

REMEDIAL INVESTIGATION/INTERIM REMEDIAL MEASURE DESIGN

WORK PLAN

WORK ASSIGNMENT D003825-26

FORMER DINABURG DISTRIBUTING, INC.
CITY OF ROCHESTER (C)

SITE NO. 8-28-103
MONROE COUNTY, NY

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York

John P. Cahill, Commissioner

DIVISION OF ENVIRONMENTAL REMEDIATION

URS Corporation
282 Delaware Avenue
Buffalo, New York 14202

Final
September 2000

G3223A

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FINAL

Prepared By:

URS CORPORATION
282 DELAWARE AVENUE
BUFFALO, NEW YORK 14202

SEPTEMBER 2000

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PART A

FIELD SAMPLING PLAN
(FSP)

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A1.0 INTRODUCTION

This Field Sampling Plan (FSP) is designed to provide detailed, step-by-step procedures for the field activities outlined in the Project Management Plan for the Remedial Investigation (RI) / Interim Remedial Measure Design at the former Dinaburg Distributing, Inc. Site. It will serve as the field procedures manual to be strictly followed by all URS personnel. Adherence to these procedures will ensure the quality and defensibility of the data collected in the field. In addition to the field procedures outlined in this document, all personnel performing field activities must do so in compliance with: (1) the Quality Assurance/Quality Control measures outlined in Part B; (2) the appropriate Health and Safety guidelines found in the Health and Safety Plan (Part C); and (3) the scope of work and schedule, outlined in the Project Management Work Plan.

A2.0 MOBILIZATION

A mobile, temporary decontamination pad will be constructed near the site entrance to decontaminate vehicles/heavy equipment/drill rigs entering and leaving the site. The decontamination area will be large enough to allow the storage of cleaned equipment and materials prior to use. Drums of decontamination fluids and investigation-derived wastes will be stored on pallets covered with plastic sheeting near the decontamination area.

Proposed well and sampling locations will be marked with paint or staked, labeled, and flagged prior to drilling. Utilities in areas designated for intrusive activities will be cleared through the Underground Facilities Protective Organization (UFPO). In addition, a utility locating subcontractor will conduct a survey to locate all buried utilities at the site. Monroe County Pure Waters will be contacted to assist in the locating all storm and sanitary sewers.

A3.0 SOIL GAS SURVEY

A soil gas survey will be conducted at the site to qualitatively determine the presence of volatile organic contaminants in site soils within the vadose zone. Information obtained from the soil gas survey will be used to assist in the location of soil samples and soil borings.

A.3.1 Sampling Locations

Approximately 75 soil gas borings will be advanced across the grid network shown in Figure A3-1. Borings will generally be advanced downward to the water table or refusal near the center of each block within the grid. However, boring locations will be adjusted as necessary to avoid conflicts with buildings, utilities, etc. If soil gas levels are significantly elevated at the outer limits of the grid network, then the grid will be extended as necessary and practical to "sample to clean".

A.3.2 Screening Procedures

The soil gas will be screened with a Total Vapor Analyzer (TVA) throughout the unsaturated overburden soil column, anticipated to be up to 16 feet thick.

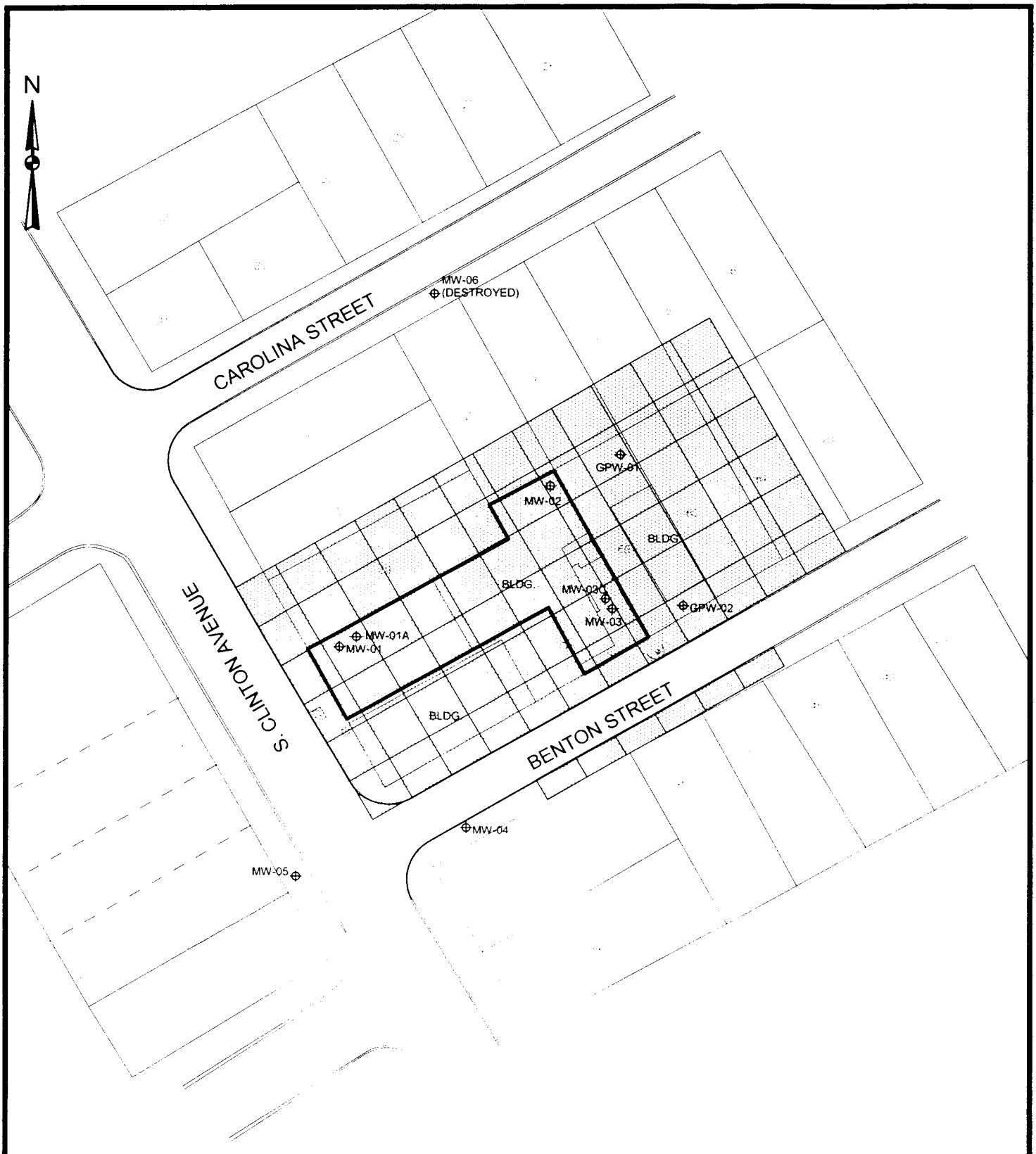
Procedure

1) At each sample location the probe is advanced in 2-foot intervals into the subsurface by pneumatic hammer, or hydraulic press using a Geoprobe.
2) At each interval, a soil gas sample will be collected.
3) Each soil gas sample will be analyzed using a portable TVA.

A3.3 Reports and Forms

A field notebook to record the soil gas survey results will be initiated at the start of on site work and maintained by the Field Geologist. The field notebook will include the following daily information regardless of what activity is being performed:

1. Date
2. Meteorological conditions
3. Crew members
4. Brief descriptions of proposed field activities
5. Locations where work is performed
6. Problems and corrective actions taken
7. All field measurements or descriptions recorded
8. Calibration of field equipment used
9. All modifications of the FSP



Legend

- ⊕ Existing Monitoring Well
- 46 Tax Assessment #

NOTES:
(1) Actual grid may be adjusted in the field due to site conditions.
(2) Approximately 25 Soil Samples will be collected from 20 Geoprobe soil borings advanced at selected grid nodes based upon the soil gas screening results.

60 0 60 Feet

URS Greiner Woodward Clyde	FORMER DINABURG DISTRIBUTING PROPOSED SOIL GAS SCREENING LOCATIONS	FIGURE A3-1

J:\35798.01\dbg\s\site apr PROPOSED SOIL BORING LOCATION GRID 9/25/2000

A4.0 SUBSURFACE INVESTIGATION

A4.1 General Drilling Program

The subsurface investigation program will provide information which will assist in geologic, geotechnical, hydrogeological, and chemical site interpretations. Borings and monitoring wells are proposed as part of the subsurface program. Approximately twenty Geoprobe soil boring locations will be advanced and the locations will be based on the results of the soil gas survey. To define the area and limit of contamination, soil borings will be made at both perimeter locations and locations within the contaminant plume. The final monitoring well locations will be selected based upon the results of previous groundwater sampling.

The following are applicable investigation and monitoring well installation procedures, and the appropriate sections where they are discussed are as follows:

- Geoprobe direct push procedure (Section A4.2)
- Hollow-stem auger drilling procedure (Section A4.3)
- Split-spoon sampling procedure (Section A4.4)
- NX -coring procedure (Section A4.5)
- Wash-rotary drilling procedure (Section A4.6)
- Disposal of drill cuttings (Section A4.7)
- Plugging/abandonment of borehole procedures (Section A4.8)
- Interface well construction procedures (Section A4.9)
- Overburden well/piezometer construction procedures (Section A4.10)
- Recovery well construction procedures (Section A4.11)
- Well development procedures (Section A4.12)
- Documentation (Section A4.13);

A4.2 Geoprobe Direct Push Procedure

Procedure

1) Inspect the sampling equipment to ensure proper working condition.

2) Select additional components for the sampler as required (i.e., leaf spring core retainer for clays, or a sand trap for non-cohesive sands).

3) Lower the sampler to the ground surface, or bottom of the hole previously made by the sampler, and check the depth against length of the rods and the sampler.

4) Attach the drive head assembly to the sample rods.

5) Push the sampler in 4-foot increments into the subsurface up to the desired depth with a hydraulic press.

6) Rotate the sampling rods clockwise and remove the sampler.

7) One sample will be collected from each boring for chemical analysis. Extrude the sample, describe the soil, and collect any necessary samples into appropriate containers and label the containers (Section A9.0). The sample will be collected from the depth interval with obvious soil staining or the highest organic vapor concentration.

8) Document all soil descriptions and sample information in the field notebook.

9) Sample containers will be labeled as described in Section A9.0 and shipped to the laboratory under the chain-of-custody as described in Section A10.0

10) Abandon the Geoprobe hole by backfilling with unused sample and top off the borings with bentonite pellets and hydrate with potable water or use concrete patch in impervious areas.

A4.3 Hollow-Stem Auger Drilling Procedure

A hollow-stem auger (HSA) drilling is a standard method of subsurface drilling which enables the recovery of representative subsurface samples for identification and laboratory testing.

Procedure

1) Advance the boring by rotating and advancing the augers the desired distance into the subsurface. The borings will be advanced incrementally to permit continuous or intermittent sampling as required.

2) Remove center plug from augers and sample subsurface per method stipulated by the project geologist or hydrogeologist. Sampling methods are presented in Section A4.4.

Reference: American Society of Testing Materials (ASTM), "Standard Practice for Soil Investigation and Sampling by Auger Borings," Standard D1452-80.

A4.4 Split-Spoon Sampling Procedures

Split-spoon sampling is a standard method of soil sampling to obtain representative samples for identification and laboratory testing as well as to serve as a measure of resistance of soil to sampler penetration.

Procedure

1) Measure the sampling equipment lengths to ensure that they conform to specifications. Confirm the weight of the hammer (140 pounds).

2) Clean out the auger flight to the bottom depth prior to sampling. Select additional components as required (i.e., leaf spring core retainer for clays or a sand trap for non-cohesive sands).

3) Lower the sampler to the bottom of the auger column and check the depth against length of the rods and the sampler.

4) Attach the drive head sub and hammer to the drill rods without the weight resting on the rods.

5) Lower the weight and allow the sampler to settle up to 6 inches. If it settles more, consider using another sampler.

6) Mark four 6-inch intervals on the drill rods relative to a drive reference point on the rig. With the sampler resting on the bottom of the hole, drive the sampler with the 140 pound hammer falling freely over its 30-inch fall until 24 inches have been penetrated or 100 blows applied.

7) Record the number of blows per 6 inches. Determine the "N" value by adding the blows for the 6- to 12-inch and 12- to 18-inch interval of each sample attempt.

8) After penetration is complete, remove the sample.

9) Open sampler and describe the soil.

10) Document all properties and sample locations in the field notebook and later on the Boring Log form (Figure A4-1).

Reference: ASTM "Standard Method for Penetration Test and Split Barrel Sampling of Soils, Standard D1586-84.

A4.4.1 Unified Soil Classification System

Soils are classified for engineering purposes according to the Unified Soil Classification System (USCS) adopted by the United States Army Corps of Engineers and United States Department of the Interior Bureau of Reclamation. Soil properties which form the basis for the USCS are:

- Percentage of gravel, sand, and fines
- Shape of the grain-size distribution curve
- Plasticity and compressibility characteristics

According to this system, all soils are divided into three major groups: coarse-grained, fine-grained, and highly-organic (peaty). The boundary between coarse-grained and fine-grained soils is taken to be the 200-mesh sieve (0.074 millimeters). In the field, the distinction is based on whether the individual particles can be seen with the unaided eye. If more than 50 percent of the soil by weight is judged to consist of grains that can be distinguished separately, the soil is considered to be coarse-grained.

The coarse-grained soils are divided into gravelly (G) or sandy (S) soils, depending on whether more or less than 50 percent of the visible grains are larger than the No. 4 sieve (3/16 inch). They are each divided further into four groups:

W: Well graded; fairly clean (less than 5 percent finer than 0.074 mm)

P: Poorly graded (gap-graded); fairly clean (less than 5 percent finer than 0.074 mm)

C: Clayey (greater than 12 percent finer than 0.074mm); plastic (clayey) fines. Fine fraction above the A-line with plasticity index above 7.

FIGURE A4-1
BORING LOG FORM

URS Corporation									TEST BORING LOG	
									BORING NO:	RH-GW-001
PROJECT:		Former Dinaburg Distributing, Inc.							SHEET:	1 of 1
CLIENT:		NYSDEC							JOB NO.:	35798
BORING CONTRACTOR:		Buffalo Drilling Company							BORING LOCATION:	
GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE	GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE	TYPE					DATE STARTED:	
				DIA.					DATE FINISHED:	
				WT.					DRILLER:	
				FALL					GEOLOGIST:	Scott McCabe
				* POCKET PENETROMETER READING					REVIEWED BY:	

	SAMPLE					DESCRIPTION			
DEPTH FEET	TIME	NO.	TYPE	BLOWS PER 6"	RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	REMARKS
5									
10									
15									
20									
25									
30									

COMMENTS:
Installed a 2-inch PVC well with a ten-foot screened interval.

PROJECT NO. 35798
BORING NO. MW-08

M: Silty (greater than 12 percent finer than 0.074 mm); nonplastic or silty fines. Fine fraction below the A-line and plasticity index below 4.

The soils are represented by symbols such as GW or SP. Borderline materials are represented by a double symbol, as GW-GC.

The fine-grained soils are divided into three groups: inorganic silts (M), inorganic clays (C), and organic silts and clays (O). The soils are further divided into those having liquid limits lower than 50 percent (L), or higher than 50 percent (H). The distinction between the inorganic silts (M), the inorganic clays (C), and organic soils (O) is made on the basis of a modified plasticity chart. Soils CH and CL are represented by points above the A-line, whereas soils OH, OL, and MH correspond to positions below the A-line. Soils ML, except for a few clayey fine sands, are also represented by points below the A-line. The organic soils O are distinguished from the inorganic soils M and C by their characteristic odor and dark color.

A4.4.2 Visual Identification

Soil properties required to define the USCS classification of a soil are the primary features to be considered in field identification. These properties and other observed characteristics normally identified in describing a soil are defined below:

- Color
- Moisture conditions
- Grain size
  - Estimated maximum grain size
  - Estimated percent by weight of fines (material passing No. 200 sieve)

- Gradation
- Grain shape
- Plasticity
- Predominant soil type
- Secondary components of soil
- Classification symbol
- Other features such as:
  - organic, chemical, or metallic content
  - compactness
  - consistency
  - cohesiveness near plastic limit
  - dry strength
  - source - residual, or transported (aeolian, water borne, glacial deposit, etc.)

A4.5 NX-Coring Procedure

NX-Coring are standard methods of subsurface drilling which enables the recovery of bedrock cores for identification.

Procedure

1) Advance the boring into the bedrock by core drilling using a NX-size, double-tube, swivel-type core barrel. Continue drilling until core blockage occurs or until the net length of the core barrel has been drilled.

2) Remove the core barrel from the hole and disassemble it as necessary to remove the core. Reassemble the core barrel and return it to the hole. Resume coring.

3) Place recovered core in the core box with the upper (surface) end of the core at the upper-left corner of the core box. Fit fractured, bedded, or jointed pieces of core together as they naturally occurred.

4) Cable core box with borehole ID, date, time, and depth interval of core.

5) The following observations will be recorded from the rock core:

a) Core recovery percent

b) Color

c) Rock classification

d) Rock hardness

e) Rock fractures, including descriptions of natural breaks

f) Rock Quality Designation (RQD)

$$RQD = \frac{\text{Sum of core lengths} > 4\text{"/run} \times 100}{\text{Total length of core run}}$$

Reference: ASTM, "Standard Practice for Diamond Core Drill for Site Investigation," Standard D2113-83 (1987)

A4.6 Wash Rotary Drilling Procedure

Wash rotary drilling is a method of subsurface drilling wherein a drilling fluid (water in this case) is circulated through the drill string to wash cuttings out of the borehole and lubricate drilling tools.

Procedure

1) Connect drilling water supply pump to drill string.
2) Advance the boring by spinning the drill bit the desired distance into the subsurface.
3) Use a recirculating system to collect and separate cuttings rising out of the borehole.
4) Note rate of drilling and volume of water lost down the borehole.

A4.7 Disposal of Drill Cuttings

Drill cuttings will be disposed of in accordance with New York State Department of Environmental Conservation (NYSDEC) *Technical and Administrative Guidance Memorandum* (TAGM) HWR-89-4032, November 21, 1989.

Procedure

1) Cuttings will be stored/disposed on site in 55-gallon drums.

2) If pure wastes are present in the cuttings, the material shall be sampled and analyzed to ensure chemical compatibility with other cuttings before placing the materials in a common storage or disposal area.

3) Drill cuttings generated near or adjacent to the site will be collected and transported to the site for disposal.

4) If materials are found to be hazardous, cuttings will be disposed of off site at a properly permitted treatment, storage or disposal facility.

A4.8 Plugging/Abandoning Borehole Procedures

Boreholes that are not completed as monitoring wells will be sealed (plugged) prior to abandonment to prevent downhole contamination. Sealing can be achieved by backfilling the borehole with bentonite below the water table and/or with a cement/bentonite grout above the water table. The backfill material will be introduced from bottom to top using either a tremie pipe or the drill rods.

Procedure

1) Determine most suitable seal materials. Grout specifications generally have mixture ratios as follows:

Grout Slurry Composition (Percent Weight)

1.5 to 3.0 percent - Bentonite (Quick Gel)
40 to 60 percent - Cement (Portland Type I)
40 to 60 percent - Water

2) Calculate the volume of the borehole based on the bit or auger head diameter plus 10 percent and determine the volume of grout to be emplaced. Generally, the total mixed volume is the borehole volume plus 20 percent.

3) Identify the equipment to be used for preparing and mixing of the grout. Ensure the volume of the tanks to be used for mixing has been measured adequately. Document these volumes.

4) Identify the source of the water to be used for the grout and determine its suitability for use. In particular, water with high sulfate or chloride levels, or heated water, should not be used. These types of waters can cause operational difficulties or modify the set-up for the grout.

5) Identify the equipment to be used for emplacing the grout. Ensure that the pump to be used has adequate pressure to enable complete return to surface.

6) Identify the volumes to be pumped at each stage or in total if only one stage is to be used.

7) Prepare the borehole plugging plan and discuss the plan and activities with the drilling contractor prior to beginning any mixing activities.

8) Begin mixing the grout to be emplaced.

9) Record the type and amount of materials used during the mixing operation. Ensure that the ratios are within specification tolerance.

10) Begin pumping the grout through the return line bypass system to confirm that all pump and surface fittings are secure.

11) Initiate downhole pumping. Record the times and volumes emplaced on the form.

12) Document the return circulation of grout. This may be facilitated by using a colored dye or other tagging method if a mudded borehole condition exists prior to grout injection.

13) Clear and clean the surface near the borehole. Level the ground to about the pre-existing grade. Add grout or cement as necessary to the area near the borehole.

Note: On occasion, there may be some settling of the grout which takes place over several days. If this settling occurs, the natural soil from the immediate vicinity are used to put the level at grade. A follow-up check at each site should be made within one week to 10 days of completion. Document the visit and describe any action taken.

A4.9 Interface Well Construction Procedures

The monitoring well network will conform to the program and design specifications set forth in the Project Management Work Plan.

Five monitoring wells will be installed at the overburden/bedrock interface, and will be screened from approximately 16 feet to 26 feet below ground surface. Constructing monitoring wells at the bedrock interface allows for the collection of groundwater samples and groundwater elevations.

Procedure

1) Collect split-spoon soil samples at two foot increments while advancing 4¼-inch ID HSAs to the top of bedrock. Follow the procedure in Section A4.4. Split-spoon samples will be collected only at the interface well borings.

2) Remove the center plug from the augers and measure the depth to the top of bedrock from the ground surface using a weighted measuring tape.

3) At these boring locations collect a 1-foot NX- rock core sample anticipated to be up to 26 feet below ground surface.

4) Add sand to the screened section of the well and slowly remove the augers. The sand pack should extend at least 2 feet above the top of the well screen. Measure with a weighted measuring tape to ensure the sand pack has been installed accurately.

