES: May cause severe eye irritation.Prolonged contact may cause permanent eye damage

IN: May cause severe skin irritation. Prolonged contact may cause burns,redness

INHALATION: May be irritating to mucous membranes in nose, throat, lungs, choking, coughing, headache may occur.

GESTION: May cause irritation to the digestive, tract. Vomiting and diarrhea expected with large doses.

EYES: Flush with large amounts of water. Consult a physician if irritation continues

SKIN: Flush with large amounts of water.Remove contaminated clothes.Seek medical attention

INHALATION: Seek fresh air.

INGESTION: Induce vomiting. Drink large quantities of water. Immediately Seek medical attention.

SECTION 8 - SPECIAL PROTECTION DATA

iratory Protection: Adequate ventilation
ilation: As required to maintain TLV
ective Gloves: Rubber gloves recommended
e Protection: Safety glasses recommended.

A = Not applicable CMP = Complete

SECTION 9 - SPILL OR LEAK PRECAUTIONS

Steps to be taken in case of spill or leak:
Mop or absorb for disposal
Waste disposal Method:
Sewer or incinerate with local approval.

** U.S.D.A. Listed - Consult label

END of GENERATE ..

ATTACHMENT D
DAILY AIR MONITORING LOG

DAILY AIR MONITORING LOG

Project: **Date:**

Monitoring Instruments:

Air Monitor: **Activity:**

Level of Protection:

Time	Location	Instrument Reading	Comments

ATTACHMENT E
DAILY SAFETY MEETING LOG

BBLES DAILY SAFETY MEETING LOG

PROJECT: LOCATION:

DATE/TIME: ACTIVITY:

1. Work Summary
2. Physical/Chemical Hazards
3. Protective Equipment/Procedures
4. Emergency Procedures
5. Signatures of Attendees

ATTACHMENT F
ACCIDENT INVESTIGATION REPORT

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

ACCIDENT INVESTIGATION REPORT

Date of Report _____ Date of Accident _____ Time of Accident _____

Employee's Name _____ Title _____

Address _____ Employee # _____

City _____ State _____ Zip Code _____

Age _____ Sex _____ Marital Status _____

Date of Hire _____ Social Security # _____ # of Dependents _____

Description of Accident: _____

_____

_____

Description of Injuries: _____

_____

_____

Witnesses: _____

Injuries Required:

☐ First Aid (At Scene) ☐ Emergency Room Treatment ☐ Hospitalization

Location of Accident _____

First Aid Provided By _____

Medical Facility/Address _____

Attending Physician _____

Did Employee Return to Work? Did Employee Lose Time at Work?