5) Slowly add bentonite pellets into the borehole and continue to slowly remove the augers. The bentonite seal should extend at least 2 feet above the sand pack. Measure with a weighted measuring tape.

Note: The rate of removal of the augers from the borehole should closely follow the rate that the sand pack and bentonite pellets fill the borehole.

6) Hydrate the bentonite pellets with water and let set for 30 minutes.

7) Mix cement/bentonite grout per the specifications presented in Section 4.8.

8) Add the grout to the borehole via a tremie pipe or hose. Fill the borehole to 2 feet below the ground surface.

9) Backfill the remaining 2 feet of the borehole with concrete.

10) Cut the well riser pipe just below the ground surface and install protective flush-mount casing into the concrete around riser pipe.

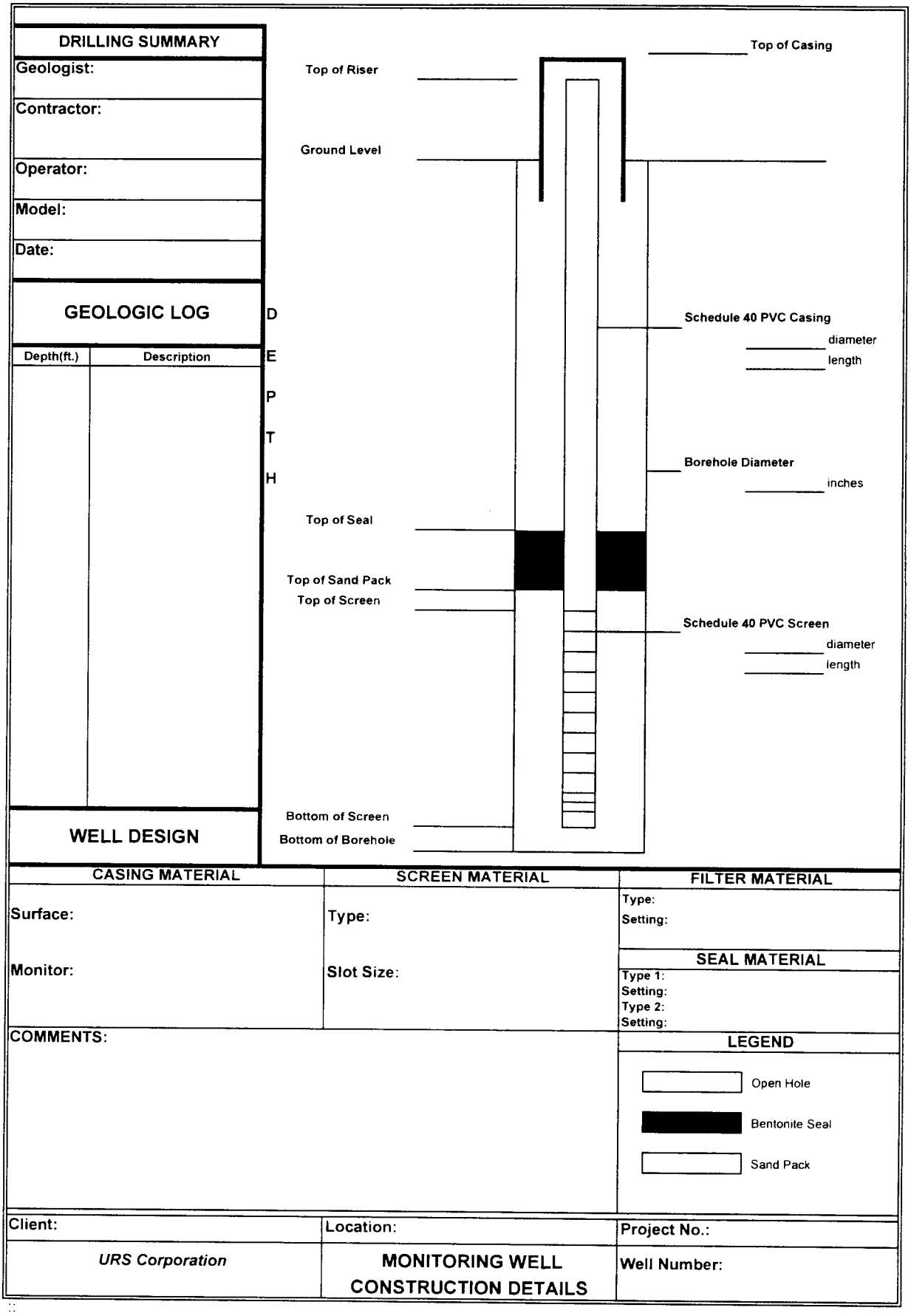
11) Insert riser cap (J-plug) into well riser. Lock the protective casing cap.

12) Document well construction details in the field notebook and transfer the data onto the Monitoring Well Construction Detail form (Figure A4-2).

A4.10 Shallow Overburden Well/Piezometer Construction Procedures

Five overburden monitoring wells will be installed to allow for collection of groundwater samples. This monitoring wells will be screened from approximately 6 feet to 16 feet below ground surface, and will conform to the construction specification described below. Two piezometers will be installed to allow for groundwater and soil vapor test monitoring. The piezometers will be screened from approximately 4 feet to 24 feet bgs and will conform to the construction specification described below:

FIGURE A4-2
MONITORING WELL
CONSTRUCTION DETAIL FORM



Procedure

1) Advance the 4¼-inch inside diameter (ID) HSAs to approximately 10 feet below the water table.

2) Remove the center plug from the augers and measure the depth.

3) Insert a 10-foot section of 2-inch ID continuous slot PVC well screen. Attach sections of 2-inch ID PVC riser pipe through the augers as necessary. Cap the top of the riser pipe to prevent well construction material from entering the well.

4) Add sand to the screened section of the well and slowly remove the augers. The sand pack should extend at least 2 feet above the top of the well screen. Measure with a weighted measuring tape to ensure the sand pack has been installed accurately.

5) Slowly add bentonite pellets into the borehole and continue to slowly remove the augers. The bentonite seal should extend at least 2 feet above the sand pack. Measure with a weighted measuring tape.

   Note: The rate of removal of the augers from the borehole should closely follow the rate that the sand pack and bentonite pellets fill the borehole.

6) Hydrate the bentonite pellets with water and let set for 30 minutes.

7) Mix cement/bentonite grout per the specifications presented in Section 4.8 (if necessary).

8) Add the grout to the borehole via a hose. Fill the borehole to 2 feet below the ground surface (if necessary).

9) Backfill the remaining 2 feet of the borehole with concrete.

10) Cut the well riser pipe just below the ground surface and install protective flush-mount casing into the concrete around riser pipe.

11) Insert riser cap (J-plug) into well riser. Lock the protective casing cap.

12) Document well construction details in the field notebook and transfer the data onto the Monitoring Well Construction Detail form (Figure A4-2).

A4.11 Recovery Well Construction Procedures

The recovery well will conform to the program and design specifications set forth in the Project Management Work Plan.

One 6-inch recovery monitoring well will be installed to allow for an aquifer pump test and a soil vapor pilot test. The recovery well will be screened from approximately 6 feet to 26 feet below ground surface, and will conform to the construction specification described below.

Procedure

1) Advance the 8¼-inch diameter (ID) HSAs to the top of the bedrock.

2) Remove the center plug from the augers and measure the depth to the top of bedrock from the ground surface using a weighted measuring tape.

3) Attach a nominal 7⅞-inch roller bit to the drill rods and ream 1 foot into bedrock through the augers.

4) Insert a 20-foot section of 6-inch ID continuous wrap wire-wound stainless steel well screen. Attach sections of 6-inch stainless steel riser pipe through the augers as necessary. Cap the top of the riser pipe to prevent well construction material from entering the well. The length of well screen may be modified due to the actual depth to bedrock.

5) Add sand to the screened section of the well and slowly remove the augers. The sand pack should extend at least 2 feet above the top of the well screen. Measure with a weighted measuring tape to ensure the sand pack has been installed accurately.

6) Slowly add bentonite pellets into the borehole and continue to slowly remove the augers. The bentonite seal should extend at least 2 feet above the sand pack. Measure with a weighted measuring tape.

Note: The rate of removal of the augers from the borehole should closely follow the rate that the sand pack and bentonite pellets fill the borehole.

7) Hydrate the bentonite pellets with water and let set for 30 minutes.

8) Mix cement/bentonite grout per the specifications presented in Section 4.8.

9) Add the grout to the borehole via a hose (if necessary). Fill the borehole to 2 feet below the ground surface.

10) Backfill the remaining 2 feet of the borehole with concrete.

11) Cut the well riser pipe just below the ground surface and install protective flush-mount casing into the concrete around riser pipe.

12) Insert riser cap (J-plug) into well riser. Lock the protective casing cap.

13) Document well construction details in the field notebook and transfer the data onto the Recovery Monitoring Well Construction Detail form (Figure A4-3).

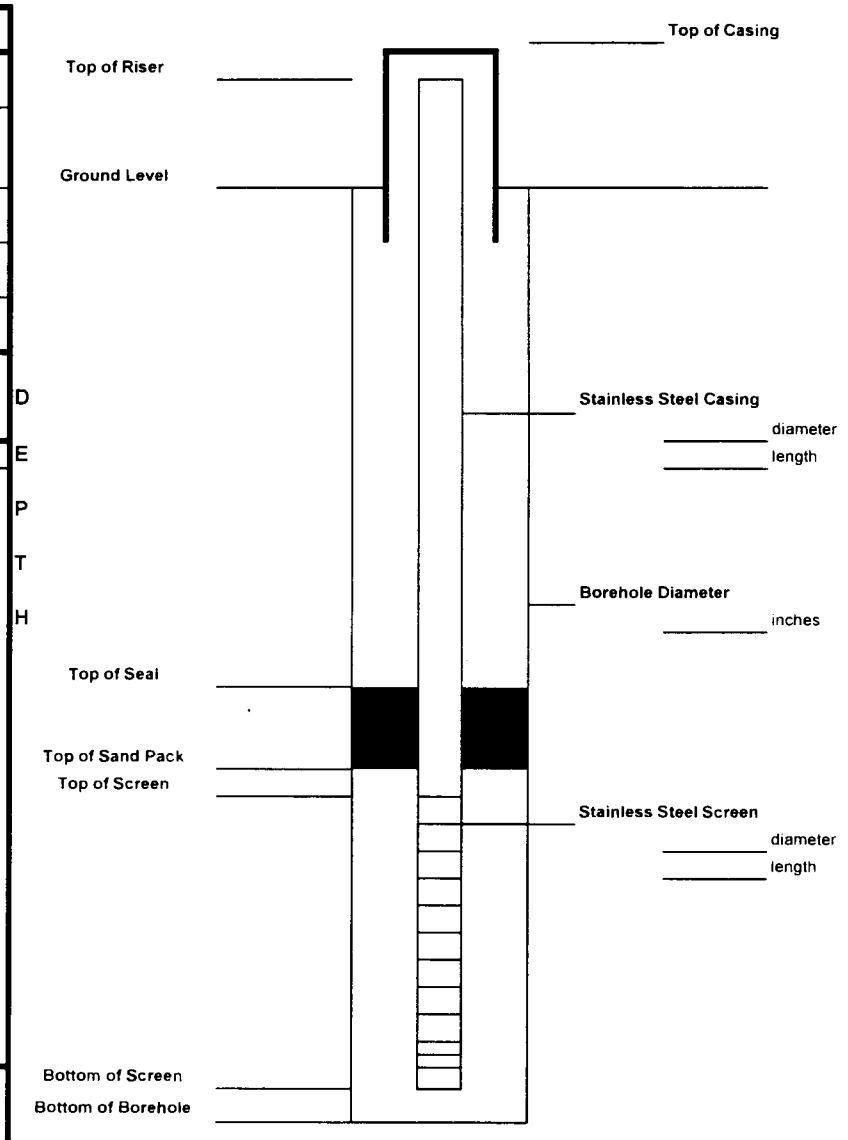
FIGURE A4-3
RECOVERY WELL
CONSTRUCTION DETAIL FORM

DRILLING SUMMARY
Geologist:
Contractor:
Operator:
Model:
Date:

GEOLOGIC LOG

Depth(ft.)	Description

DEPTH



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface:	Type:	Type: Setting:
Monitor:	Slot Size:	**SEAL MATERIAL** Type 1: Setting: Type 2: Setting:

COMMENTS:

LEGEND

- Open Hole
- Bentonite Seal
- Sand Pack

Client:	Location:	Project No.:
URS Corporation	RECOVERY WELL CONSTRUCTION DETAILS	Well Number: RH-GW-001

A4.12 Well Development Procedures

Following completion of drilling and well installation, each new and existing monitoring well will be developed by pumping until the discharged water is relatively sediment free and the indicator parameters (pH, temperature, turbidity, dissolved oxygen, and specific conduction) have reached steady-state. Developing the well not only removes any sediment, but also may improve the hydraulic properties of the formation. The effectiveness of the development measures will be monitored closely to keep the volume of discharged water to the minimum necessary to obtain sediment-free samples. A portable turbidimeter will be used to monitor effectiveness of development. A turbidity reading of less than 50 nephelometric turbidity units (NTUs) and steady-state pH, temperature, dissolved oxygen, and specific conductivity readings will be used as a guide for discontinuing well development.

Procedure

1) Newly installed monitoring wells will be developed using surge block agitation and overpumping until the turbidity is consistently less than 50 NTUs, and the indicator parameters have reached steady-state. All existing monitoring wells will be redeveloped until the turbidity is consistently less than 50 NTUs.

2) Equipment should be assembled, decontaminated (if necessary), and installed in the well. Care should be taken not to introduce contaminants to the equipment during installation.

3) Well development should proceed by repeatedly removing water from the well until the discharged water is relatively sediment-free. The volume of water removed from the wells will not be less than that lost to the formation during drilling. All development water will be containerized on site in a bulk 1,500-gallon holding tank. The water will be tested and subjected to on site activated carbon filtration (if necessary), and discharged into the combined sewer system. The effectiveness of development should be monitored at regular intervals using a portable turbidimeter.

Volume of water removed and turbidity, pH, temperature, dissolved oxygen, and conductivity measurements will be recorded on a Well Development Log form (Figure A4-4).

4) Well development will be discontinued when the turbidity of the discharged water is below 50 NTUs and the other indicator parameters have stabilized.

A4.13 Documentation

A field notebook will be initiated at the start of on site work and maintained by the Field Coordinator. The field notebook will include the following daily information regardless of what activity is being performed.

- Date
- Meteorological conditions
- Crew members
- Brief descriptions of proposed field activities
- Locations where work is performed
- Problems and corrective actions taken
- All field measurements or descriptions recorded
- Calibration of field equipment used
- All modifications of the FSP

Each subsurface boring will be logged in a bound field notebook during drilling by the supervising geologist. Field notes will include descriptions of subsurface materials encountered during drilling, sample numbers, and types of samples recovered from the borehole. Additionally, the geologist will note time and material expenditures for later verification of contractor invoices on the Daily Drilling Record (Figure A4-5).

FIGURE A4-4
WELL DEVELOPMENT LOG

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: _____

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	_____	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	_____	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	_____	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	_____	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	_____	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	_____	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	_____	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											

COMMENTS:

FIGURE A4-5
DAILY DRILLING RECORD

DAILY DRILLING RECORD

URS Corporation

PROJECT TITLE: _____ DATE: _____

CLIENT: _____ CONTRACTOR: _____

FROM	TO	PRODUCTIVE HOURS	ACTIVITIES/COMMENTS
TOTAL PRODUCTIVE HOURS			LEVEL B / LEVEL C / LEVEL D (CIRCLE ONE SELCTION)

LABOR:

UNITS	

MATERIALS / SUPPLIES:

UNITS	

WEATHER:

_____ URS ONSITE COORDINATOR

_____ CONTRACTOR REPRESENTATIVE

FIGURE A4-6
WELL PURGING LOG

WELL PURGING LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: _____

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=		3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=		4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=		5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											

COMMENTS:

Upon completion of daily drilling activities, the geologist will complete the daily drilling record and initiate chain-of-custody for any samples recovered for chemical laboratory testing. Following completion of the drilling program, the geologist will transfer field notes onto standard forms for the report.

The proper completion of the following forms/logs will be considered correct procedure for documentation during the drilling program:

- Test Boring Logs (Figure A4-1)
- Monitoring Well Construction Details (Figure A4-2)
- Recovery Well Construction Details (Figure A4-3)
- Well Development (Figure A4-4)
- Well Purging Log (Figure A4-5)
- Daily Drilling Record (Figure A4-6)
- Chain of Custody Record (Figure A4-7)
- Field Log Book - weather-proof, bound field book

CHAIN OF CUSTODY RECORD

URS Greiner

PROJECT NO. | SITE NAME

SAMPLERS (PRINT/SIGNATURE)

DELIVERY SERVICE: _____ AIRBILL NO.: _____

LAB _____

COOLER _____ of _____

PAGE _____ of _____

LOCATION IDENTIFIER	DATE	TIME	COMP/ GRAB	SAMPLE ID	MATRIX	TOTAL NO.# OF CONTAINERS	TESTS	BOTTLE TYPE AND PRESERVATIVE	REMARKS	SAMPLE TYPE	BEGINNING DEPTH (IN FEET)	ENDING DEPTH (IN FEET)	FIELD LOT NO.# (IRPIMS ONLY)

MATRIX CODES

AA - AMBIENT AIR; SE - SEDIMENT; SH - HAZARDOUS SOLID WASTE; SL - SLUDGE; WP - DRINKING WATER; WW - WASTE WATER; WG - GROUND WATER; SO - SOIL; DC - DRILL CUTTINGS; WL - LEACHATE; GS - SOIL GAS; WC - DRILLING WATER; WO - OCEAN WATER; WS - SURFACE WATER; WQ - WATER FIELD QC; LH - HAZARDOUS LIQUID WASTE; LF - FLOATING/FREE PRODUCT ON GW TABLE

SAMPLE TYPE CODES

TB# - TRIP BLANK; SD# - MATRIX SPIKE DUPLICATE; RB# - RINSE BLANK; FR# - FIELD REPLICATE; N# - NORMAL ENVIRONMENTAL SAMPLE; MS# - MATRIX SPIKE

(# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME	SPECIAL INSTRUCTIONS
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY (SIGNATURE)	DATE	TIME	

Distribution: Original accompanies shipment, copy to coordinator field files

URSF 075C/1 OF 1/ColCR/GCM

Figure A4-7

A5.0 GROUNDWATER INVESTIGATION

Nineteen monitoring wells will be sampled; ten from newly installed wells, and nine from existing wells (Figure A5-1). Groundwater samples will be analyzed for parameters identified in Table A5-1. To collect representative groundwater samples, groundwater wells must be adequately purged prior to sampling. Low volume sampling equipment and procedures will be used to purge the wells and retrieve groundwater samples. Purging will require the removal of one to three volumes of standing water by pumping at a rate of less than one (1) liter per minute. Drawdown must not exceed ten percent of the standing water column. Sampling should commence immediately after purging.

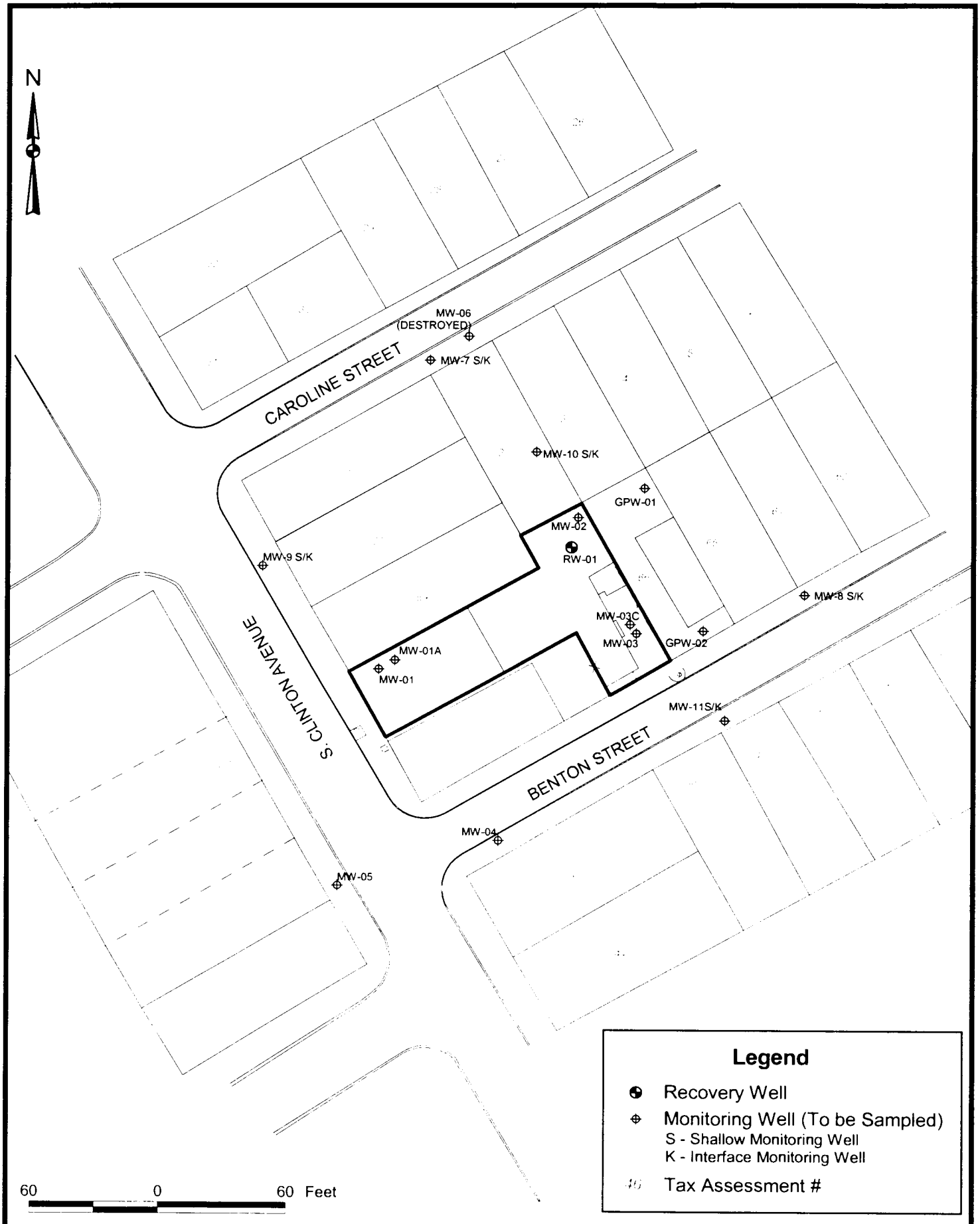
Groundwater sampling frequency is defined in Section 2.2.13 of the Project Management Plan. The wells will be sampled following procedures found in Section A5.2. The samples will be labeled and shipped following procedures outlined in Sections A9.0 and A10.0 and analyzed for the parameters identified in Table A5-1.