☐ Yes ☐ No if Yes, Give Date ☐ Yes ☐ No If Yes, Give Amount

Actions or Conditions Causing Accident: _____

_____

Corrective Actions: _____

_____

Further Comments: _____

_____

Employee Signature _____ Date _____

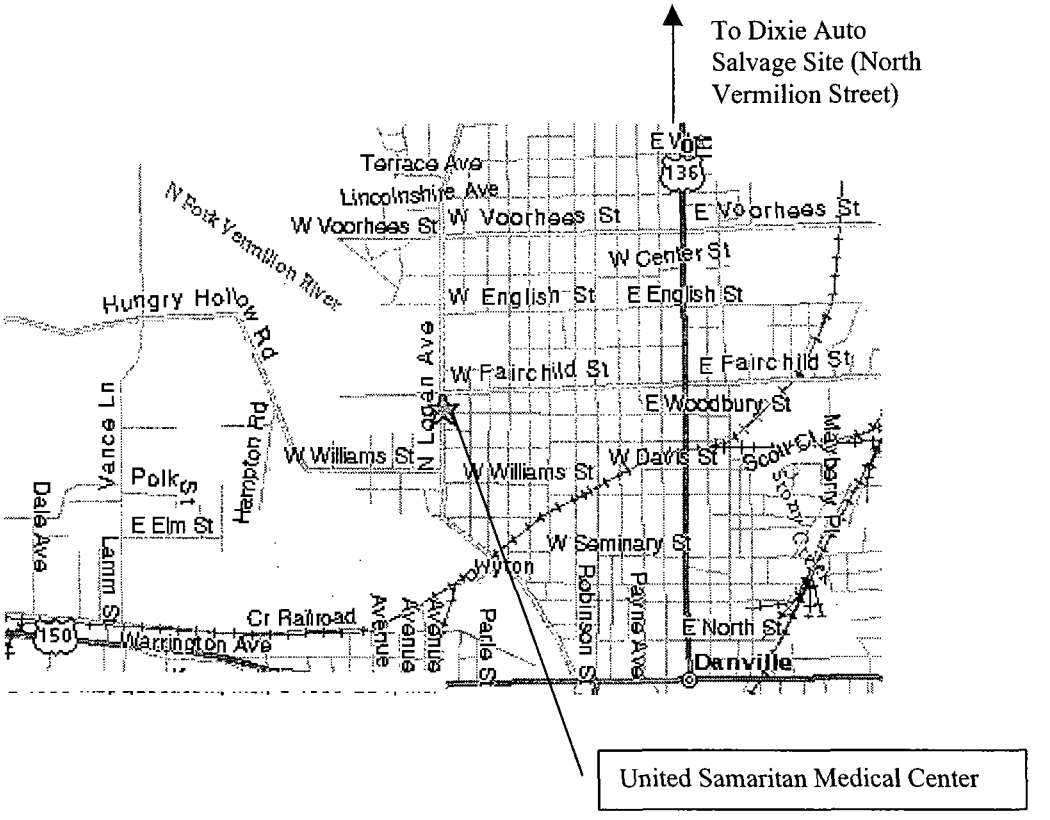
H&S Review _____ Date _____

3/2/00
U:\LUKE\PROJECT\GEDANSVI\HASP.APP

ATTACHMENT G
HOSPITAL ROUTE

Emergency Medical Services
United Samaritan Medical Center
812 North Logan Avenue