A5.1 Well Purging Procedures

Procedures

1) The well cover will be unlocked and carefully removed to avoid having any foreign material enter the well. The interior of the riser pipe will be monitored for organic vapors using a photoionization detector (PID). If a reading of greater than 5 parts per million (ppm) is recorded, the well will be vented until levels are below 5 ppm before purging begins.

2) Using an electronic water level detector, the water level below top of casing will be measured. Knowing the total depth of the well, it will be possible to calculate the volume of water in the well. The end of the probe will be soap-and-water-washed and deionized-water-rinsed between wells.



J:\35798.01\dbg\sisite.apr PROPOSED SAMPLING LOCATIONS 9/25/2000

URS Greiner Woodward Clyde	FORMER DINABURG DISTRIBUTING MONITORING WELL SAMPLING LOCATIONS	FIGURE A5-1

TABLE A5-1
SUMMARY OF ANALYTICAL PARAMETERS

Parameter	Method Number / Reference[1]	Estimated Number of Samples	QA/QC Samples			Total No. of Samples
			MS/MSD/MD/MSB	Rinse Blanks	Trip Blanks	
I. Groundwater (Sewer Sampling)						
Target Compound List (TCL) Volatiles + TICs	ASP 95-1	5	1/1/0/1	0	1	9
II. Groundwater						
TCL Volatiles + TICs	ASP 95-1	19	1/1/0/1	1	6	29
TCL Semivolatiles + TICs	ASP 95-2	19	1/1/0/1	1	0	23
TAL Metals	ASP CLP-M	19	1/0/1/0	1	0	22
III. Subsurface Soil						
TCL Volatiles + TICs	ASP 95-1	25	2/2/0/2	1	0	32
TCL Semivolatiles + TICs	ASP 95-2	25	2/2/0/2	1	0	32
TCL PCBs	ASP 95-3	25	2/2/0/2	1	0	32
IV. Groundwater (Tank Water Testing)						
Halogenated Volatiles	601	2	0/0/0/0 [2]	0	1	3
Aromatic Volatiles	602	2	0/0/0/0 [2]	0	1	3
V. Waste Characterization						
TCLP Extraction	ASP Vol.2, Part X	1	0/0/0/0 [2]	0	0	1
TCLP Volatiles	8260B	1	0/0/0/0 [2]	0	0	1
TCLP Semivolatiles	8270C	1	0/0/0/0 [2]	0	0	1
Ignitability	1030	1	0/0/0/0 [2]	0	0	1
Reactivity	9040B	1	0/0/0/0 [2]	0	0	1
Corrosivity	Chapter 7 Section 7.3	1	0/0/0/0 [2]	0	0	1

NOTES:
1 - NYSDEC Analytical Services Protocol, 10/95 edition.

3) Calibrate field instruments (e.g., pH, specific conductance, PID, turbidity).

4) In all wells, a decontaminated submersible pump will be used to purge the required water volume (i.e., until stabilization of pH, temperature, specific conductivity, and turbidity). Dedicated new high density polyethylene (HDPE) discharge and intake tubing will be used for each well.

5) Slowly install the well pump into the well and set the pump to about the midpoint of the well screen. Configure the dedicated HDPE tubing with a three-way gate valve with the discharge directed through the three-way valve and micropurge flow cell and into a calibrated bucket.

6) Set the pump rate to less than 1 liter per minute and measure the water level continuously. Adjust the discharge rate until the water level does not drop beyond 10 percent of the screen length.

7) Purge well until the water quality parameters have stabilized. The stabilization criteria are: specific conductivity - 3% full scale range; pH - 0.10 pH unit; temperature - 0.2°C, and turbidity <50 NTU.

8) Purging of three well volumes is not necessary if the indicator parameters are stable. However, at least one (1) well volume must be purged before sampling can begin. During purging, it is permissible to by-pass the flow cell until the groundwater has cleared.

9) Indicator parameters must be measured continuously using the flow cell.

10) Well purging data are to be recorded in the field notebook and on the Well Purge Log (Figure A4-5).

11) Dispose of HDPE tubing as per Section A12.0.

A5.2 Groundwater Sampling Procedures

Procedures

1) After well purging is completed, a sample will be collected into the appropriate containers. The sampling order shall be volatiles, semivolatiles, then metals. Use an in-line filter (0.45 μm) if filtered metals analyses if required.

2) Disconnect the flow cell during sampling and reduce pump rate to 100 milliliters per minute. Direct the discharge tubing toward the inside wall of the sample container to minimize volatilization. Fill volatile sample containers so no headspace (air bubbles) are present. Preserve as needed and cap all sample containers.

3) All sample bottles will be labeled in the field using a waterproof permanent marker (Section A9.0).

4) Samples will be collected into sample bottles (Table A5-2) (containing required preservatives) and placed on ice in coolers for processing (preservation and packing) prior to shipment to the analytical laboratory. A chain-of-custody record will be initiated. The analytical laboratory will certify that the sample bottles are analyte-free prior to shipping.

5) Remove pump and disconnect valves and tubing. Submersible pumps must be decontaminated prior to and between each use. Clean pump by flushing 10 gallons of potable water through the pump. Rinse with deionized water after flushing the pump.

6) Well sampling data are to be recorded in the field notebook and on the Well Purging Log (Figure A4-6).

A5.3 Water Level Monitoring Procedures

Determination of groundwater surface elevations throughout a monitoring well network makes possible the construction of a potentiometric surface contour map and determination of groundwater flow patterns.

Water levels in all monitoring wells will be measured using an electronic water level indicator or weighted tape. Initially, measurements will be taken following well development until the well has recovered to anticipated static conditions. Water levels will also be measured prior to groundwater purging sampling. Water level measurement procedures are presented below.

Procedure

1) Clean water level probe following the decontamination procedures (Section A8.0) and test water level meter to ensure that the batteries are charged.

2) Lower probe slowly into the monitoring well until audible alarm indicates the top of the water column.

3) Read the depth to the nearest hundredth of a foot, from the graduated cable using a set reference point on the riser pipe.

4) Repeat the measurement for confirmation and record the water level.

5) Remove the probe from the monitor slowly, drying the cable and probe with a clean "Chem Wipe" or paper towel.

6) Replace monitoring well cap and lock protective cap in place.

7) Decontaminate the water level indicator (Section A8.0) if additional measurements are to be taken.

TABLE A5-2
SAMPLE CONTAINER, PRESERVATION, AND HOLDING TIME REQUIREMENTS
FORMER DINABURG DISTRIBUTING SITE

PARAMETER	ANALYTICAL METHOD [1]	CONTAINER	PRESERVATION	HOLDING TIME [2]
Water				
TCL Volatiles + TICs	ASP 95-1	2 x 40ml VOA, Glass	HCl to pH<2, Cool 4° C	10 days preserved
Volatiles	601/602	2 x 40ml VOA, Glass	HCl to pH<2, Cool 4° C	10 days preserved
TCL Semivolatiles + TICs	ASP 95-2	2 x 1 L Amber Glass	Cool 4° C	5 days until extraction/40 days for analysis
TAL Metals (total)	ASP CLP-M	1 x I L HDPE	HNO_3 to pH<2, Cool 4° C	6 months; 26 days for mercury
Soil/Sediment/Waste				
TCL Volatiles + TICs	ASP 95-1	2 x 4 oz Glass	Cool 4° C	10 days
TCL Semivolatiles + TICs	ASP 95-2	1 x 4oz. Glass	Cool 4° C	10 days until extraction/40 days for analysis
TCL PCBs	ASP 95-3	1 x 4oz. Glass	Cool 4° C	10 days until extraction/40 days for analysis
TCLP Volatiles	8260B	2 x 4 oz. Glass	Cool 4° C	7 days to TCLP extraction/7 days for analysis
TCLP Semivolatiles	8270C	1 x 8 oz. Glass	Cool 4° C	5 days to TCLP extraction/7 days until extraction/40 days for analysis
Ignitability	1030	1 x 8 oz. Glass	Cool 4° C	As soon as possible
Corrosivity	9045C	1 x 4 oz. Glass	Cool 4° C	As soon as possible
Reactivity	Chapter 7 Section 7.3	1 x 4 oz. Glass	Cool 4° C	As soon as possible

1 - New York State Department of Environmental Conservation, Analytical Services Protocol (ASP), 10/95 Edition.

2 - All holding times begin with the Validated Time of Sample Receipt (VTSR) at the laboratory.

A5.4 Sample Container, Preservation and Holding Time Requirements

Table A5-1 presents the summary of analytic parameters for all samples to be collected as part of this RI. Table A5-2 lists the sample container, volume, preservation and holding time requirements for samples to be collected at the site.

A5.5 Groundwater Pumping Tests

A groundwater pumping test will be performed in the recovery well (RW-01) to determine the aquifer characteristics. Prior to conducting pumping tests, groundwater levels will be measured in all wells and piezometers using an electronic interface probe or pressure transducer. Groundwater elevations will be measured at least twice before the initiation of the pumping test. This data will be used to establish base-line groundwater elevations.

The pump test will be performed using a submersible pump which is capable of producing variable pumping rates up to 15 gallons per minute (gpm). The pumps and hoses will be of sufficient size to allow the insertion of an electronic water level indicator during pumping. Collected groundwater will be pumped through activated carbon and then be discharged to the local sewer for treatment at the Monroe County facility.

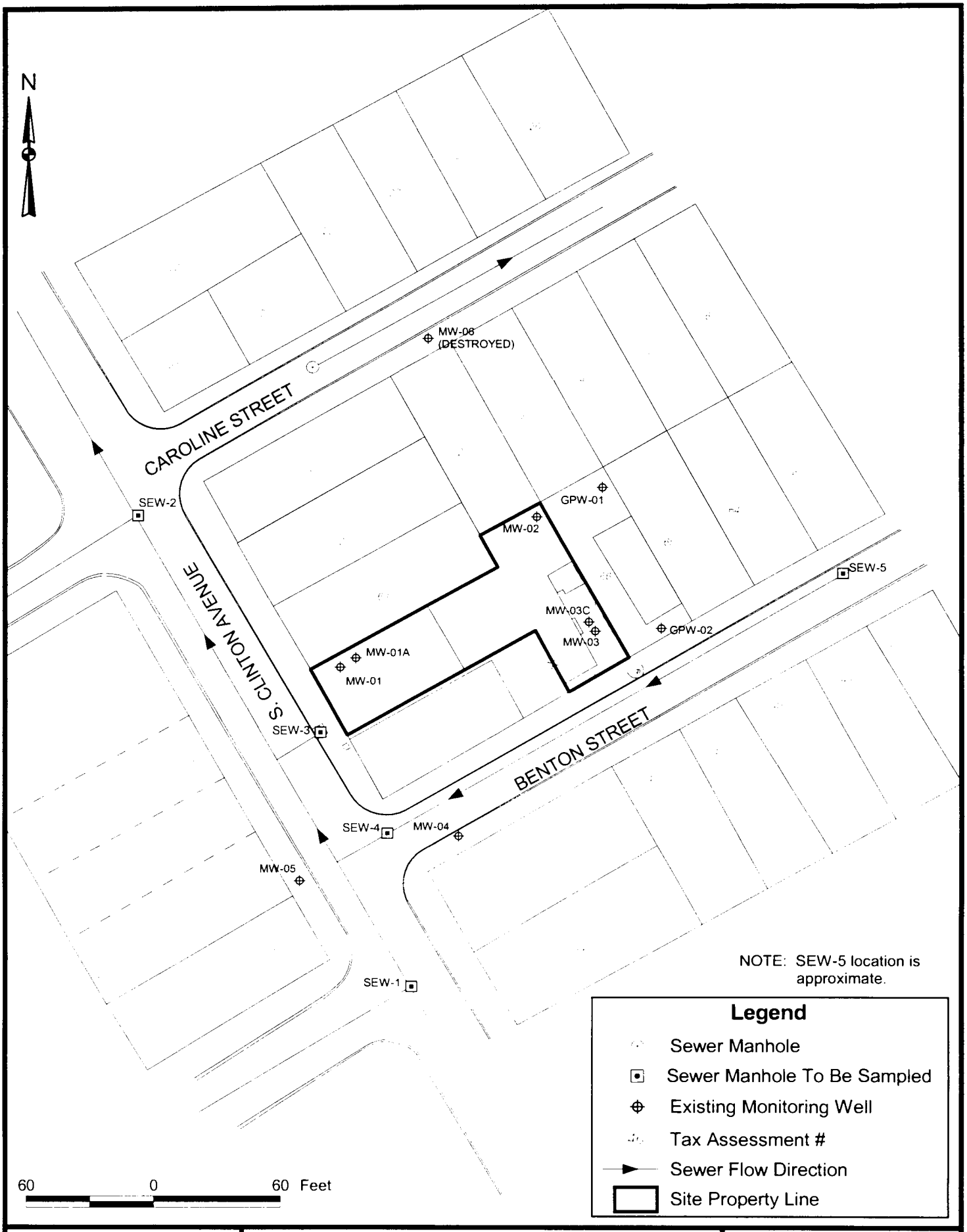
A step drawdown test well be performed to determine the appropriate pumping rate for the recovery well. This test requires the recovery well to be pumped at constant fractions of their maximum capacity for approximately one hour while continuously measuring water recovery levels and monitoring the discharge rate. Water levels in the piezometers also will be monitored periodically.

A constant rate pumping test will then be performed in the recovery well after the aquifer has stabilized. The constant rate test consists of pumping the well at a constant rate (determined from the step drawdown test) and measuring water levels in select piezometers located in the vicinity of the well. The pumping will be continued for approximately 72 hours or more depending on field conditions. The time intervals for water measurements will be field determined. Recovery will be monitored for up to 24 hours.

A6.0 SEWER SAMPLING

In order to evaluate the potential impact of site contaminants to local sewers, three water samples will be collected from three sewers at the locations shown in Figure A6-1. The sewer water samples will be analyzed at the analytical laboratory for TCL VOC's. Sewer water sampling procedures are described below.

Prior to collecting sewer water samples, the sewers will be monitored for VOC's using a Toxic Vapor Analyzer (TVA) and for methane, oxygen, and hydrogen sulfide using a Combustible Gas Indicator (CGI). The depth to water and total water depth will be measured from the ground surface. A well bailer will be attached to bailing rope in order to access the sewer water. The bailer will be gently lowered beneath the surface of the water in a manner that will not disturb the bottom sediments. The sample will be transferred into the appropriate VOC vials and packed on ice for shipment to the analytical laboratory. After sample collection, measure the depth of sediment with the telescoping sampling rod.



URS Greiner Woodward Clyde	FORMER DINABURG DISTRIBUTING SEWER MANHOLE SAMPLING LOCATIONS	FIGURE A6-1

J:\35798.01\db\gis\site apr SEWER MANHOLE SAMPLING LOCATIONS 9/25/2000

A7.0 SURVEYING AND MAPPING

Project control surveying will provide for site topographic mapping and for location of sampling points. All surveying will be performed under the supervision of a New York State licensed land surveyor, following the requirements of the Project Management Plan and the HASP.

A7.1 Establishing Horizontal Primary Project Control

In order to determine the horizontal locations of site features, horizontal control will be established by surveying to/from established survey monuments in the New York State Plane Coordinate System, Transverse Mercator Projection, West Zone, North American Datum (NAD) of 1983. This information will be used for base map preparation.

Procedure

1) Research for monuments.
2) Recover monuments in field.
3) Set and reference points on primary traverse.
4) Turn angles and measure distances.
5) Compute closures and adjust traverse.

A7.2 Establishing Vertical Primary Project Control

In order to determine site elevations, vertical control must be established by surveying to/from established survey monuments in the North American Vertical Datum (NAVD) of 1988.

Procedure

1) Research for monuments.
2) Recover monuments in field.
3) Set project benchmarks.

4) Run level line from monuments to set project benchmarks and back.

5) Reduce notes and adjust benchmark elevations.

6) Prepare recovery sketches.

A7.3 Global Positioning System (GPS) Surveying

Most of the surveying will be performed using GPS systems methodologies. This data will be converted into the horizontal and vertical coordinate systems noted in Sections A7.1 and A7.2.

A8.0 SAMPLING EQUIPMENT CLEANING PROCEDURES

To assure that no outside contamination will be introduced into the samples/data, thereby invalidating the samples/data, the following cleaning protocols will apply for all equipment used to collect samples/ data during the field investigations. Drilling equipment and heavy machinery will be steam cleaned on site on the decontamination pad located on the southern parcel of the site. All water generated during washing will be containerized and transported to the drum staging area.

Procedures:

1) Thoroughly clean equipment with soap and tap water, until all visible contamination is gone.
2) Rinse with tap water, until all visible evidence of soap is gone.
3) Rinse with deionized water.
4) Rinse with 10% reagent grade nitric acid.
5) Rinse with pesticide grade methanol.
6) Air dry.
7) If equipment will not be used immediately, wrap in oil-free aluminum foil.

A9.0 SAMPLE LABELING

In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, sample labeling procedures listed below will be followed:

Procedure:

1) Affix a label to each sample container. The following information will be written on each label with permanent marker prior to wrapping label with cellophane tape:

Site name
Sample identification
Project number
Date/time
Sampler's initials
Sample preservation
Analysis required

2) Each sample of each matrix will be assigned a unique alpha-numeric identification code. An example of this code and a description of its components is presented below:

Examples

1. MW1-GW
   MW1 =Monitoring Well 1
   GW = Groundwater

2. SB1 - 2'-4'
   SB1 = Soil Boring 1
   2' - 4' =Two-foot to four-foot soil sample

List of Abbreviations

Monitor Type

MW = Monitoring Well

S = Shallow

K = Interface

Sample Type

SEW = Sewer

SB = Soil Boring

GW = Groundwater

WW = Waste Water

EB = Equipment Rinse Blank

HW = Hydrant Water (Decon Water/Drilling Water)

TB = Trip Blank

RB = Rinse Blank

MS = Matrix Spike

MSD = Matrix Spike Duplicate

MD = Matrix Duplicate

A10.0 SAMPLE SHIPPING

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with the samples.

The procedures used in this remedial predesign follow the chain-of-custody guidelines outlined in NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure

1) The chain-of-custody (COC) record (Figure A4-7) should be completely filled out, with all relevant information.

2) The original COC goes with the samples. It should be placed in a ziplock bag and taped inside the sample cooler. The sampler should retain a copy of the COC.

3) Place 2-inches of inert cushioning material such as vermiculite or bubble-wrap in bottom of cooler.

4) Place bottles in cooler in such a way that they do not touch (use cardboard dividers or bubble-wrap).

5) Wrap\VOA vials securely in bubble-wrap and tape. Place them in the center of the cooler.

6) Pack cooler with ice in doubled ziplock plastic bags.

7) Pack cooler with cushioning material.

8) Tape drain shut.

9) Wrap cooler completely with strapping tape at two locations securing the lid. Do not cover any labels.

10) Place lab address on top of cooler. For out-of-town laboratory, add the following: Put "This side up" labels on all four sides and "Fragile" labels on at least two sides. Affix numbered custody seals on front right and left of cooler. Cover seals with wide, clear tape.

11) Ship samples via overnight carrier the same day that they are collected, whenever possible.

A11.0 FIELD SAMPLING INSTRUMENTATION

Field sampling equipment, such as a split spoon, hand auger, etc., will require no maintenance beyond decontamination between sampling locations. Calibration procedures for electronic instruments are summarized on the following pages. More detailed procedures for instrument calibration and maintenance can be found in the equipment operating manuals.

Maintenance procedures for the common instrumentation that will be used during field investigations are discussed in the manufacturer operating manuals. A copy of the manufacturer's operating manual for each instrument will be kept with the instrument or the operator. All field sampling equipment will be calibrated each day of use. The calibration procedures and results will be recorded in the field notebook.

A11.1 Photoionization Detector (PID)

The photoionization detector (PID) (HNu Model PI 101) is a portable instrument used to detect, measure, and provide a direct reading of the concentration of a variety of trace gasses. The detector employs the principle of photoionization. This process involves the absorption of ultraviolet light by a gas molecule leading to ionization.

Calibration Procedure

1) Turn function switch to BATT. The needle should be in the green region.
2) Turn function switch to STANDBY. Set the zero point with the zero set control.
3) Attach the ¼-inch tubing to the probe inlet and to the regulator on the tank of isobutylene and open the valve on the regulator. NOTE: If the pressure in the isobutylene tank is below 200 psi, consider the tank exhausted and use a full tank.
4) Turn the function switch to the 0-200 range.
5) Adjust the span setting so the meter gives a reading of 58 ppm.

A11.2 Combustible Gas Indicator (CGI)

The instructions listed below review the operation of the Bachrach Sentinel 44-Combustible/Toxic Gas and O_2 Deficiency Meter.

1) Press the POWER key.
2) Observe that the Liquid Crystal Display (LCD) backlight turns on. The backlight stays on for 30 seconds and then turns off.
3) Observe that the LCD sequences through the following messages:

Serial number and software version.

SERIAL xxxxxx
VERSION yyy

Where xxxxxx = serial number of unit
yy = software version level

Battery voltage and its capacity

BATTERY TEST
xx.xV yy% CAP

Where xx.x = battery voltage
yy = remaining battery capacity

If the dosimeter functions are turned on, the remaining number of dosimeter recording segments and hours for TWA and STEL calculations are displayed.

DOS CAPACITY
xx SGMNTS yy HR

Where xx = remaining number of recording segments

yy = remaining number of recording hours

Month, day, and year the instrument was last calibrated

LAST CAL DATE
mm/dd/yy

Alarm messages (e.g., "LOW BATTERY" "CALIBRATION EXPIRED", "MEMORY FULL", "ONLY x:x HOURS STORAGE REMAIN").

Real Time Gas display. A typical fresh-air four-gas display is shown below.

20.9 0 0 0
02 LEL CO H2S

5) The instrument now starts monitoring the surrounding air and provides readouts of the detected concentrations of oxygen and combustibles, plus carbon monoxide and/or hydrogen sulfide. A confidence beep is sounded once every minute to assure the user that the unit is on and monitoring the gas channels.

6) Allow the instrument to warmup for several minutes until the gas-display stabilizes. Then if one or more gas readings exceed the limits listed below while sampling fresh air, the sensors should be software zeroed.

Oxygen	20.9± 0.5%
Combustibles	± LEL
Carbon Monoxide	± 10 ppm

Hydrogen Sulfide ± 5 ppm

7) Before each day's usage, sensitivity must be tested on a known concentration of calibration gas specified on the instrument nameplate that is equivalent to 25 to 50% of full scale concentration. Accuracy must be within ±20% of actual.

A11.3 Micropurge Flow Cell

The Micropurge Flow Cell is a complete system for monitoring chemical parameters during groundwater purging and sampling. Discharge from the purging/sampling pump in routed through an engineered flow cell that contains a multi-parameter sensor probe. Readings from the probe are displayed on a hand-held meter which can also store readings for future recall or transfer to a personal computer. The flow cell measures:

- Temperature
- Conductivity
- Percent dissolved oxygen
- pH
- Oxidation/reduction potential (ORP)

Parameters which can be derived and displayed include:

- Specific Conductivity
- Salinity
- Dissolved oxygen in micrograms per liter (mg/L)
- Total Dissolved Solids
- Resistivity

Calibration procedures for the above-stated parameters are provided in the instrument user manual. The manual will be kept on site with the instrument for reference.

A11.4 Turbidity Meter

The turbidity meter is a portable water quality monitoring instrument which measures water clarity in nephelomatic turbidity units (NTU). Specifically, turbidity meters measure scattered light through water at 90 degrees from the light source. A reference beam passes through the sample and is measured at 180 degrees. The ratio of the two readings are electronically converted to NTU. Routine calibration is outlined below.

1) Fill the turbidity tubes with 1.0 NTU and 10.0 NTU standards and wipe the outer wall with a clean cloth.

2) Open the lid of the turbidimeter and insert the turbidity tube. Be sure to align the indexing arrow on the turbidity tube with the arrow on the meter.

3) Close the lid and press "Read". If the displayed value is not the same as the standard, proceed to Step 4. If the displayed value is the same as the standard, end calibration and the instrument is ready to be used.

4) Depress the "Cal" button for 5 seconds until cal is displayed. Adjust the flashing displayed value using the up/down arrow keys until the desired value is displayed.

5) Press "cal" button to store values to memory and end calibration. The meter is now ready for use. Place turbidity tubes with water samples into the meter and press "Read".

A11.5 Total Vapor Analyzer (TVA)

The TVA is a portable instrument that measures total organic vapors via a flame ionization detector and a photoionization detector. Prior to starting the instrument, make sure that the battery is charged, the sample probe is connected, the hydrogen tank is filled, and the hydrogen valve is in the "on" position. Allow the instrument to warm up for 20 minutes. Once the warm up period has expired, the instrument is ready for calibration and use. The procedures described below detail the steps required to set up the instrument for use.

Normal Operation Procedure

1) Press the ON key
2) Press the CONTROL key
3) Press the 3 key to ignite the flame ionization detector
4) Once the flame has ignited, the instrument automatically enters the run mode and is ready for measurement.
5) To shut the instrument off, press the OFF key and close the hydrogen valve.
6) Recharge the battery after each days use.

To calibrate the unit, execute the following procedure:

1) Press ON
2) Press CONTROL
3) Press 3 to ignite
4) Press 2 = Setup
5) Press 1 = Calibrate
6) Press 2 = Span Concentration
7) Enter Span Concentration for calibration gas being used

Note: IF PID only, enter concentration of isobutylene. If FID only, enter concentration of methane. If dual, enter concentration of both gases.

8) Press 3 = Zero

9) Press 1 = Both

10) Challenge analyzer with zero gas sample

11) Press ENTER = start

12) Wait to stabilize

13) Press ENTER = start

14) Press 4 = Span

15) (PID 1st) Press 2 = PID

16) Press ENTER = start

17) Challenge analyzer with isobutylene span gas and wait for readings to stabilize

18) Press ENTER to accept

19) Press 4 = Span

20) Press 3 = FID

21) Press ENTER = Start

22) Challenge analyzer with methane span gas and wait for readings to stabilize

23) Press ENTER = Accept

24) Press 5 = Response Factor

25) Confirm that Response Factor says "RF0:DEFAULT"

26) Press EXIT 2 times to main menu

27) Press 1 = Run

You are now in the survey mode.

A11.6 Preventative Maintenance

Table A11-1 presents the URSGWC field instrumentation preventative maintenance summary. In case of an emergency, other URSGWC offices, the instrument manufacturer, and/or an equipment rental vendor will be contacted. If necessary, instrumentation manufacturers will be contacted for unit repair/replacement. In addition, potential instrumentation rental vendors, which could provide overnight UPS/Federal Express service, are listed below.

Vendors

Response Rentals: Rochester, NY: 1-716-424-2140

Hazco Services: Dayton, OH 1-800-343-0256

TABLE A11-1

FIELD INSTRUMENTATION PREVENTATIVE MAINTENANCE SUMMARY

Instrument	Maintenance Details
HNU PI-101 **Photoionization Detector**	**Initiate factory checkout and calibration, yearly or when malfunctioning or after changing UV light source. Wipe down readout unit after each use. Clean UV light source window every month or as use and site conditions dictate. Clean the ionization chamber monthly. Recharge battery after each use.** **Service: 800-343-0256**
Micropurge Flow Cell Model FC4000	**Calibrate the required parameters using appropriate factory-suppled standards and buffers on a daily basis. Store the sonde (probe) in a 2M KCl solution at the end of each work day. Factory calibrate annually.**
Bacharach Sentinel 44 **Combustible Gas Indicator**	**Calibrate LEL, O_2 and H_2S sensors daily. Replace foam pump filter monthly. Factory calibrate yearly.**
Lamotte Turbidity Meter	**Replace 9 volt battery when necessary. Clean lamp after each days use. Clean turbidity tubes after each reading and replace tubes when discoloration of glass occurs.**

A12.0 INVESTIGATION-DERIVED WASTE CHARACTERIZATION AND DISPOSAL

Fluids generated during equipment decontamination, well development and well purging will be treated on site (if necessary) and discharged into the local sewer system. Soil cuttings may also require off-site disposal. Sampling and treatment will be coordinated by URS. Personal protective equipment and high density polyethylene (HDPE) sampling equipment will be double bagged and placed for disposal at a municipal landfill.

PART B

QUALITY ASSURANCE PROJECT PLAN (QAPjP)

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APPENDICES

B-1 NYSDEC Data Package Summary Forms

B1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPjP) is designed to provide an overview of quality assurance/quality control (QA/QC) procedures and programs which will be adhered to during the Remedial Investigation (RI) activities as described in the Project Management Work Plan (PMWP) (URS, July 2000). The QAPP will give specific methods and QA/QC procedures for chemically testing environmental samples obtained from the former Dinaburg Distributing Site. In addition, it will help verify the quality of the data produced during the RI.

B2.0 PROJECT/SITE DESCRIPTION

The site is located in the City of Rochester, Monroe County, New York. A complete description of the former Dinaburg Distributing Site is provided in Section 1.1.1 - Site Description and History, of the PMWP.

B3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The URS Greiner Woodward Clyde (URSGWC) organizational structure for this project is presented in the PMWP. and identifies the names of key project personnel. In addition to overall project coordination, the Project Manager will be responsible for overseeing both the analytical and field QA/QC activities. The ultimate responsibility for maintaining quality throughout the project rests with the Project Manager.

The URSGWC Project QA/QC Officer is responsible for verifying that corporate QA procedures are followed. The QA/QC Officer (or designee) will be in direct contact with the analytical laboratory to monitor laboratory activities so that holding times and other QA/QC requirements are met.

The Remedial Investigation Coordinator is responsible for verifying that QA procedures are followed in the field. This will provide for the valid collection of representative samples. The Remedial Investigation Coordinator will be responsible for coordinating the activities of all personnel involved with implementing the project in the field, and will be in daily communication with the Field Geologist. This person will verify that all field work is carried out in accordance with the approved project Field Sampling Plan.

The analytical laboratory to be used for the analysis of soil, groundwater, and waste samples is H2M Labs, Inc. located in Melville, New York. The laboratory is certified by New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) for the appropriate categories (i.e., contract laboratory program procedures). The QA Manager of the laboratory will be responsible for performing project-specific audits and for overseeing the quality control data generated. Also, the Laboratory Project Manager will be in daily communication with the QA/QC Officer (or designee).

B4.0 DATA QUALITY OBJECTIVES

B4.1 Background

Data quality objectives (DQOs) are qualitative and quantitative statements which specify the quality of data required to support the RI for the former Dinaburg Distributing Site. DQOs focus on the identification of the end use of the data to be collected. The project DQOs will be achieved utilizing the definitive data category, as outlined in Data Quality Objective Process for Superfund, Interim Final Guidance, USEPA (September 1993). The definitive data are generated using rigorous analytical methods, such as approved United States Environmental Protection Agency (USEPA) reference methods. A summary of the analytical methods to be used is presented in Table B4-1.

The project DQOs for data collected during this remedial investigation are:

- To determine the extent of the dissolved-phase groundwater plume, groundwater flow direction, and evaluation of presence of dense non-aqueous phase liquids.
- To provide necessary data to design a multi-phase extraction system as an interim remedial measure (IRM).
- To determine extent of soil contamination, both onsite and offsite.
- To determine if the site contaminants are entering the adjacent sewer system.
- To maintain the highest possible scientific/professional standards for each procedure.
- To assure the ultimate defensibility of the data produced during the remedial investigation.

TABLE B4-1
ANALYTICAL METHODS
FORMER DINABURG DISTRIBUTING SITE

Parameter	Method No.	Holding Time From VTSR	Reference
TCL Volatiles + 10 TICs	95-1	7 days unpreserved, 10 days preserved	1
TCL Semivolatiles + 30 TICs	95-2	5 days (aqueous)/10 days (soil) extraction, then 40 days for analysis	1
TCL PCBs	95-3	5 days (aqueous)/10 days (soil) extraction, then 40 days for analysis	1
TAL Metal (23)	CLP-M	6 months (except mercury - 26 days)	1
Volatiles	601/602	7 days unpreserved/10 days preserved	3
TCLP Extraction	1311	Volatiles (ZHE) - 7 days Extractables (non-ZHE) - 5 days Metals - 6 months Mercury - 5 days	2
TCLP Volatiles	8260B	7 days from TCLP extraction	2
TCLP Semivolatiles	8270C	Extract within 7 days from TCLP extraction, then 40 days for analysis	2
Ignitability	1030	As soon as possible	2
Reactivity	Ch. 7, Section 7.3	As soon as possible	2
Corrosivity	9045C	As soon as possible	2

VTSR - Validated Time of Sample Receipt at the Laboratory

REFERENCES

1 New York State Department of Environmental Conservation, *Analytical Services Protocol* (ASP), 10/95 Edition.
2 USEPA, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846 Integrated Manual, Final Update III*, June 1997.
3 Federal Register, 40 CFR, Part 136, App A.

B4.2 QA Objectives For Chemical Data Measurement

For the definitive data category described above, the data quality indicators of precision, accuracy, representativeness, comparability, and completeness will be measured during the offsite chemical analysis.

B4.2.1 Precision

Precision examines the distribution of the reported values about their mean. The distribution of reported values refers to how different the individual reported values are from the average reported value. Precision may be affected by the natural variation of the matrix or contamination within that matrix, as well as by errors made in field and/or laboratory handling procedures. Precision is evaluated using analyses of a laboratory matrix spike/matrix spike duplicate (for organics) and matrix duplicates (for inorganics), which not only exhibit sampling and analytical precision, but indicate analytical precision through the reproducibility of the analytical results. Relative percent difference (RPD) is used to evaluate precision. RPD criteria must meet the requirements for the methods identified in Table B4-1.

B4.2.2 Accuracy

Accuracy measures the analytical bias in a measurement system. Accuracy may be affected by: errors that occurred during the sampling process; contamination originating in the field, during preservation procedures, or during sample handling; natural variations in the sample matrix; or by errors that occurred during laboratory sample preparation and analysis. Sampling accuracy may be assessed by evaluating the results of rinse and trip blanks. These data help to assess the potential contamination contribution from various outside sources. The laboratory objective for accuracy is to equal or exceed the accuracy demonstrated for the applied analytical methods on samples of the same matrix. The percent recovery criterion is used to estimate accuracy based on recovery in the matrix spike/matrix spike duplicate and matrix spike blank samples. The spike and spike duplicate, which indicates effect that the matrix may have on the target compounds, is also a good gauge of method efficiency. For volatile, semivolatile, and polychlorinated biphenyls (PCBs), surrogate

recovery results are measured. Acceptable ranges of recovery are reported in the referenced methods identified in Table B4-1.

B4.2.3 Representativeness

Representativeness expresses the degree to which the sample data accurately and precisely represent the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions. Representativeness is a qualitative parameter which is most concerned with the proper design of the sampling program or subsampling of a given sample. Objectives for representativeness are defined for sampling and analysis tasks and are a function of the investigative objectives (i.e., determination of vertical and horizontal extent of contamination). The sampling procedures, as described in Part A - Field Sampling Plan, have been selected with the goal of obtaining representative samples for the media of concern.

B4.2.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. A DQO for this program is to produce data with the greatest possible degree of comparability. This goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. Complete field documentation using standardized data collection forms will support the assessment of comparability. Comparability is limited by the other parameters (e.g., precision, accuracy, representativeness, completeness), because only when precision and accuracy are known can data sets be compared with confidence. In order that data sets may be comparable, it is imperative that contract-required methods and procedures be explicitly followed.

B4.2.5 Completeness

Completeness is defined as a measure of the amount of valid data obtainable from a measurement system compared to the amount that was expected to be obtained under normal conditions. To meet project needs, it is important that appropriate QC procedures be maintained to verify that valid data are obtained. For the data generated, a goal of 90 percent is required for

completeness (or usability) of the analytical data. If this goal is not met, then NYSDEC and URSGWC project personnel will determine whether the deviations may cause the data to be rejected.

B5.0 SAMPLING LOCATIONS AND PROCEDURES

Sampling locations and procedures are discussed in Sections 4, 5, and 6 of Part A - Field Sampling Plan. The laboratory analytical program is provided in Table B5-1.

TABLE B5-1
ANALYTICAL PROGRAM
FORMER DINABURG DISTRIBUTING SITE

MATRIX	SCHEDULE	METHOD	NO. OF SAMPLES
GROUNDWATER (SEWER)			
Samples:	TCL VOCs + TICs	ASP 95-1	5
Lab QC:			
MS/MSD/MSB	TCL VOCs	ASP 95-1	3
Field QC:			
TB	TCL VOCs + TICs	ASP 95-1	1
GROUNDWATER			
Samples:	TCL VOCs + TICs	ASP 95-1	19
	TCL SVOCs + TICs	ASP 95-2	19
	TAL Metals	ASP CLP-M	19
Field QC:			
TB	TCL VOCs + TICs	ASP 95-1	6
RB	TCL SVOCs + TICs	ASP 95-2	1
RB	TAL Metals	ASP CLP-M	1
RB	TCL VOCs + TICs	ASP 95-1	1
Lab QC:			
MS/MSD/MSB	TCL VOCs	ASP 95-1	3
MS/MSD/MSB	TCL SVOCs	ASP 95-2	3
MS/MD/LCS	TAL Metals (plus cyanide)	ASP CLP-M	3
GROUNDWATER (TANK TESTING)			
Samples:	VOCs	601/602	2
Field QC:			
TB	VOCs	601/602	1
SUBSURFACE SOIL			
Samples:	TCL VOCs + TICs	ASP 95-1 + TICs	25
	TCL SVOCs + TICs	ASP 95-2 + TICs	25
	TCL PCBs	ASP 95-3	25
Field QC:			
RB	TCL VOCs + TICs	ASP 95-1 + TICs	1
RB	TCL SVOCs + TICs	ASP 95-2 + TICs	1
RB	TCL PCBs	ASP 95-3	1
Lab QC:			
MS/MSD/MSB	TCL VOCs	ASP 95-1	6
MS/MSD/MSB	TCL SVOCs	ASP 95-2	6
MS/MSD/MSB	TCL PCBs	ASP 95-3	6

TABLE B5-1 (Continued)

MATRIX	SCHEDULE	METHOD	NO. OF SAMPLES
WASTE CHARACTERIZATION			
Samples:	TCLP Extraction	SW 1311	1
	TCLP Volatiles	SW 8260B	1
	TCLP Semivolatiles	SW 8270C	1
	Ignitablity	SW 1030	1
	Reactivity	SW Ch. 7, Section 7.3	1
	Corrosivity	SW 9045C	1

Notes:

MD - Matrix duplicate
MS - Matrix spike
MSD - Matrix spike duplicate
LCS - Laboratory control sample
TB - Trip blank
RB - Rinsate blank
SVOC - Semivolatile organic compound
TCL - Target compound list
TCLP - Toxicity characteristic leachate procedure
VOC - Volatile organic compound
TIC - Tentatively Identified Compound

B6.0 SAMPLE CUSTODY AND HOLDING TIMES

Procedures addressing field and laboratory sample chain-of-custody and holding times are presented in Part A - Field Sampling Plan. Table B4-1 contains sample methods and holding time requirements.

B7.0 ANALYTICAL PROCEDURES

All analyses will be performed in accordance with the following documents:

- New York State Department of Environmental Conservation, (NYSDEC) *Analytical Services Protocol* (ASP), 10/95 Edition.

- United States Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Final Update III*, June 1997.

- Federal Register, 40 CFR, Part 136, App. A.

Table B5-1 identifies the specific methods to be performed on the individual matrices. All holding times begin with validated time of sample receipt (VTSR) at the laboratory.

B8.0 CALIBRATION PROCEDURES AND FREQUENCY

To obtain a high level of precision and accuracy during sample processing procedures, laboratory instruments must be calibrated properly. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following sections describe the analytical support areas and laboratory instrument calibration procedures.

B8.1 Analytical Support Areas

Prior to generating quality data, several analytical support areas must be considered:

Standard/Reagent Preparation - Primary reference standards and secondary standard solutions shall be obtained from National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished according to the methods referenced in Table B4-1. All standards and standard solutions are to be formally documented (i.e., in a bound logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparer's name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

Balances - The analytical balances shall be calibrated and maintained in accordance with manufacture specifications. Calibration is conducted with two Class "S" weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and they must be documented properly in permanently bound logbooks.

Refrigerators/Freezers - The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised and the integrity of the analytical samples is upheld. Appropriate

acceptance ranges (between 2 and 6 degrees Celsius for refrigerators) shall be clearly posted on each unit in service.

Water Supply System - The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) in order to eliminate false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses and ion-exchange treatment is recommended for inorganic analyses. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

B8.2 Laboratory Instruments

Instrument calibration is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet established quantitation limits. Each instrument for organic and inorganic analyses shall be calibrated with standards appropriate to the type of instrument and linear range established within the analytical method(s). Calibration of laboratory instruments will be performed according to methods specified in Table B4-1. In general, standards will be used that bracket the expected concentration of the samples. This will require using different concentration levels that are used to demonstrate the instrument's linear range of calibration.

Calibration of an instrument must be performed before analyzing any samples and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still calibrated. If the contract laboratory cannot meet the method-required calibration, corrective action shall be taken, as discussed in Section B11.0. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

B9.0 INTERNAL QUALITY CONTROL CHECKS

Internal QC checks are used to determine if analytical operations at the laboratory are in control, as well as determining the effect sample matrix may have on data being generated. The type and frequency of specific QC samples performed by the contract laboratory will be according to the specified analytical method and project specific requirements. Acceptable criteria and/or target ranges for these QC samples are presented within the analytical methods referenced in Table B4-1.

QC results which vary from acceptable ranges shall result in the implementation of appropriate corrective measures, the potential application of qualifiers, and/or an assessment of the impact these corrective measures have on the established data quality objectives. Quality control samples, including any project-specific QC, will be analyzed are discussed below.

B9.1 Batch QC

Method Blank Samples - A method blank is defined as laboratory-distilled or deionized water that is carried through the entire analytical procedure. The method blank is used to determine the level of laboratory background contamination. Method blanks are analyzed at a frequency of one per analytical batch.

Matrix Spike Blank Samples - A matrix spike blank (MSB) sample is an aliquot of water spiked (fortified) with all the compounds being analyzed for calculation of precision and accuracy to verify that the analysis being performed is in control. A MSB will be performed for each matrix and organic parameter.

Laboratory Control Samples – A laboratory control sample (LCS) is a known matrix spiked with elements being analyzed for calculation of precision and accuracy to verify that the analysis being performed is in control. An LCS will be performed for each matrix and inorganic parameter.