(217) 443-5221

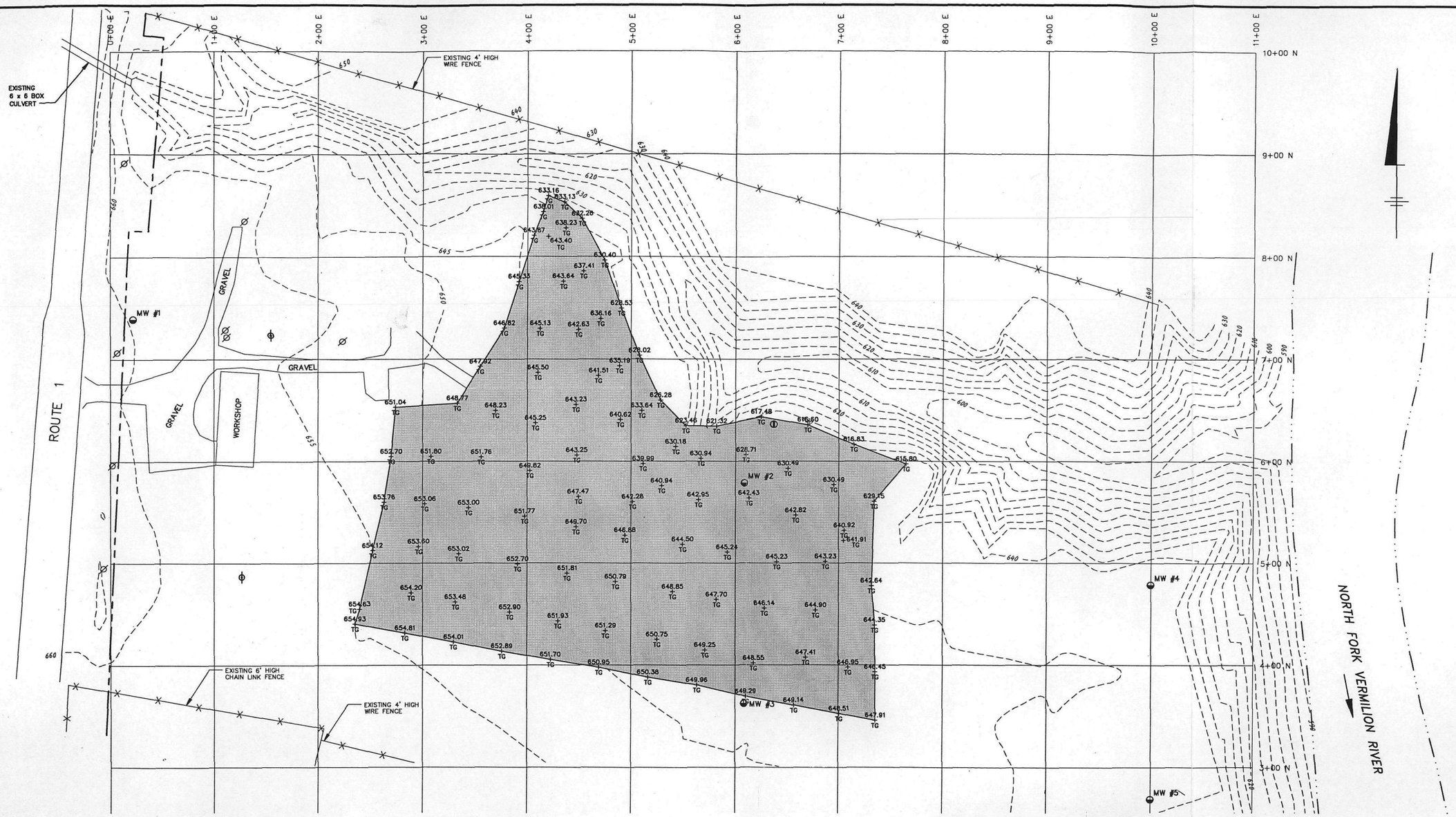


Direction to Medical Center From Site:

- Take left onto Route 1 South.
- Proceed for approximately 5 miles
- Take right onto East Woodbury Street
- Follow to T in Road (0.75 miles) North Logan Street.
- United Samaritan Medical Center is at the corner of East Woodbury Street and North Logan Street.

Appendix F – Final Site Survey

BBL ENVIRONMENTAL SERVICES, INC.



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- 660 EXISTING ELEVATION CONTOUR
- APPROXIMATE EDGE OF WATER
- 652.70 TG TOP OF HDPE GEOMEMBRANE (SEE NOTE 1)
- APPROXIMATE LIMIT OF HDPE GEOMEMBRANE
- MW #5 APPROXIMATE MONITORING WELL LOCATION
- APPROXIMATE LOCATION OF LEACHATE COLLECTION MANHOLE

NOTES:

1. AS-BUILT ELEVATIONS SHOWN REPRESENT TOP OF HDPE GEOMEMBRANE.
2. ELEVATION DATA AND MONITORING WELL LOCATIONS OBTAINED FROM FIELD SURVEY PERFORMED BY BERNS, CLANCY AND ASSOCIATES, P.C., URBANA, IL, DATED 6/99.
3. LOCATION OF LEACHATE COLLECTION MANHOLE IS APPROXIMATE BASED ON FIELD NOTES RECORDED BY ON-SITE BBL PERSONNEL.

X: 84002X02.DWG
L: ON=*, OFF=REF*
: STD-PCP/DL
/31/00 SYR-54-JER PGL KMD
84002001/84002G04.DWG

Graphic Scale: 50' 0 50' 100'

No.	Date	Revisions	Init
1	3/28/00	MISC. SITE FEATURES ADDED/REMOVED	

Project Mgr. LWM
Designed by PHB
Drawn by JER, YCC, GMS, PGL
Checked by LWM
Prof. Eng. _____
PE License _____