B9.2 Matrix-Specific QC

Matrix Spike Samples - An aliquot of a matrix is spiked with known concentrations of specific compounds as stipulated by the methodology. The matrix spike (MS) and matrix spike duplicate (MSD) samples are subjected to the entire analytical procedure to assess both accuracy and precision of the method for the matrix by measuring the percent recovery and relative percent difference of the two spiked samples. The samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. MS/MSDs are analyzed at a frequency of one each per 20 samples per matrix. MS/MSDs (an MS for metals only) will be performed for the parameters as listed in Table B5-1.

Matrix Duplicate Samples - The matrix duplicate (MD) is two representative aliquots of the same sample which are prepared and analyzed identically. Collection of duplicate samples provides for the evaluation of precision both in the field and at the laboratory by comparing the analytical results of two samples taken from the same location. Obtaining duplicate samples from a soil matrix requires homogenization of the sample aliquot (except for volatiles) before filling sample containers to best achieve representative samples. Every effort will be made to obtain replicate samples; however, due to interferences, lack of homogeneity, and the nature of the soil samples, the analytical results are not always reproducible. Duplicate samples are to be included at a frequency of one per 20 samples per matrix for metals only, as listed in Table B5-1.

B9.3 Additional QC

Rinsate (Equipment) Blanks - A rinsate blank is a sample of laboratory-demonstrated analyte-free water passed through and over the cleaned sampling equipment. A rinsate blank is used to indicate potential contamination from sample instruments used to collect and transfer samples. This water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. The rinsate blank should be collected, transported, and analyzed in the same manner as the samples acquired that day. Rinsate blanks will be performed at the rate as listed in Table B5-1 for the total number of samples collected throughout the sampling event.

Trip Blanks - Trip blanks are only required when analyzing for volatile organics in aqueous matrices. They consist of a set of 40 ml volatile organic vials filled at the laboratory with laboratory demonstrated analyte free water. The trip blanks then accompany the bottles that are prepared at the laboratory into the field and back to the laboratory, along with the collected samples for analysis. The trip blanks are never opened in the field. Trip blanks will be analyzed for volatile organic parameters only. Trip blanks must be included at a rate of one per aqueous volatile sample shipment, as listed in Table B5-1.

B10.0 CALCULATION OF DATA QUALITY INDICATORS

B10.1 Precision

Precision is evaluated using analyses of a field duplicate and/or a laboratory MS/MSD sample which not only exhibit sampling and analytical precision, but indicate analytical precision through the reproducibility of the analytical results. Relative percent difference (RPD) is used to evaluate precision by the following formula:

$$\% RPD = \frac{(X_1 - X_2)}{[(X_1 + X_2)/2]} \times 100\%$$

where:

X_1 = Measured value of sample or matrix spike

X_2 = Measured value of duplicate or matrix spike duplicate

Precision will be determined through the use of MS/MSD samples for organics and matrix duplicate samples for inorganics analyses. RPD criteria for this project must meet the method requirements referenced in Table B4-1.

B10.2 Accuracy

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. The closer the numerical value of the measurement comes to the true value or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at known concentrations before analysis. Analytical accuracy may be assessed through the use of known and unknown QC samples and spiked samples. Accuracy is presented as percent recovery. Accuracy will be determined from matrix spike, matrix spike duplicate, and matrix spike blank samples, as well as from surrogate compounds added to organic fractions (i.e., volatiles, semivolatiles, PCB), and is calculated as follows:

$$\%\ R = \frac{(X_s - X_u)}{K} \times 100\%$$

where:

X_s	=	Measured value of the spike sample
X_u	=	Measured value of the unspiked sample
K	=	Known amount of spike in the sample

B10.3 Completeness

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$\%\ Completeness = \frac{(X_v - X_n)}{N} \times 100\%$$

where:

X_v	=	Number of valid measurements
X_n	=	Number of invalid measurements
N	=	Number of valid measurements expected to be obtained

B11.0 CORRECTIVE ACTIONS

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem will be filed in the project records, and the information summarized in the case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

B11.1 Incoming Samples

Problems noted during sample receipt shall be documented by the laboratory. URSGWC's QA/QC Officer (or designee) shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

B11.2 Sample Holding Times

If any sample extractions and/or analyses exceed method holding time requirements, URSGWC's QA/QC Officer (or designee) shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

B11.3 Instrument Calibration

Sample analysis shall not be allowed until all initial calibrations meet the appropriate requirements. All laboratory instrumentation must be calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, equipment must be recalibrated and, if necessary, all samples analyzed subsequent to the previously acceptable calibration check will be reanalyzed.

B11.4 Reporting Limits

The laboratory must meet the required detection limits as referenced in the methods listed in Table B4-1. If difficulties arise in achieving these limits due to sample matrix, the laboratory must notify URSGWC project personnel for problem resolution. In order to achieve those detection limits, the laboratory must utilize all appropriate cleanup procedures in an attempt to maintain the project-required detection limits. When any sample requires a secondary dilution due to high levels of target analytes, the laboratory must document all initial analyses and secondary dilution results. Secondary dilution will be permitted only to bring target analytes within the linear range of calibration. If samples are analyzed at a secondary dilution with no target analytes detected, URSGWC's QA/QC Officer (or designee) will be immediately notified so that appropriate corrective actions can be initiated.

B11.5 Method QC

All QC samples, including blanks, matrix duplicates, matrix spikes, matrix spike duplicates, matrix spike blanks, and other method-specified QC samples, shall meet the QC requirements of the methods referenced in Table B4-1. Failure of method-required QC will result in the review and possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed and/or re-extracted/redigested, then reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria as defined by the data validation guidelines identified in Section B12.2. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed and/or re-extracted/redigested, then reanalyzed at no cost to the URSGWC. URSGWC shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

B11.6 Calculation Errors

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review calculation and/or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.

B12.0 DATA REDUCTION, VALIDATION, AND USABILITY

For all NYSDEC ASP analyses, including volatiles, semivolatiles, PCBs, and metals, NYSDEC ASP Superfund deliverable requirements will be employed for documentation and reporting of all data. Analyses for Toxicity Characteristic Leaching Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) characteristics, and for volatiles in accordance with the Federal Register, 40 CFR, Part 136, shall be meet NYSDEC ASP Category B deliverable requirements. The NYSDEC Data Package Summary Forms (see Appendix B-1) will be completed by the analytical laboratory and included in the deliverable data packages.

B12.1 Data Reduction

Laboratory analytical data are first generated in raw form at the instrument. These data may be either in a graphic or tabular format. Specific data generation procedures and calculations are found in each of the referenced methods. Analytical results must be reported consistently. Data for aqueous samples will be reported in concentrations of micrograms per liter (µg/L). Data for soils will be reported in concentrations of micrograms per kilogram (µg/kg) for organics and milligrams per kilogram (mg/kg) for inorganics, and reported on a dry weight basis.

Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or USEPA sources. Data reduction will be performed by individuals experienced with a particular analysis and knowledgeable of requirements.

B12.2 Data Validation

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use.

Data validation will be performed by environmental chemists under the supervision of the QA/QC Officer. All analytical samples collected will receive a limited data review. This review will include: a review of holding times; completeness of all required deliverables; review of QC results (surrogates, spikes, duplicates) to determine if the data are within the protocol required limits

and specifications; a determination that all samples were analyzed using established and agreed upon analytical protocols; an evaluation of the raw data to confirm the results provided in the data summary sheets agree with the quality control verification forms; and a review of laboratory data qualifiers. The methods referenced in Table B4-1, as well as the general guidelines presented in the following documents, will be used to aid the chemist during the data review:

- USEPA Region II, *CLP Organic Data Review*, SOP No. HW-6, Rev. #11, June 1996.

- USEPA Region II, *Evaluation of Metals Data for the Contract Laboratory Program* (CLP) based on SOW 3/90, SOP Revision XI, January 1992.

Where possible, discrepancies will be resolved by URSGWC's chemists (i.e., letters will not be written to the laboratory). A complete analytical data validation is not anticipated. However, if the initial limited data review reveals significant deviations and problems with the analytical data, URSGWC may recommend a complete validation of the data.

B12.3 Data Usability

A Data Usability Summary Report (DUSR) will be prepared following the guidelines presented in the NYSDEC Division of Environmental Remediation's *Guidance for the Development of Data Usability Summary Reports*, June 1999 Revision. The DUSR will describe the samples and the analytical parameters, data deficiencies, analytical protocol deviations, and quality control problems and their effect on the data. The DUSR will also include recommendations on resampling/reanalysis.

B13.0 PREVENTIVE MAINTENANCE

The laboratory is responsible for maintaining its analytical equipment. Preventive maintenance is provided on a regular basis to minimize down-time and the potential interruption of analytical work. Instruments are maintained in accordance with the manufacturer's recommendations. If instruments require maintenance, only trained laboratory personnel or manufacturer-authorized service specialists are permitted to do the work. Maintenance activities will be documented and kept in permanent logs. These logs will be available for inspection by auditing personnel.

B14.0 PERFORMANCE AND SYSTEM AUDITS

Audits will include a careful evaluation of both field and laboratory quality control procedures, and will be performed before or shortly after systems are operational. Performance audits are conducted by introducing control samples into the data production process. These control samples may include performance evaluation samples, or field samples spiked with known amounts of analyte.

Systems audits are onsite qualitative inspections and reviews that provide a quantitative measure of the quality of the data produced by one section of or the entire measurement process. The audits are performed against a set of requirements that may be a quality assurance project plan or work plan, a standard method, or a project statement of work. The primary objective of the systems audits is to verify that the QA/QC procedures are being followed.

B14.1 Performance and External Audits

As part of its established quality assurance program, the laboratory is required to take part in regularly-scheduled performance evaluations and laboratory audits from state and federal agencies. They are conducted as part of the certification process and to monitor the laboratory performance. The audits also provide an external quality assurance check of the laboratory, and provide reviews and information on the management systems, personnel, standard operating procedures, and analytical measurement systems. Acceptable performance on evaluation samples and audits is required for certification and accreditation. The laboratory shall use the information provided from these audits to monitor and assess the quality of its performance. Problems detected in these audits shall be reviewed by the Laboratory QA Manager and Laboratory Management, and corrective action shall be instituted as necessary.

B14.2 Systems/Internal Audits

As part of its quality assurance program, the Laboratory QA Manager shall conduct periodic checks and audits of the analytical systems. The purpose of these is to verify that the analytical systems are working properly, and that personnel are adhering to established procedures and documenting the required information. These checks and audits also assist in determining or detecting where problems are occurring.

The Laboratory QA Manager periodically will submit laboratory control samples. These samples will serve to check the entire analytical method, the efficiency of the preparation method, and the analytical instrument performance. The results of the control samples are reviewed by the Laboratory QA Manager who reports the results to the analyst and the Laboratory Director. When a problem is indicated, the Laboratory QA Manager will assist the analyst and laboratory management in determining the reason and in developing solutions. The Laboratory QA Manager also will recheck the systems as required.

REFERENCES

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Quality Assurance Manual, Final Copy , Revision I, October 1989.

National Enforcement Investigations Center of USEPA Office of Enforcement. *NEIC Policies and Procedures.* Washington: USEPA.

New York State Department of Environmental Conservation. 1995. *Analytical Services Protocol,* October. Albany, NY..

New York State Department of Environmental Conservation. 1999. Division of Environmental Remediation, *Guidance for the Development of Data Usability Summary Reports.* June. Albany, NY.

United States Environmental Protection Agency (USEPA). 1987. *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87-001, (OSWER Directive 9355.0-14). December. Cincinnati, OH: USEPA.

URS. 2000. Project Management Work Plan. July. Buffalo, NY.

USEPA. 1993. Data Quality Objectives Process for Superfund, Interim Final Guidance. September. Washington: USEPA.

USEPA. 1992. *Evaluation of Metals Data for the Contract Laboratory Program (CLP) based on SOW 3/90, HW-2 (SOP Revision XI).* 30 January. USEPA Region II.

USEPA. 1996. *Contract Laboratory Program Organic Data Review, SOP No. HW-6, Revision 11.* June. USEPA Region II.

APPENDIX B-1

NYSDEC DATA PACKAGE SUMMARY FORMS

To be included with all lab data and with each workplan

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		*VOA GC/MS Method #	*BNA GC/MS Method #	*VOA GC Method #	*Pest PCBs Method #	*Metals	*Other

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOLATILE (VOA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Metals Requested	Date Rec'd at Lab	Date Analyzed

PART C

HEALTH AND SAFETY PLAN (HASP)

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APPENDICES

A Waste Site Worker Training Programs

B Field Activity Forms

C Standard Operating Safety Procedures

ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
F	degrees Fahrenheit
HASP	Health and Safety Plan
HEPA	high efficiency particulate air
HSO	Health and Safety Officer
LEL	lower explosive limit
NIOSH	National Institute for Occupational Safety and Health
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
ppm	parts per million
TVA	total vapor analyzer
URSGWC	URS Greiner Woodward Clyde
USEPA	United States Environmental Protection Agency

C1.0 INTRODUCTION

This *Health and Safety Plan* (HASP) includes appropriate health and safety procedures to be followed during investigative activities at and in the vicinity of the former Dinaburg Distributing, Inc. Site in the City of Rochester, Monroe County, New York, under New York State Department of Environmental Conservation (NYSDEC) State Superfund Work Assignment No. D003825-26 to URS Greiner Woodward Clyde, Inc. (URSGWC). Anticipated field activities at the site will include:

- Setting up support facilities/mobilization
- Land surveying
- Geophysical Survey (Utility Survey)
- Soil and Sewer Sampling
- Advancing borings, installing and developing piezometers, groundwater monitoring and recovery wells
- Collecting groundwater samples
- Groundwater Pump Test
- Soil Vapor Extraction Pilot Test
- Real-time air monitoring
- Staging/disposing of investigation-derived waste

The procedures presented in this plan comply with the following regulatory or guidance documents:

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH-0027 (1998) *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*

ACGIH-0375 (1999) *Guide to Occupational Exposure Values*

ACGIH-0460 *Guidelines for the Selection of Chemical Protective Clothing*, 3rd Edition

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1904 "Recording and Reporting Occupational Injuries and Illnesses"

29 CFR Part 1910 "Occupational Safety and Health Standards," especially Part 1910.120- Hazardous Waste Site Operations and Emergency Response"

29 CFR Part 1926 "Safety and Health Regulations for Construction," especially Part 1926.65 - "Hazardous Waste Site Operations and Emergency Response"

49 CFR Part 171 "General Information, Regulations, and Definitions"

49 CFR Part 172 "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements"

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

No Publication No. (1984) *Standard Operating Safety Guides*, Office of Emergency and Remedial Response

USEPA Order 1440.2 (1981) *Health and Safety Requirements for Employees Engaged in Field Activities*

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115 - (October 1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

URSGWC personnel who will be involved in intrusive activities on site have completed the appropriate waste site worker training as required by Occupational Safety and Health Administration OSHA 29 CFR 1910.120(e)(2), 1910.120(e)(3), and 1910.120(e)(8), as applicable, and the required medical surveillance as required by OSHA 1910.120(f). Copies of training certificates and medical surveillance certification for all URSGWC field personnel will be maintained on site.

C2.0 RESPONSIBILITIES

The following is a summary of the health and safety responsibilities of various project personnel.

C2.1 Project Health and Safety Officer

The responsibilities of the Project Health and Safety Officer (HSO) are to develop and coordinate the site health and safety program, and to provide necessary direction and supervision to the Site HSO. The Project HSO will contact the local health department, hospital, police, and fire departments prior to the initiation of work at the sites. This individual will conduct the initial site-specific training session (onsite health and safety briefing), and will review and confirm changes in personal protection requirements when site conditions are found to be different from those originally anticipated.

The Project HSO will be involved in all discussions on health and safety matters with the NYSDEC, OSHA, local health authorities, or other governmental or labor representatives. In addition, this individual will provide the Site HSO with details concerning the task-specific health and safety considerations. The Project HSO reports directly to the Project Manager and the Corporate Health and Safety Director.

C2.2 Site Health and Safety Officer

The responsibilities of the Site HSO are as follows:

- Implement this HASP
- Enforce day-to-day health and safety protocols in effect on the site
- Require that all URSGWC workers who will be involved in intrusive activities on the site have had appropriate waste site worker training and medical examinations, and review and maintain training and medical certifications on site
- Require that all personnel entering the site understand the provisions of this HASP

- Conduct periodic training sessions in proper use and maintenance of personal protective equipment and safety practices
- Conduct periodic emergency response drills
- Conduct daily health and safety meetings each morning
- Direct and advise onsite URSGWC personnel, visitors, and subcontractor HSO on all aspects, especially changes, related to health and safety requirements at the site
- Conduct necessary health and safety monitoring
- Administer the air monitoring program
- Monitor site conditions and determine all necessary changes in levels of personal protection and, if warranted, execute work stoppages
- Report changes in site conditions and changes in personal protection requirements to the Project HSO
- Prepare accident/incident reports

The Site HSO reports directly to the Project HSO. URSGWC will designate a qualified backup for the Site HSO prior to the initiation of onsite activities.

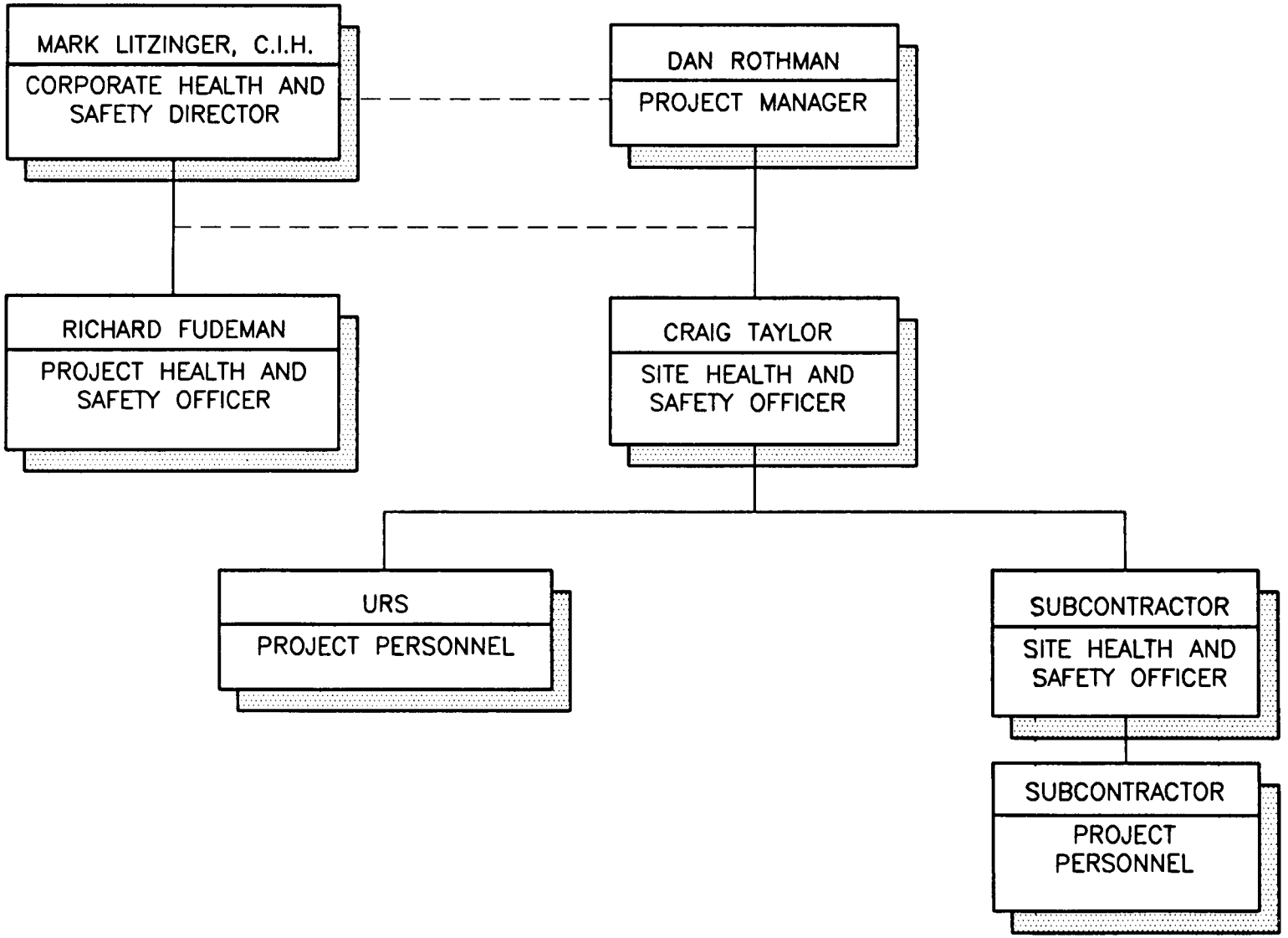
C2.3 Field Team Personnel

Field team personnel will be responsible for understanding and complying with site health and safety requirements. At least two members of the project field team on site will be trained in first aid and cardiopulmonary resuscitation (CPR), and will be certified by the American Red Cross. Field team personnel will have completed the required waste site worker training to comply with 29 CFR, Part 1910.120.

A chain-of-command chart for implementation of this HASP is presented in Figure C2-1.

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URS Greiner Woodward Clyde

HEALTH AND SAFETY CHAIN-OF-COMMAND

FIGURE C2-1

C3.0 SITE HISTORY AND BACKGROUND

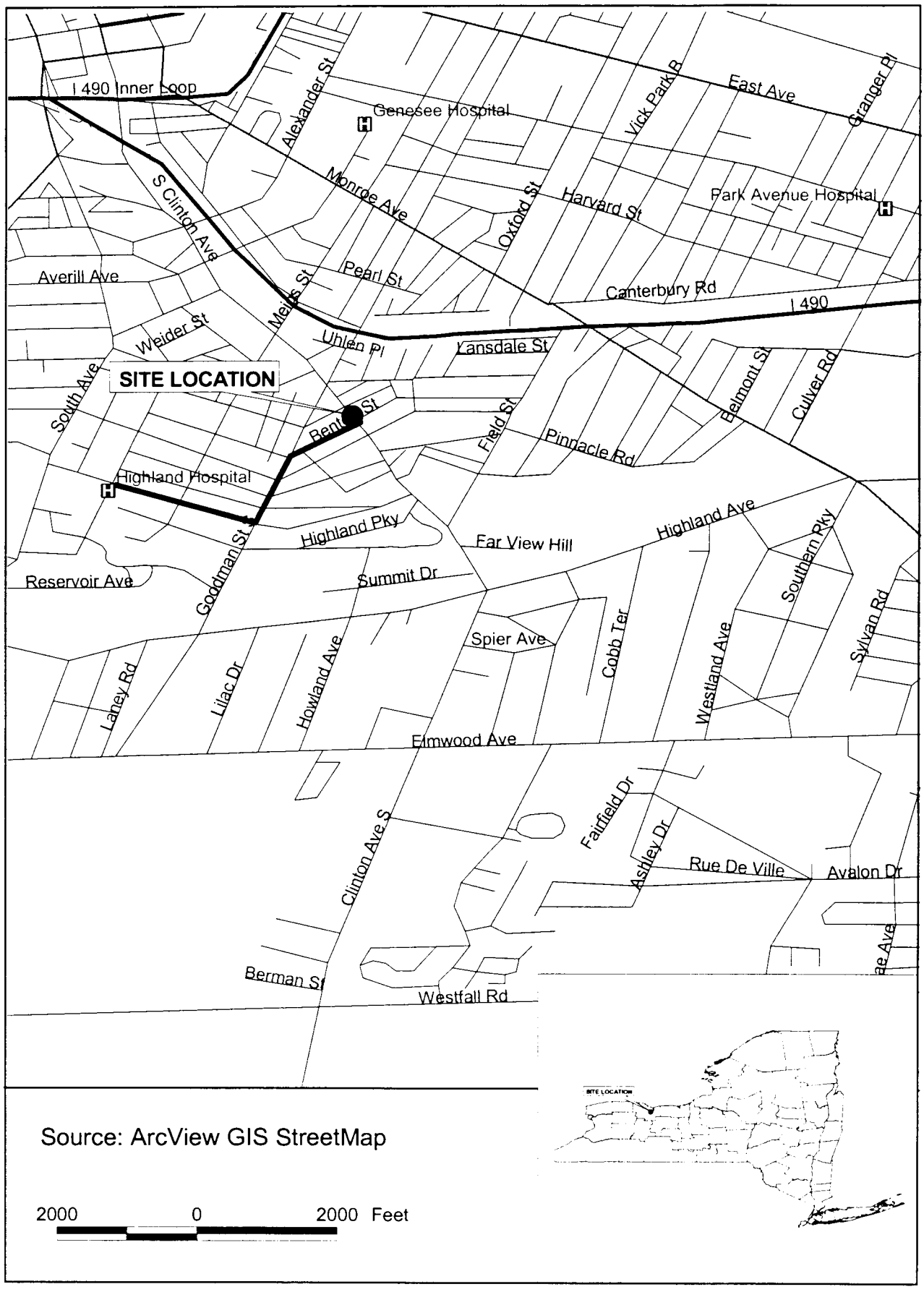
Site Description

Former Dinaburg Distributing, Inc. is a Class 2 site, listed on the NYSDEC Registry of Inactive Hazardous Waste Sites (NYSDEC Site No. 8-28-103). The site is located at 1012 South Clinton Avenue, City of Rochester, Monroe County, New York (Figure C3-1). The property is in a mixed commercial/residential area just inside the Rochester City limits. The site is located on the east side of South Clinton Street. The site occupies about 0.25 acres on two parcels orientated perpendicular to one another, and consists of a three connected buildings/structures, an asphalt parking area adjacent to South Clinton Avenue, and a driveway area which provides access to Benton Street (the driveway and parking area do not connect). The site layout is shown in Figure C3-2.

The site geology consists of approximately 20 feet of overburden overlying Silurian age dolomite (calcium-magnesium carbonate) bedrock. The overburden consists of a thin layer of fill (1.0-5.0 feet) overlying naturally occurring unconsolidated deposits of sand, silt and glacial till. Groundwater is typically found between 7.5 and 13.0 feet below ground surface (bgs) with elevations between 500 and 505 feet above mean sea level (AMSL) and flows radially outward from the site to the west.

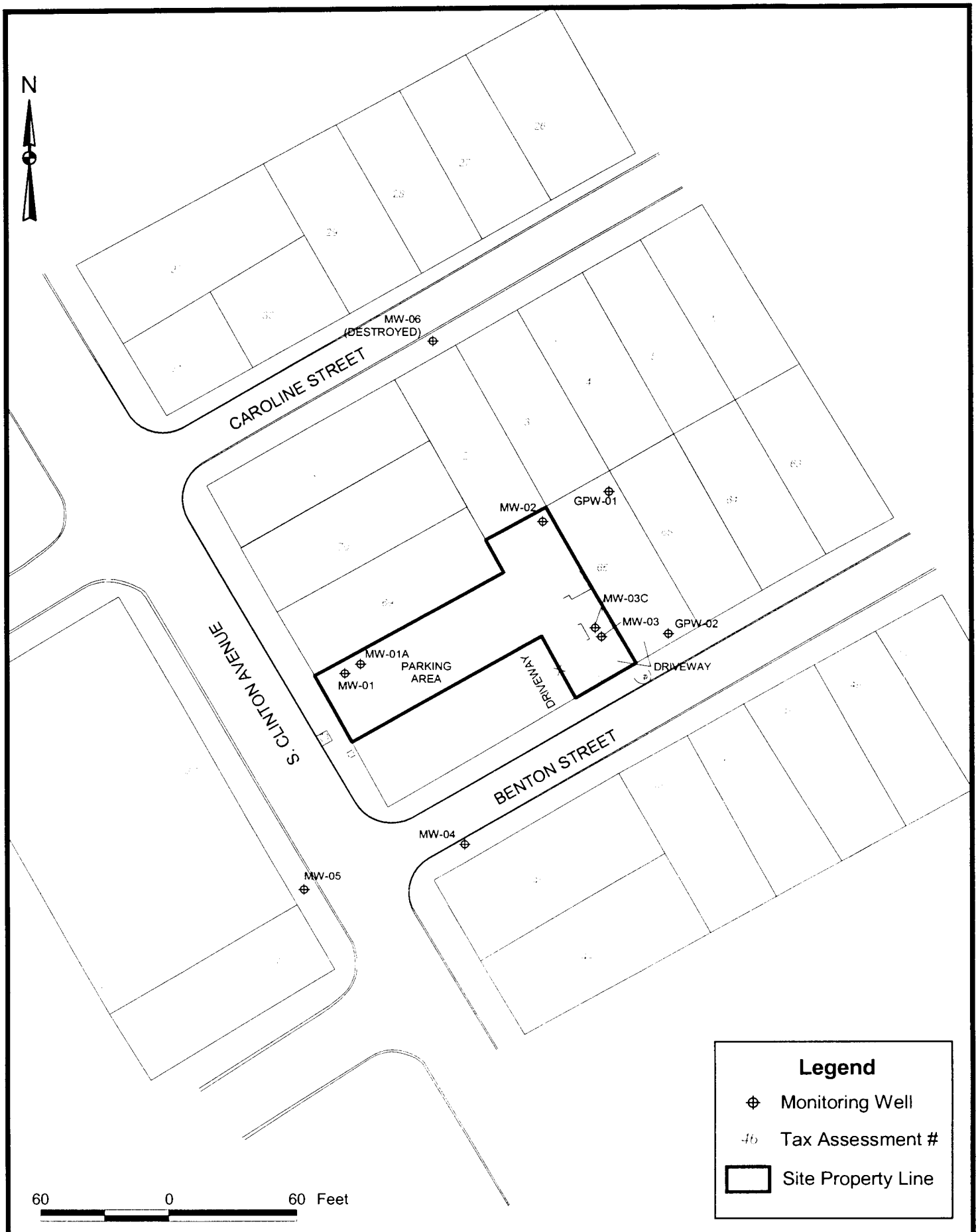
Site History

The property and buildings were reportedly used as an automobile repair shop from circa 1950 to circa 1969. A hydraulic lift, with two cylinders, was used by the former auto repair businesses and is still present inside the building. A floor drain is located adjacent to the hydraulic lift. From circa 1971 to circa 1993, the site was occupied by Dinaburg Distributing, Inc., which operated a dry cleaning supply business. Aboveground Storage Tanks (ASTs) were located inside in the northeast area of the site building and were used for the storage of dry cleaning fluids. The facility is currently inactive and unoccupied.



URS Greiner Woodward Clyde	FORMER DINABURG DISTRIBUTING SITE LOCATION MAP	FIGURE C3-1

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URS Greiner Woodward Clyde	FORMER DINABURG DISTRIBUTING SITE PLAN	FIGURE C3-2

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C4.0 TRAINING REQUIREMENTS

All personnel conducting field activities on site are required to be certified in health and safety practices for hazardous waste operations as specified in the federal OSHA Regulations (29 CFR 1910.120) (revised March 6, 1990). Paragraph (e) (2) of the above-referenced regulations requires that each employee, at the time of job assignment, receive a minimum of 40 hours of initial instruction off the site, and a minimum of three days of supervised field experience.

Paragraph (e) (3) of the above-referenced regulations requires that all onsite management and supervisory personnel directly responsible for, or who supervise employees engaged in hazardous waste operations, must initially receive eight hours of additional specialized training. Management and supervisory training must emphasize health and safety practices related to managing hazardous waste work.

Paragraph (e)(8) of the above-referenced regulations requires that workers and supervisors must receive eight hours of refresher training annually on the items specified in Paragraph (e)(1) and/or (e)(3).

Additionally, all personnel must receive adequate site-specific training in the form of an onsite health and safety briefing given by the Project HSO prior to participating in onsite field work. This will involve a review of this HASP with emphasis on the following:

- Protection of the adjacent community from hazardous substances which may be released during intrusive activities
- Attention to health effects and hazards of substances known to be present on site
- Attention to physical hazards on site, and the importance of knowing proper means of avoiding these hazards

- Health hazards, protective measures, emergency and first aid measures, fire and explosion information, reactivity, incompatible materials, and emergency procedures for spills of hazardous chemicals brought onto the site for use during normal field operations

- Hazards and protection against heat/cold

- The need for vigilance in personal protection, and the importance of attention to proper use, fit, and care of personal protective equipment

- The effectiveness and limitations of personal protective equipment

- Prescribed decontamination procedures

- Site control, including work zones, access, and security

- The proper observance of daily health and safety practices, such as the entry and exit of work zones and the site, proper hygiene during lunch, break, etc.

- Recognition in oneself or in others of physical conditions requiring immediate medical attention, and application of simple first aid measures

- Emergency procedures to be followed (with rehearsals) in cases of fire, explosion, or sudden release of hazardous gases.

The NYSDEC shall be notified when such site-specific training sessions are to be conducted.

Health and safety meetings will be conducted daily by the Site HSO and will cover protective clothing and other equipment to be used that day, potential chemical and physical hazards, emergency procedures, and conditions and activities from the previous day.

All visitors entering the Exclusion Zone or Contamination Reduction Zone will be required to receive the necessary site-specific training from the Site HSO and must be equipped with the proper personal protective equipment (see Section C7.0 for a discussion of the work zones).

C5.0 MEDICAL SURVEILLANCE REQUIREMENTS

All URSGWC personnel who engage in onsite activities for 30 days or more per year participate in the Medical Surveillance Program which involves undergoing an annual medical examination. The examination must be conducted by a physician who is board-certified in occupational medicine. The physician will have been made familiar with the job-related duties of each worker examined. All URSGWC project personnel involved in onsite activities in the Exclusion Zone at the site participate in the Medical Surveillance Program.

Components of the Medical Surveillance Program are shown in Table C5-1. The physician must state whether the individual is fit to conduct work on hazardous waste sites using personal protection, or whether he or she must work within certain restrictions. Personnel may be excluded from this site for medical reasons. Copies of medical examination reports are given to each employee who are encouraged to forward copies to their personal physician.

Any person exposed to high levels of hazardous substances will be required to undergo a repeat medical exam at or before the conclusion of the project to determine possible health impacts. Any person suffering a lost-time injury or illness must have medical approval prior to returning to work on site. When employment is terminated for any reason, the employee must receive an exit medical examination.

All medical records will be held by the employer for the period of employment plus at least 30 years, in accordance with OSHA regulations on confidentiality and any other applicable regulations and will be made available to OSHA upon request.

TABLE C5-1
COMPONENTS OF MEDICAL SURVEILLANCE PROGRAM

- Medical and occupational history
- Physical examination, with particular attention to the cardiopulmonary system, general physical fitness, skin, blood-forming, hepatic, renal, and nervous systems
- Urinalysis, to include:
  - color
  - appearance
  - specific gravity
  - pH
  - ketones
  - protein
  - glucose
  - blood
  - bilirubin
  - leukocyte esterase
  - nitrite
  - WBC
  - RBC
  - casts
  - bacteria
  - epithelial cells
  - crystals
  - yeasts
- Blood analysis, to include:
  - complete blood count
  - hemoglobin
  - albumin, globulin, total protein
  - bilirubin - direct and total
  - g-glutamyl transpeptidase
  - serum glutamic oxalacetic transaminase
  - lactic dehydrogenase
  - alkaline phosphatase
  - sodium
  - potassium
  - chloride
  - magnesium
  - calcium
  - phosphorus
  - uric acid
  - BUN (blood urea nitrogen)
  - creatinine
  - cholesterol
  - triglycerides
  - glucose
  - iron
  - heavy metals - arsenic, lead, mercury, and zinc protoporphyrin
- Pulmonary function test
- Additional tests as appropriate, including:
  - chest X-ray
  - electrocardiogram
  - stress test

C6.0 SITE HAZARD EVALUATION

C6.1 Chemical Hazards

The primary chemicals of concern are volatile organic compounds (benzene, 1,2-dichloroethylene, ethylbenzene, polychlorinated biphenyl's (PCBs), tetrachloroethylene, toluene, 1,1,1-trichloroethane, trichloroethylene (TCE) and xylene. The health and safety characteristics and occupational exposure values of these and other chemicals potentially present on site are summarized in Table C6-1. The risk of exposure to these contaminants can be by the dermal or respiratory route, depending on the type of compound and activity being conducted.

C6.2 Physical Hazards

Physical hazards range from the dangers of tripping and falling on uneven ground to those associated with the operation of heavy equipment such as drill rigs. During site activities, workers may have to work on drilling equipment by climbing the mast. The drilling subcontractor will conform with any applicable OSHA and NIOSH recommendations for climbing activities. These activities will be overseen by the subcontractor drilling supervisor and URSGWC field geologist.

Field activities that involve drilling usually involve contact with various types of machinery. At least two people on site must be currently American Red Cross-certified in first aid and CPR. Personnel trained and certified in first aid should be prepared to take care of cuts and bruises as well as other minor injuries. A first aid kit approved by the American Red Cross will be present and available during all field activities.

Some animals and insects may bite and thereby pose a health hazard in the form of irritation, illness, or poisoning. Anyone bitten should be given immediate first aid as necessary, and shall be transported to the nearest medical facility (if necessary). Members of the field investigation team will be properly briefed regarding the potential for encountering animals and insects. The potential threat of the deer tick and the possibility of contracting Lyme disease is a serious matter. The likelihood of contracting Lyme disease will be greatly decreased by field personnel wearing long

TABLE C6-1
HAZARD CHARACTERISTICS OF POTENTIALLY PRESENT CONTAMINANTS OF CONCERN
FORMER DINABURG DISTRIBUTING SITE

SUBSTANCE	TOXICITY/CARCINOGENICITY	OCCUPATIONAL EXPOSURE VALUES*
Benzene	Confirmed human carcinogen. Toxic by ingestion, inhalation, and skin adsorption. Irritant to eyes, nose, and throat.	0.5 ppm (Skin) (1)(TLV-TWA) 2.5 ppm (STEL)(2)(TLV) 1 ppm (PEL) 5 ppm (STEL)(2)(PEL)
1,2-Dichloroethylene	Moderately toxic by ingestion, inhalation, and skin contact. Irritant and narcotic in high concentrations.	200 ppm (TLV-TWA and PEL)
Ethylbenzene	Moderately toxic by ingestion and skin adsorption. Irritant to skin and eyes. Confirmed animal carcinogen.	100 ppm (TLV-TWA and PEL) 125 ppm (STEL) (2) (TLV)
Polychlorinated Biphenyls (PCBs)	Highly toxic. Suspected human carcinogen.	0.5 mg/m^3(Skin) (1) (TVL-TWA and PEL) (1254) mg/m^3 (Skin) (1) (TLV-TWA and PEL) (1242)
Tetrachloroethylene (Perchloroethylene)	Moderately toxic. Irritating to skin and eyes. Confirmed animal carcinogen.	25 ppm (TLV-TWA) 100 ppm (PEL) 100 ppm (STEL) (2) (TLV) 200 ppm (Ceiling) (3) (PEL)
Toluene	Moderate toxicity via the oral, inhalation, and intraperitoneal routes, low toxicity via the dermal route.	50 ppm (Skin) (1) (TLV-TWA) 200 ppm (PEL) 300 ppm (Ceiling) (3) (PEL)
1,1,1-Trichloroethane	Irritating to eyes and tissue.	350 ppm (TLV-TWA and PEL) 450 ppm (STEL) (2) (TLV)
Trichloroethylene	Toxic by inhalation.	50 ppm (TLV-TWA) 100 ppm (STEL) (2) (TLV) 100 ppm (PEL) 200 ppm (Ceiling (3) (PEL)
Vinyl Chloride	Confirmed human carcinogen.	1 ppm (TLV-TWA and PEL) 5 ppm (STEL) (2) (PEL)

TABLE C6-1 (Continued)

Notes

* PELs are 8-hour Time-Weighted Averages (TWAs) unless otherwise noted.

(1) "Skin" Notation ? Listed substances followed by the designation ?Skin? refer to the potential significant contribution to the overall exposure by the cutaneous route, including mucous membranes and the eyes, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. Vehicles present in solutions or mixtures also can enhance potential skin absorption significantly. It should be noted that while some materials are capable of causing irritation, dermatitis, and sensitization in workers, these properties are not considered relevant when assigning a skin notation. It should be noted, however, that the development of a dermatological condition can significantly affect the potential for dermal absorption.

(2) STEL - Short Term Exposure Limit ? 15-minute TWA exposure which should not be exceeded at any time during a work day.

(3) Ceiling - The concentration that should not exceeded during any part of the working exposure.

Definitions

Threshold Limit Values (TLVs) - Refers to airborne concentrations of substances as issued by the American Conference of Governmental Industrial Hygienists (ACGIH) and represents conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Threshold Limit Value - Time-Weighted Average (TLV-TWA) - The Time-Weighted Average concentration as issued by ACGIH for a normal 8-hour work day and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Threshold Limit Value - Short-Term Exposure Limit (TLV-STEL) - The maximum concentration as issued by ACGIH to which workers can be exposed continuously for a short period of time (up to 15 minutes) without suffering from 1) irritation, 2) chronic or irreversible tissue damage, or 3) narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially reduce work efficiency.

Permissible Exposure Limits (PELs) - Exposure limits that are enforceable by the Occupational Safety and Health Administration (OSHA) as legal standards and cannot be exceeded over an 8-hour exposure.

ppm - parts per million

mg/m^3 - milligrams per cubic meter

TABLE C6-1 (Continued)

References

American Conference of Governmental Industrial Hygienists. *1999 Guide to Occupational Exposure Values*. Cincinnati, Ohio.

29 CFR, Part 1910.1000, Tables Z-1 and Z-2, Limits for Air Contaminants, July 1, 1995.

American Conference of Governmental Industrial Hygienists. *1999 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, Cincinnati, Ohio.

Hawley, Gessner G. *The Condensed Chemical Dictionary*, Tenth Edition, New York: Van Nostrand Reinhold, 1981.

Sax, R. Irving. *Dangerous Properties of Industrial Materials*, Sixth Edition, New York: Van Nostrand Reinhold, 1984.

pants, long-sleeved shirts, and hard hats. All field personnel will be instructed to take a shower daily upon returning to the hotel or place of residence to further decrease the likelihood of contracting Lyme disease.

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers in the drilling program will often be required to lift heavy objects (drill casings, auger flights, etc.). Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

C6.3 Temperature Stress

A Heat/Cold Stress Log will be kept and maintained on a daily basis for all personnel wearing protective ensembles on site.

C6.3.1 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel which limits the dissipation of body heat and moisture can cause heat stress. The Site HSO is responsible for monitoring heat stress in the field team personnel.

The following prevention, recognition, and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress, and to apply the appropriate treatment.

A. Prevention

1. Provide plenty of liquids. Available in the Support Zone will be a 50 percent solution of fruit punch in water, or the like, or plain water.

2. Provide cooling devices. A portable, pump-activated sprayer and containers of tap water will be available in the Contamination Reduction

Zone to reduce body temperature, cool protective clothing, and/or act as a quick-drench shower in case of an exposure incident.

3. Adjustment of the work schedule. During the hot summer days, labor-intensive tasks which pose a high potential risk of heat stress can be performed during the coolest part of the day.

B. Recognition and Treatment

Any person who observes any of the following forms of heat stress, either in themselves or in another worker, will report this information to the Site HSO immediately after implementing treatment, if possible.

1. Heat Rash (prickly heat):

Cause:	Continuous exposure to hot and humid air, aggravated by chafing clothing.
Symptoms:	Eruption of red pimples around sweat ducts, accompanied by intense itching and tingling.
Treatment:	Remove source of irritation and cool the skin with water or wet cloths.

2. Heat Syncope (fainting):

Cause:	Sun rays beating down on victim's head and prolonged upright position can lead to mild dehydration and contraction of the blood vessels resulting in a temporary deficiency of blood to the brain.
Symptoms:	Brief loss of consciousness.