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

DIXIE AUTO SALVAGE SITE • DANVILLE, ILLINOIS
REMEDIAL ACTION IMPLEMENTATION PLAN

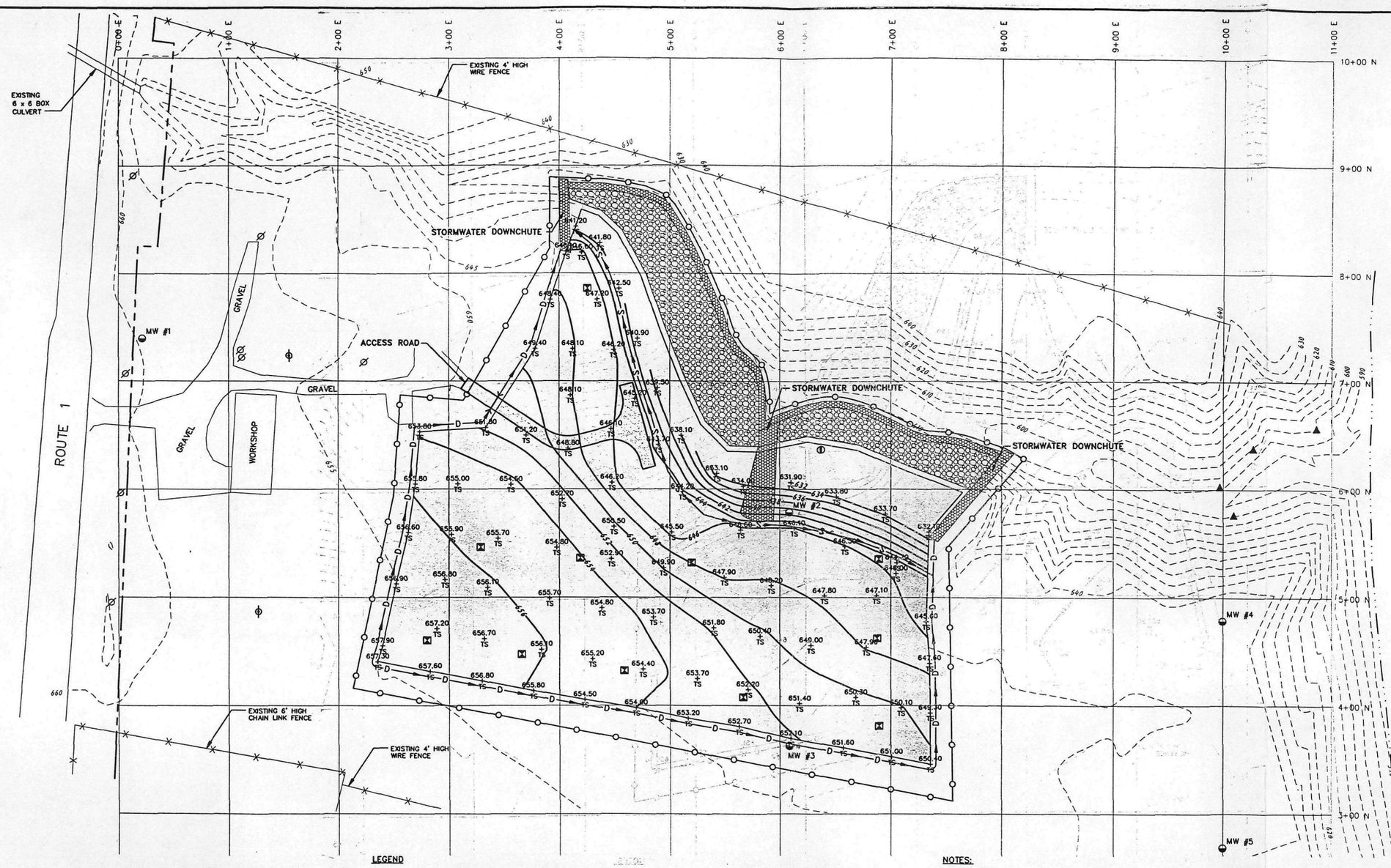
AS-BUILT TOP OF GEOMEMBRANE

GENERAL

File Number 84002.002
Date MARCH 1999

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

1



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- 660 EXISTING ELEVATION CONTOUR
- APPROXIMATE EDGE OF WATER
- 650.75 TS TOPSOIL ELEVATION (SEE NOTE 1)
- APPROXIMATE AREA OF TOPSOIL GRADING
- 656 AS-BUILT TOPSOIL ELEVATION CONTOUR
- APPROXIMATE PERIMETER FENCE LINE
- MW #5 APPROXIMATE MONITORING WELL LOCATION
- APPROXIMATE LOCATION OF LEACHATE COLLECTION MANHOLE
- APPROXIMATE LOCATION OF BIRDHOUSE
- APPROXIMATE LOCATION OF BATHOUSE
- D PERIMETER DRAINAGE DITCH
- S MID-SLOPE DRAINAGE SWALE
- RENO MATTRESS
- RIPRAP

NOTES:

1. AS-BUILT ELEVATIONS SHOWN REPRESENT TOP OF TOPSOIL LAYER.
2. ELEVATION DATA AND MONITORING WELL LOCATIONS OBTAINED FROM FIELD SURVEY PERFORMED BY BERNS, CLANCY AND ASSOCIATES, P.C., URBANA, IL, DATED 7/99.
3. LOCATIONS OF LEACHATE COLLECTION MANHOLE, BIRDHOUSES, BATHOUSES, AND STORMWATER DOWNCHUTES ARE APPROXIMATE BASED ON FIELD NOTES RECORDED BY ON-SITE BBL PERSONNEL.

X: 84002X01.DWG
L: ON=*, OFF=REF*
P: STD-PCP/DL
3/31/00 SYR-JER PGL KMD
84002001/84002G03.DWG

Graphic Scale
50' 0 50' 100'

No.	Date	Revisions	Init
1	3/28/00	MISC. SITE FEATURES ADDED/REMOVED	

Project Mgr. LWM
Designed by PHB
Drawn by JER, GMS, MDP, PGL
Checked by LWM
Prof. Eng.
PE License

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

DIXIE AUTO SALVAGE SITE • DANVILLE, ILLINOIS
REMEDIAL ACTION IMPLEMENTATION PLAN

AS-BUILT TOPSOIL LAYER

GENERAL

File Number 84002.002
Date MARCH 2000

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

2