Treatment: Worker should assume a horizontal position and drink 2 liter to 1 liter of fluid (not alcohol). Elevate the legs and cover the head.

3. Heat Cramps (heat prostration):

Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: Sudden development of pain and/or muscle spasms in the abdominal region.

Treatment: Move the worker to the Contamination Reduction Zone. Remove protective clothing. Provide fluids orally. Decrease body temperature and allow a period of rest in a cool location.

4. Heat Exhaustion (heat toxemia, sunstroke):

Cause: Overexertion in a hot environment and profuse perspiration accompanied by inadequate replenishment of body water and electrolytes. A serious condition.

Symptoms: Muscular weakness, tiredness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.

Treatment: Perform the following while simultaneously making arrangements for transport to a medical facility: Move the worker to the Contamination Reduction Zone. Remove protective clothing. Lie the worker down on his or her back, in a cool place, and raise the feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of a salt water solution using one teaspoon of salt in

12 ounces of water. Transport the worker to a medical facility.

5. Heat Stroke:

Cause: Same as heat exhaustion. An extremely serious condition.

Symptoms: Dry, red, hot skin, dry mouth, dizziness, nausea, headache, rapid pulse. Temperature continues to rise unless treatment is implemented.

Treatment: The basic principle is to lower the body temperature rapidly.

1. Move the victim out of the sun.
2. Remove clothes.
3. Soak victim completely with water, wet hair as well.
4. Place victim in front of a fan or in a breeze, if possible.
5. If ice is available, apply directly to the victim, especially under the arms and on the head.
6. Monitor body temperature with available thermometers. Temperature should start to decrease within minutes.
7. As temperature approaches 101 degrees Fahrenheit (°F), stop cooling measures and initiate transport to a hospital or declare an emergency response. The temperature should continue to fall, often to subnormal, during this period.

Other considerations in treating heat stroke are:

1. Rub skin briskly during cooling process.
2. If cardiac arrest occurs, perform CPR (ONLY IF CERTIFIED) and continue cooling.
3. If a seizure occurs, continue cooling; the seizure will stop.
4. No drugs of any kind are to be given to the victim.

C. Heat Stress - Predisposing Factors

Preventing heat stress is clearly preferred to treatment. The following factors increase the individual's risk of heat stress:

- Physically unfit
- Age
- Not accustomed to heat
- Sunburn
- Alcohol and drugs
- Dehydration
- Heavy or non-breathable clothing
- Not covering one's head

C6.3.2 Cold Stress

Personnel can be susceptible to cold stress while conducting field work during cold weather months. To guard against cold stress and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be previously identified and readily available, rest periods should be adjusted as needed, and the physical conditions of onsite field personnel should be closely monitored. All personnel working onsite must be able to recognize the signs and symptoms of cold stress and apply first aid as needed. The Site HSO is responsible for monitoring the signs and symptoms of cold stress among field personnel.

The development of cold stress and cold injuries is influenced by three factors: the ambient temperature, the velocity of the wind, and the amount of sunshine. Fingers, toes, and ears are the most susceptible parts of the body affected by cold.

A. Frost Nip:

Frost nip is the first sign of frost bite and is the only form of local cold injury that can be definitively treated in the field.

Symptoms: A whitened area of the skin which is slightly burning or painful.

Treatment: Rewarming the affected part.

B. Frost Bite: Local damage is caused by exposure to low temperature environmental conditions. It results at temperatures when ice crystals form, either superficially or deeply, in the fluids and underlying soft tissues of the skin. The nose, cheeks, ears, fingers, and toes are most commonly affected.

Symptoms: Skin is cold, hard, white, and numb. There may also be blisters. The affected parts will feel intensely cold; however, there may not be any pain. The victim may not know that he or she is frost-bitten.

As time goes on, the victim may experience mental confusion and impairment of judgment. The victim may stagger and eyesight may fail. The victim may fall and become unconscious. Shock is evident and breathing may cease. If death occurs, it is usually due to heart failure.

Treatment: Generally, definitive thawing should not be performed in the field, because if re-freezing occurs, it could result in severe damage. The victim should be transported to a medical facility after the following measures are instituted:

Do Not:

- Do not walk on a thawed foot or toes or use thawed hands.
- Do not allow victim to smoke or drink alcohol.
- Do not rub affected area with anything.
- Do not break any blisters.
- Do not apply heat of any kind.

Do:

- Do place victim in protected environment.
- Do prevent further heat loss (warmer clothes).
- Do protect from further damage (warm covering).

C. Mild Hypothermia

Symptoms: The single most important sign of mild hypothermia is a change in behavior. Some signs that can be observed are:

- Decrease in work efficiency
- Decreased level of communication
- Forgetfulness
- Poor judgment
- Poor motor skills (difficulty in handling objects, dropping tools)

The target organ of mild hypothermia is the brain. During mild hypothermia, most of the body's protective mechanisms for temperature control are intact. Shivering is usually present and "goose flesh" and pale skin persist. When asked directly, the victim will usually say that he feels cold. A worker impaired by mild hypothermia can be a danger to himself and co-workers.

Treatment:

- The victim should be moved indoors or into a heated vehicle.
- Remove all wet or damp clothing, dry skin, and apply dry clothing.
- The head should be covered with a hat or blanket.
- Blankets should be put on the victim.
- The victim should be given hot fluids (no alcohol).
- If possible, monitor the victim's temperature at 15 minute intervals.

D. Moderate Hypothermia

For field purposes, this may be defined as the stage at which the patient is clearly incapable of functioning effectively, but is conscious.

Symptoms: The victim's body temperature is well below normal and some mental changes may occur which include:

- Disorientation to people, place, and time
- Hallucinations
- Inappropriate laughing or crying
- Bizarre behavior for that individual

During moderate hypothermia, shivering is absent, "goose flesh" disappears, and the heart rate may slow down. The victim does not "feel" cold.

Treatment:

- First, treat the patient for mild hypothermia
- Provide warming with hot blowers or heaters
- Use human body heat

- Watch for signs of returning to normal (e.g., shivering, goose flesh, teeth chattering)
- Monitor mental status

After these steps are initiated, the victim should be taken to a medical facility. The patient should not return to work for at least 48 hours.

E. Severe Hypothermia

Symptoms: Characterized by a decrease in the body temperature which results in a deep coma in which even vital signs become very weak and finally undetectable. Most occupational cases occur when the victim is alone or lost. These victims, for all practical purpose, appear to be dead, but the saying "not dead until warm and dead" applies to severe hypothermia. Many of these victims can survive.

Treatment:

- The patient is not to be considered dead.
- Remove wet clothes, dry skin, and apply dry clothes.
- Activate rewarming.
- Prepare to transfer the victim to a medical facility.
- If the patient is pulse-less and is not breathing, perform CPR (ONLY IF CERTIFIED), while enroute to the medical facility.
- Very cold victims often tolerate long periods of arrest, even without CPR. The victim must be handled very carefully because of extreme susceptibility to even minor trauma.

C7.0 SITE CONTROL

To keep unauthorized personnel from entering the work area during drilling, or environmental sampling activities, and for good control of overall site safety, three work zones will be established. These zones are the Support Zone, the Contamination Reduction Zone, and the Exclusion Zone. Actual Exclusion Zone size will be determined by the optimal size of work area and by local obstructions.

C7.1 Support Zone

The Support Zone for the Dinaburg Site will be the area where support facilities, such as the equipment storage shed, will be located. The office and equipment storage shed will contain personal protective equipment (disposable suits, gloves, boots, etc.), a first aid kit, a fire extinguisher, a stretcher, sampling equipment, sample containers, 50 percent solution of fruit punch or the like in water (or plain drinking water), and self-contained breathing apparatus.

C7.2 Contamination Reduction Zones

A Mobile Contamination Reduction Zone will lie adjacent to each active drilling Exclusion Zone. During drilling operations, materials brought to the surface may come in contact with workers' boots or protective clothing and equipment. A mobile decontamination area will be set up adjacent to the active drilling area. All personnel in the active drilling area will be required to decontaminate themselves and light equipment prior to leaving the active drilling Exclusion Zone.

C7.3 Exclusion Zone

The Exclusion Zone is the area around each active drilling or sampling location. The exact size of this active Exclusion Zone will be determined by optimal size of work area and by local obstructions. All personnel leaving the active or Exclusion Zone will be required to do so via the Mobile Contamination Reduction Zone, and to carry out proper decontamination procedures.

C7.4 Site Visitation

It is expected that officials from the NYSDEC and other regulating bodies and jurisdictions will visit the site during operations. It is also possible that an OSHA representative will wish to inspect the operations. All such officials must meet the same requirements as onsite workers (OSHA-approved training, site-specific training, and medical surveillance) before going into any Exclusion Zone. All visitors must read this HASP prior to entering an Exclusion Zone. Visitors other than the NYSDEC, OSHA, New York State Department of Health (NYSDOH), or town or county government representatives will be subject to the additional requirement of having to receive written permission from the NYSDEC to enter an Exclusion Zone. A Daily Site Visitors Log will be kept and all visitors to the site will sign in and provide their affiliation, the date of visit, affirmation that they have read and understood the HASP, arrival time, departure time, and purpose of visit.

C8.0 PERSONAL PROTECTION

Since personnel working on site may be exposed to chemical contaminants released during intrusive activities, or may come in contact with contaminants in wastes, drill cuttings, or soils, various levels of protection must be available. Components of all levels of personal protection that will be available are listed in Table C8-1. The anticipated levels of protection for various field activities are given in Table C8-2.

In the event that unexpected levels of organic vapors are encountered, any personnel working at Level D protection will don their respirators (change to Level C). The Site HSO will consult with the Project HSO to decide if and when Level D protection may be resumed, or if a higher level of personal protection is required.

Some modification in safety equipment (e.g., switching from poly-coated disposable coveralls to standard disposable coveralls) may be implemented to balance concerns for full contaminant protection against concerns for the possibility of heat stress resulting from the need to wear more restrictive protective equipment. Such modifications may be implemented only if approved in advance by the Site HSO, following consultation with the Project HSO. Protective equipment which fully complies with the requirements of all required levels of protection will be immediately available at all times on the site.

Level C respiratory protection normally will be provided using NIOSH-approved full-face respirators, with high-efficiency particulate air (HEPA) combination filter cartridges approved for removing organic vapors, particulates, gases, and fumes. The HEPA filter cartridges will be changed at the end of each work day or when breakthrough occurs, whichever comes first. All URSGWC field team members will have been fit-tested for respirators using irritant smoke prior to project assignment. Due to difficulties in achieving a proper seal between face and mask, persons with facial hair will not be allowed to work in areas requiring respiratory protection.

TABLE C8-1
COMPONENTS OF PERSONAL PROTECTION LEVELS
DINABURG DISTRIBUTING SITE

Level D Protection	Level C Protection
Safety glasses with side shields (or goggles)	Full-face air-purifying respirator (to be worn)
Hard Hat	Hard Hat
Steel-toe, steel-shank work shoes or boots (chemical resistant)	Steel-toe, steel-shank work shoes or boots (chemical resistant)
Face shield (optional)	Poly-coated disposable coveralls
Poly-coated disposable or standard disposable coveralls (optional)	Inner gloves of snug-fitting latex or nitrile (optional)
Inner gloves of snug-fitting latex or nitrile (optional)	Outer boots of neoprene or butyl rubber of disposal outer "booties" (optional)
Outer gloves of neoprene or nitrile (optional)	Taping of gloves and boots to disposable coveralls (optional)
Outer boots of neoprene or butyl rubber or disposable outer "booties" (optional)	

Notes:

1. The use of optional equipment is primarily dependent upon site conditions.

2 Respirator to be fitted with NIOSH-approved high-efficiency filter (HEPA) combination respirator cartridges approved for organic vapors, particulates, gases, and fumes.

TABLE C8-2
PLANNED LEVELS OF PERSONAL PROTECTION FOR EACH ACTIVITY
DINABURG DISTRIBUTING SITE

Field Activity	Level of Protection*
A. Non-Intrusive Activities	
1. Site Reconnaissance/Surveys	D
2. Land Surveying	D
3. Support Zone Activities	D
B. Intrusive Activities	
1. Drilling/Monitoring Well Installation	D+/C
2. Environmental Sampling	D
3. Equipment Decontamination	D

Notes:

* These are the levels of protection at which work will commence during the various activities on the site. Due to onsite conditions, and as directed by the Site HSO, it may become necessary to upgrade, or it may be possible to downgrade, the level of personal protection.

Level D+ includes the requirements specified in Table 8-1 for Level C with the exception of the full-face air-purifying respirator.

C9.0 AIR MONITORING

Air monitoring will be performed during all intrusive activities by trained URSGWC personnel. While sampling activities are in progress, monitoring frequencies will be as summarized in Table C9-1. Air monitoring equipment will be calibrated daily and all data will be recorded in the field notebook and transferred to Instrument Reading Logs (Appendix B). Each day, intrusive work will not begin until the instruments are calibrated and background levels are taken and recorded. Air will be monitored for total volatiles with a photoionization detector (PID) (HNu Model PI 101, or equivalent). Explosive atmosphere, oxygen content, and hydrogen sulfide will be monitored with an explosimeter (Bacharach Sentinel 44, or equivalent) only when PID readings above background are detected. All air monitoring results and meteorological data (e.g., temperature range, wind speed, wind direction, etc.) will be recorded in the field notebook and will be transferred to Instrument Reading Logs.

C9.1 Total Volatiles

Air monitoring for total volatiles (organic vapors) will be performed using a PID (HNu Model PI 101, or equivalent) equipped with the standard probe which contains a 10.2 eV lamp. When readings less than 1 part per million (ppm) above background in the breathing zone are observed consistently, monitoring will take place at least every 10 minutes or for every sample retrieved. When readings between 1 ppm and 5 ppm above background in the breathing zone are observed consistently, monitoring will be continuous and Level C protection will be utilized. If organic vapor readings exceed 5 ppm above background in the breathing zone, or other instrument readings necessitate work suspension, intrusive activities will be halted and the level of protection used by onsite personnel will be reassessed. Monitoring frequencies during sampling will be as summarized in Table C9-1.

TABLE C9-1
ACTION LEVELS DURING INTRUSIVE ACTIVITIES
DINABURG DISTRIBUTING SITE

Organic Vapors (PID)	Combustibles	Oxygen	Hydrogen Sulfide	Responses
0 to 1 to ppm Above Background Sustained Reading	0 to 10% LEL	19.5 to 23.5%	0-5 ppm	• Continue intrusive activities. • Level D protection. • Continue monitoring every 10 minutes/ every sample retrieved in work area.
1 to 5 ppm Above Background Sustained Reading	0 to 10% LEL	19.5 to 23.5%	5-10 ppm	• Continue intrusive activities. • Level D protection. • Continue monitoring for organic vapors in the work area and at the Exclusion Zone perimeter. • Continuous monitoring for LEL, oxygen, and hydrogen sulfide in the work area.
>5 ppm Above Background, Sustained Reading	>10% LEL	<19.5% or >23.5%	>10 ppm	• Temporarily suspend intrusive activities. • Withdraw from area; shut off all engine ignition sources. • Continuous monitoring for organic vapors at Exclusion Zone perimeter if organic vapor readings >5 ppm. • Continuous LEL monitoring in breathing zone if LEL reading >10% in boring or test trench. • Consult with Project HSO.

Notes:

Air monitoring for action levels will occur in the breathing zone.

If action levels for any one of the monitoring parameters is exceeded, the appropriate responses listed in the right hand column should be taken.

C9.2 Explosive Atmosphere/Oxygen Content/Hydrogen Sulfide Gas

A Bacharach Sentinel 44, or equivalent, will be used to monitor for explosive atmosphere, percent oxygen, and hydrogen sulfide content only when PID readings above background are detected. Readings greater than 10 percent of the lower explosive limit (LEL), less than 19.5 percent oxygen, greater than 23.5 percent oxygen, or greater than 10 ppm hydrogen sulfide will require temporary suspension of intrusive activities until the Project SHO determines a safe re-entry level.

C9.3 Work Stoppage Responses

The following responses will be initiated whenever one or more of the action levels necessitating a work stoppage is exceeded:

A. The Site HSO will be consulted immediately.

B. All personnel (except as necessary for continued monitoring and contaminant mitigation, if applicable) will be cleared from the work area (e.g., from within the Exclusion Zone).

Any chemical release to air, water, or soil must be reported to the Site HSO at once. Any exposure resulting from protective equipment failure must be reported immediately to the Site HSO and to the Project HSO in writing within 24 hours.

C9.4 Calibration of Air Monitoring Instruments

A. Photoionization Detector: The photoionization detector will be calibrated to a benzene surrogate daily (prior to field activities) and the results will be recorded in the field notebook and transferred to Instrument Reading Logs.

B. Explosimeter: Once a day, the explosimeter will be calibrated to a methane gas and hydrogen sulfide gas standard. Prior to each use, the oxygen sensor will be air-calibrated at an

upwind location. This calibration involves adjusting the meter to read 20.9 percent, the concentration of oxygen in ambient air.

9.5 Community Air Monitoring Plan

Real-time air monitoring for volatile organic compounds will be conducted at the downwind perimeter of the Exclusion Zone on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities will be halted and monitoring continued under the provisions of a Vapor Emission Response Plan (Section C9.5.1). All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review if requested.

9.5.1 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the Exclusion Zone, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background, but less than 25 ppm over background at the perimeter of the Exclusion Zone, activities can resume provided the organic vapor level 200 feet downwind of the Exclusion Zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the perimeter of the Exclusion Zone, activities must be shut down. When work shutdown occurs, downwind air monitoring as directed by the Site HSO will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission Response Plan (Section C9.5.2).

C9.5.2 Major Vapor Emission Response Plan

If any organic vapor levels greater than 5 ppm over background are identified 200 feet downwind from the Exclusion Zone or half the distance to the nearest residential or commercial property, whichever is less, all work activities will be halted.

If, following the cessation of work activities, or as the result of an emergency, organic vapor levels persist above 5 ppm above background 200 feet downwind from the Exclusion Zone or half the distance to the nearest residential or commercial property, then the air quality will be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 foot zone).

If efforts to abate the emission source are unsuccessful and organic vapor levels approaching 5 ppm persist for more than 30 minutes in the 20-foot zone, then the Major Vapor Emission Response Plan automatically shall be placed into effect. Also, the Major Vapor Emission Response Plan shall be immediately placed into effect if 20-foot zone organic vapor levels are greater than 10 ppm above background.

Upon activation of the Major Vapor Emission Response Plan, the following activities will be undertaken:

- All Emergency Response authorities will be contacted immediately by the Site HSO and advised of the situation.

- Air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Site HSO.

C10.0 SAMPLE HANDLING

The collection and analysis of environmental samples will require caution, not only to ensure the safety of site sampling and support personnel, but also to ensure accuracy of results. To minimize hazards to laboratory personnel, sample volumes will be no larger than necessary, and the outside of all sample containers will be wiped clean prior to shipment.

To preserve sample integrity and to prevent contaminant escape, packaging of samples will follow the sampling protocols outlined in the *Field Sampling Plan* (FSP). All samples will be placed in a sealed shipping container prior to shipment.

Provisions for chain-of-custody documentation are also described in the FSP (Section A).

C11.0 DECONTAMINATION PROCEDURES

C11.1 Decontamination of Personnel

Protective clothing, boots, and gloves will be decontaminated before entering the Support Zone by a thorough soap-and-water wash prior to leaving the Exclusion Zone. Personnel performing intrusive tasks in potentially contaminated areas (drilling and environmental sampling) will be advised that all clothing worn under protective clothing (i.e., underwear, shirts, socks, trousers) should be laundered separately from street clothing before re-wearing. If protective clothing is breached and personal clothing becomes contaminated, the personal clothing will be disposed of.

C11.2 Decontamination of Equipment

Decontamination of sampling equipment is described in the FSP. Other light equipment (such as tools, containers, monitoring instruments, radios, clipboards, etc.) will be segregated and deposited on plastic drop cloths or in plastic-lined containers placed in the Contamination Reduction Zone, and will be wiped off with damp cloths.

Decontamination of drilling equipment, such as auger flights, and heavy equipment and vehicles will be carried out by high-pressure water in the Contamination Reduction Zone.

C12.0 EMERGENCY PROCEDURES

The most likely incidents for which emergency measures may be required are:

- An exposure-related worker illness
- A sudden release of hazardous gases/vapors during drilling or excavation
- An explosion or fire occurring during drilling or excavation
- A heavy equipment-related accident, or other accident resulting in personal injury
- Slipping, tripping, or falling resulting in personal injury
- Spill of contaminated liquid or solid

Emergency procedures established to respond to these incidents are covered under the sections that follow.

C12.1 Communications

Communications will be centered in the field vehicles, which will contain telephones for direct outside communications with emergency response organizations. The vehicles also will contain two-way radios for contact with personnel working on site. If the Onsite Coordinator or designee leaves a field vehicle, a radio will be carried by him at all times. A radio will be maintained at the drill rig and with any groups of personnel who are performing tasks on site (e.g., environmental sampling).

C12.2 Escape Routes

Flags will be positioned near drill rigs to indicate wind direction. In the event of a sudden release of hazardous gases or a fire, all personnel will be required to move upwind or at 90 degrees away from the location of the release or fire, toward the site exit point. This may require personnel to move from the Exclusion Zone directly into an offsite area without proper decontamination. At the conclusion of the emergency, they should perform proper decontamination.

C12.3 Evacuation Signal

In the event of a sudden release or fire requiring immediate evacuation of the site, three quick blasts will be sounded on an air horn. Sounding the air horn will be the responsibility of the drill rig operator, backhoe operator, or the supervising geologist. The horns will be kept in a conspicuous place for quick access by personnel. An air horn will be kept in the Contamination Reduction Zone as well. The NYSDEC and the Project HSO will be notified by telephone, and later by written report, whenever a site evacuation is executed.

C12.4 Other Signals

Emergency hand signals for use by personnel wearing air-purifying respirators are summarized in Table C12-1.

C12.5 Fire

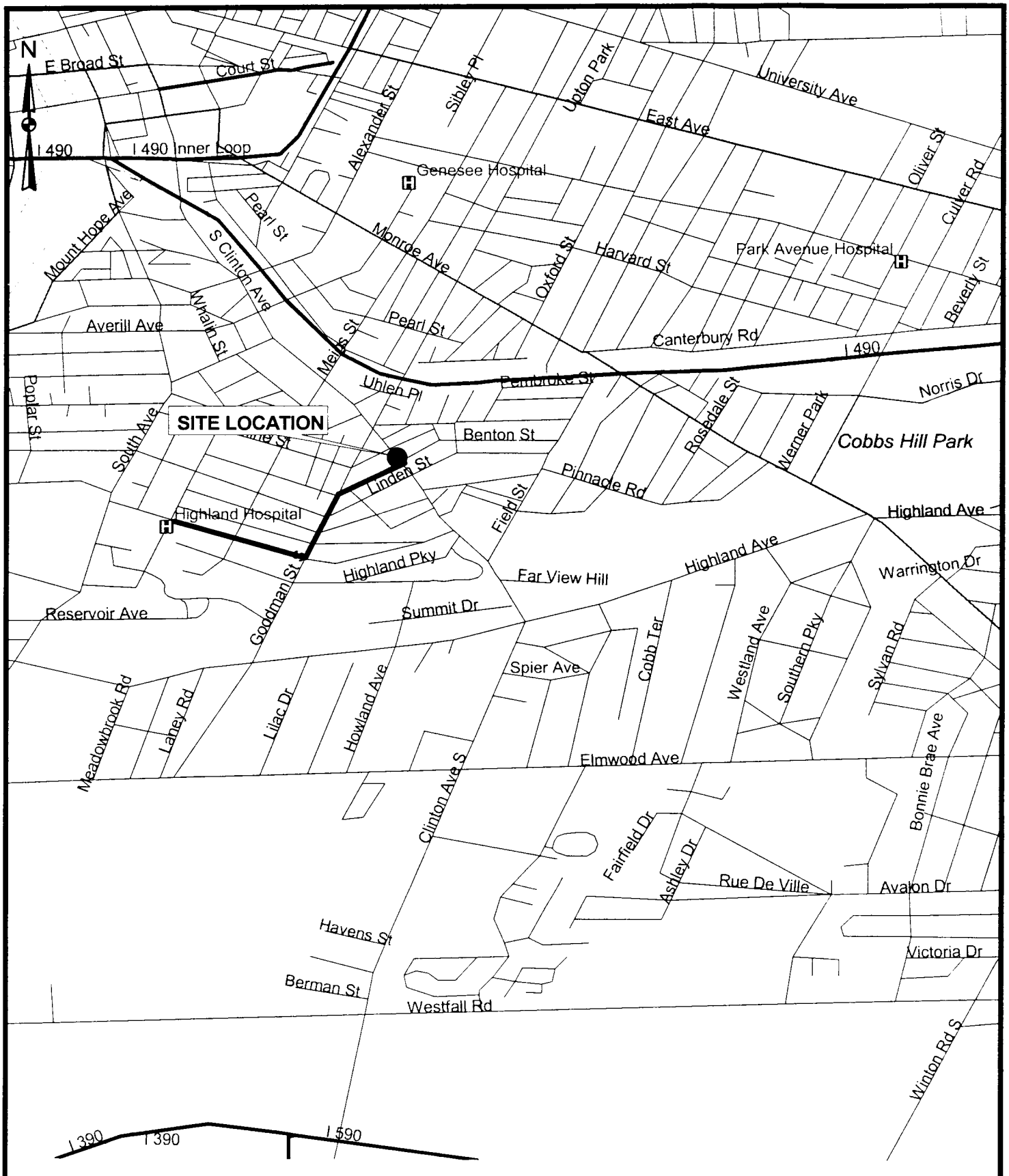
In the event of a fire that cannot be controlled with available equipment, Onsite Coordinator or designee will summon the local fire department immediately and apprise them of the situation upon their arrival. The NYSDEC also will be notified, (see Table C12-2 for telephone numbers of emergency response agencies).

C12.6 First Aid

At the startup of field activities, the Project HSO will contact hospital personnel regarding the potential hazards at the site. First aid for personal injuries will be administered, if possible, at the shed by the Onsite Coordinator or designee. If a site worker should require further treatment, the individual will be transported to the hospital in the URSGWC vehicle located on site or an ambulance will be summoned. The onsite vehicle will carry written directions to the hospital as well as a copy of Figure C12-1 showing the route.

TABLE C12-1
EMERGENCY HAND SIGNALS
FORMER DINABURG DISTRIBUTING SITE

• Hand gripping throat	Can't breathe.
• Grip partner's wrist, or	Leave area immediately, no debate! place both hands around wrist.
• Hands on top of head	- Need assistance.
• Thumbs up	- I am all right, OK, I understand.
• Thumbs down	- No, negative.



Directions to Hospital: Southwest on Benton St. to Goodman St. Turn left (south) on Goodman St. Turn right (west) onto Rockingham St. Hospital is at the corner of Rockingham St. and Mount Vernon Ave.

URS Greiner Woodward Clyde	FORMER DINABURG DISTRIBUTING SITE LOCATION MAP	FIGURE C12-1

J:\35798.01\dh\gis\sitelocation.apr SITELOCATION 7/26/2000

TABLE C12-2

EMERGENCY TELEPHONE NUMBERS

FORMER DINABURG DISTRIBUTING SITES

Emergency Response Agencies	
City of Rochester Fire Department	911
City of Rochester Police Department	911
Monroe County Sheriff Department	911
Medical Facilities	
Highland Hospital	(716) 473-2200
1000 South Avenue	(Emergency) (716) 341-6880
Rochester, New York 14620	
Environmental and Health Agencies	
USEPA National Response Center (chemical spills, oil spills, pollutant discharges)	1-800-424-8802
New York State Department of Environmental Conservation (Todd Caffoe, PE)	(716) 226-2466
New York State Department of Health - Toxics Coordinator (Dave Napier)	(716) 423-8071
URSGWC	
Daniel Rothman, PE	(716) 856-5636
Richard Fudeman	(716) 856-5636

All accidents, however insignificant, will be reported to the Site HSO, who will report the accident to the Project HSO. All personnel designated to administer first aid will have received a minimum of eight hours training in first aid and CPR, and been certified by the American Red Cross.

In the event of a serious personal injury requiring offsite medical attention, the injured person will first be moved to the Contamination Reduction Zone, where an attempt will be made to go through the decontamination procedures, including removal of protective clothing. If the injury is life threatening, decontamination will be of secondary importance and the injured party will be taken directly to the hospital. If a head, neck, back, or spinal injury is suspected, the injured person will not be moved and an ambulance will be summoned to the site.

C12.7 Emergency Assistance

The name, telephone number, and location of police, fire, hospital, and other agencies whose services may be required, or from whom information may be needed, will be kept in the field vehicle. The list is presented in Table C12-2.

If an ambulance should have to be called to the site, the injured person should meet the ambulance outside the Exclusion Zone if possible. If a head or spinal injury is suspected or the person is unconscious for any reason, medical personnel may have to come into the Exclusion Zone.

C12.8 Spills

The potential for spills to occur during onsite work at the site is minimal, since the direct handling of hazardous waste containers (drums, tanks, etc.) is not expected to be part of the scope of work. In the event that residual materials are spilled on site, the following procedures will be implemented.

C12.8.1 Liquid Spills

If a liquid (decontamination water, well development water, etc.) is spilled on a permeable surface, 2 inches of surficial soil will be removed where the spill occurred and drummed. The area

later will be either backfilled with clean soil or regraded. If liquid is spilled on an impermeable surface, a sorbent material will be applied to the spill area. The sorbent material will be swept up and drummed, and the spill area washed down with clean water.

C12.8.2 Soil Spills

Contaminated soil spilled on a permeable surface will be shoveled into a drum, and the top 2 inches of soil where the spill occurred also will be removed and drummed. The area then will be either backfilled with clean topsoil or regraded. If soil is spilled on an impermeable surface, the material will be shoveled (or swept) back into a drum, and the area washed with clean water.

All spills will be reported to the Project HSO within 24 hours. The Project HSO in turn will inform the NYSDEC of the incident.

C12.9 Reports

Any emergencies, spills, or releases that occur on the site will be reported to the Project HSO and NYSDEC within one hour and will be followed by written notification within 24 hours.

C12.10 Accident Investigation and Reporting

C12.10.1 Accident Investigations

All accidents requiring first aid which occur incidental to activities on site will be investigated. Standard OSHA formats will be used for reporting any accidents/injuries/illness that occur on the site. The investigation format will be as follows:

- Interviews with witnesses
- Photographs, if applicable
- Necessary actions to alleviate the problem

C12.10.2 Accident Reports

In the event that an accident or some other incident such as an explosion or exposure to toxic chemicals occurs during the course of the project, the Project HSO and NYSDEC will be telephoned within one hour and receive a written notification within 24 hours. The report shall include the following items:

- Name, telephone number, and location of the contractor, if not URSGWC personnel
- Name and title of person(s) reporting
- Date and time of accident/incident
- Location of accident/incident, (i.e., building number, facility name)
- Brief summary of accident/incident giving pertinent details including type of operation ongoing at the time of the accident/incident
- Cause of accident/incident
- Casualties (fatalities, disabling injuries)
- Details of any existing chemical hazard or contamination
- Estimated property damage, if applicable
- Nature of damage; effect on contract schedule
- Action taken by contractor/URSGWC to ensure safety and security
- Other damage or injuries sustained (public or private)

C13.0 SAFETY CONCERNS AND CONTINGENCY MEASURES DURING DRILLING OPERATIONS

Drilling at this site will be conducted under the OSHA Safety and Health Standards (29 CFR 1926/1910) relative to heavy equipment operation. The following sections describe site-specific safety measures to be implemented during various phases of drilling activities.

General precautionary measures that should be taken to prevent accidents and injuries during drilling activities are:

- The driller or the driller's helper are the only people who should operate the drill rig
- Keep hands away from moving parts
- Do not wear loosely-fitting clothing when working near the drill rig to avoid entanglement in cables, ropes, etc.
- Personnel working near the drill rig should look upward from time to time and generally be aware of what is overhead
- Personnel should not stand directly behind the drill rig to avoid falling or projected objects

An active drilling Exclusion Zone is established by the opening of a borehole. A PID calibrated to a benzene surrogate, an explosimeter calibrated to methane, and a particulate meter will be used in this zone. As described in Table C9-1, readings will be made at the borehole at timed intervals or every time a sample is retrieved from the borehole. Monitoring with real-time instrumentation will be performed at the borehole and around the drill rig. Action levels will be considered to have been reached when a continuous, steady reading at or above an action level has been observed.

If at any time during the drilling program, buried drums, cylinders, metal, or concrete are encountered, drilling activities will cease immediately. After obtaining instrument readings, the project geologist and the Site HSO will decide whether to continue or discontinue drilling.

APPENDICES

APPENDIX A

WASTE SITE WORKER TRAINING PROGRAMS

TABLE A-1

WASTE SITE WORKER TRAINING PROGRAM (40 HOURS)

Introduction to Program
Sources of Reference
Hazardous Waste Operations and Emergency Response (29 CFR 1910.120)
Heat Stress/Cold Exposure
Chemical & Physical Hazards
Chemical Protective Clothing (CPC)

Toxicology
Respiratory Protection Principles
Air-Purifying Respirators (APR)
APR Inspection, Donning, and Doffing
Self Contained Breathing Apparatus (SCBA)
SCBA Checkout
SCBA Field Exercise
Review of SCBA Lab and Field Exercise
Air-Line Respirators (ALR)

Site Safety
Site Control
Decontamination
Air Monitoring Equipment
Permit Required Confined Spaces (29 CFR 1910.146)
Entry Permit Development
Confined Space Entry
Review of Confined Space Lab and Field Exercise
Material Handling and Spill Containment

Health and Safety Plans (HASP)
Emergency Response Plans (ERP)
HASP & ERP Development

Level A/B Field Exercise
Level B/C Field Exercise
Air Monitoring Equipment Lab
SCBA Proficiency Checkout

Review of Lab & Field Exercises
Review of Air Monitoring Equipment Lab
Medical Monitoring
Hazard Communication (29 CFR 1910.120)
Risk Assessment
APR Fit Test Demonstration and Certification
Written Test

TABLE A-2

WASTE SITE WORKER SUPERVISORY TRAINING PROGRAM (8 HOURS)

Record keeping Requirements Under Standard 29 CFR 1910.120
OSHA Inspections
Establishing Community Relations
Employee Training and Motivation
Management Traits
Dermal Protection Program
Respiratory Protection Program
Preventative Heat Stress and Cold Exposure Management
Medical Monitoring Requirements
Reporting and Recording Occupational Injuries, Illnesses, and Exposures
Accident Prevention
Spill Containment Program
Permit Required Confined Spaces (29 CFR 1910.146)
Determining the Effectiveness of Decontamination Procedures
Implementation of Site Health and Safety Plans
Implementation of Emergency Response Plans
Implementation of the Hazard Communication Standard (29 CFR 1910.120)
Responsibilities of the Site Safety and Health Supervisor and Project Manager
Personnel Sampling
Interpretation of Air Monitoring Data

TABLE A-3

WASTE SITE WORKER ANNUAL REFRESHER TRAINING PROGRAM (8 HOURS)

OSHA Requirements
Hazardous Wastes
Toxicology
Exposure Limits
Chemical Hazards
Temperature Stress
Other Physical Hazards
Radiation
Site Control at Hazardous Waste Sites
Decontamination Procedures
Personal Protective Equipment
Confined Spaces
Air Monitoring Equipment
Field Exercises

APPENDIX B

FIELD ACTIVITY FORMS

DAILY SAFETY MEETING

URS
CONSULTANTS, INC.

DATE: _____ CUSTOMER: _____

SPECIFIC: _____

_____

SAFETY TOPICS PRESENTED:

PROTECTIVE CLOTHING/EQUIPMENT: _____

_____

CHEMICAL HAZARDS: _____

_____

PHYSICAL HAZARDS: _____

_____

EMERGENCY PROCEDURES: _____

_____

HOSPITAL/CLINIC: _____ PHONE: _____

PARAMEDIC PHONE: _____

HOSPITAL ADDRESS: _____

SPECIAL EQUIPMENT: _____

_____

OTHER: _____

_____

ATTENDEES:

NAME PRINTED: _____ SIGNATURE: _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

MEETING CONDUCTED BY:

_____ _____

Name Printed *Signature*

ONSITE SAFETY BRIEFING

URS
CONSULTANTS, INC.
282 Delaware Avenue
Buffalo, New York 14202

DATE: _____ PROJECT: _____

MEETING CONDUCTED BY: _____

NAME: _____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

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_____ _____

REPORT OF ACCIDENT / INJURY

URS
CONSULTANTS, INC.

PROJECT: _____ DATE OF OCCURRENCE: _____

LOCATION: (be specific) _____

_____

TYPE OF OCCURRENCE: (check all that apply)

- ☐ DISABLING INJURY
- ☐ OTHER INJURY
- ☐ PROPERTY DAMAGE
- ☐ EQUIPMENT FAILURE
- ☐ CHEMICAL EXPOSURE
- ☐ FIRE
- ☐ EXPLOSION
- ☐ VEHICLE ACCIDENT
- ☐ OTHER (explain) _____

_____

WITNESSES TO ACCIDENT / INJURY: (and office)

_____ _____

_____ _____

_____ _____

_____ _____

INJURIES:

NAME OF INJURED: _____ OFFICE: _____

WHAT WAS BEING DONE AT THE TIME OF THE ACCIDENT/INJURY? _____

_____

_____

_____

_____

_____

_____

_____

NATURE OF THE ACCIDENT/INJURY: _____

WHAT CAUSED THE ACCIDENT/INJURY? _____

WHAT CORRECTIVE ACTION WILL BE TAKEN TO PREVENT RECURRENCE? _____

SIGNATURES:

HEALTH & SAFETY OFFICER: _____ DATE: _____

PROJECT MANAGER: _____ DATE: _____

REVIEWER: _____ DATE: _____

COMMENTS BY REVIEWER: _____

INSTRUMENT READING LOG

URS
CONSULTANTS, INC.

PROJECT: _____ JOB NO.: _____

OPERATOR: _____ DATE: _____

INSTRUMENT: _____ CALIBRATION: _____
Amt. Component. Date

SAMPLING TECHNIQUE: _____

_____

SAMPLING INTERVAL: _____

BACKGROUND READING: _____

ACTION LEVEL RESPONSE: _____

TIME	LOCATION	READING (UNITS)	DETECTION LIMIT (SCALE)

APPENDIX C

STANDARD OPERATING SAFETY PROCEDURES

APPENDIX C - STANDARD OPERATING SAFETY PROCEDURES

Rules for onsite personal safety are shown in Table C-1; rules for operational safety appear in Table C-2.

TABLE C-1

PERSONAL SAFETY RULES

- Visual contact must be maintained between crew members on site.

- Any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in any area designated as contaminated. These practices include as a minimum, eating, drinking, chewing gum or tobacco, and smoking.

- Hands and face must be thoroughly washed upon leaving the work area, and before engaging in any other activities, especially eating or drinking.

- Due to interference of facial hair with the mask-to-face seal on air-purifying respirators, personnel working on site will not be permitted to wear facial hair that interferes with the seal.

- Contact with contaminated surfaces or surfaces suspected of contamination should be avoided. Site personnel should avoid walking through puddles, mud, or other discolored areas, and should not kneel or sit on the ground.

- Field personnel shall be familiar with the physical characteristics of the site, including:

    - wind direction in relation to the working area
    - accessibility to associates, equipment, and vehicles
    - communications
    - work zones
    - site access

- Medicine and alcohol can exacerbate the effect from exposure to toxic chemicals. Prescribed drugs should not be taken by field personnel where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverage and controlled substance intake is strictly forbidden during onsite operations.

TABLE C-2

OPERATIONAL SAFETY RULES

- No visitors shall be allowed into any Exclusion Zone without the permission of the New York State Department of Environmental Conservation.

- Onsite personnel must use the buddy system when wearing respiratory protective equipment. A third person, suitably equipped, is required as a safety backup during initial site entries.

- During day-to-day operations, onsite workers will act as a safety backup to each other. Offsite personnel will provide emergency assistance.

- Wind indicators will be set up so as to be visible from the Exclusion Zone.

- Daily briefings will be held to review site hazards, changes in level of personal protection required, special safety precautions for assigned work activities, and emergency response.

- All personnel going on site must be thoroughly briefed on anticipated hazards, and trained on equipment to be worn, safety procedures, emergency procedures, and communications

TABLE C6-1
HAZARD CHARACTERISTICS OF POTENTIALLY PRESENT CONTAMINANTS OF CONCERN
FORMER DINABURG DISTRIBUTING SITE

SUBSTANCE	TOXICITY/CARCINOGENICITY	OCCUPATIONAL EXPOSURE VALUES*
Benzene	Confirmed human carcinogen. Toxic by ingestion, inhalation, and skin adsorption. Irritant to eyes, nose, and throat.	0.5 ppm (Skin) (1)(TLV-TWA) 2.5 ppm (STEL)(2)(TLV) 1 ppm (PEL) 5 ppm (STEL)(2)(PEL)
1,2-Dichloroethylene	Moderately toxic by ingestion, inhalation, and skin contact. Irritant and narcotic in high concentrations.	200 ppm (TLV-TWA and PEL)
Ethylbenzene	Moderately toxic by ingestion and skin adsorption. Irritant to skin and eyes. Confirmed animal carcinogen.	100 ppm (TLV-TWA and PEL) 125 ppm (STEL) (2) (TLV)
Polychlorinated Biphenyls (PCBs)	Highly toxic. Suspected human carcinogen.	0.5 mg/m^3(Skin) (1) (TVL-TWA and PEL) (1254) 1 mg/m^3 (Skin) (1) (TLV-TWA and PEL) (1242)
Tetrachloroethylene (Perchloroethylene)	Moderately toxic. Irritating to skin and eyes. Confirmed animal carcinogen.	
Toluene	Moderate toxicity via the oral, inhalation, and intraperitoneal routes, low toxicity via the dermal route.	50 ppm (Skin) (1) (TLV-TWA) 200 ppm (PEL) 300 ppm (Ceiling) (3) (PEL)
Vinyl Chloride	Highly irritating via inhalation, skin, eyes and mucous membranes. Acts as a anesthetic in high concentrations. Causes circulatory and bone changes in fingertips of workers. A human brain carcinogen.	13 mg/m3 (Skin) (TLV-TWA) 1 ppm (PEL) 5 ppm (STEL) (2) (PEL) Lowest Feasible Conc. (PEL)
1,1,1-Trichloroethane	Irritating to eyes and tissue.	350 ppm (TLV-TWA and PEL) 450 ppm (STEL) (2) (TLV)
Trichloroethylene	Toxic by inhalation.	50 ppm (TLV-TWA) 100 ppm (STEL) (2) (TLV) 100 ppm (PEL) 200 ppm (Ceiling (3) (PEL)

TABLE C6-1 (Continued)

Notes

* PELs are 8-hour Time-Weighted Averages (TWAs) unless otherwise noted.

(1) "Skin" Notation ? Listed substances followed by the designation ?Skin? refer to the potential significant contribution to the overall exposure by the cutaneous route, including mucous membranes and the eyes, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. Vehicles present in solutions or mixtures also can enhance potential skin absorption significantly. It should be noted that while some materials are capable of causing irritation, dermatitis, and sensitization in workers, these properties are not considered relevant when assigning a skin notation. It should be noted, however, that the development of a dermatological condition can significantly affect the potential for dermal absorption.

(2) STEL - Short Term Exposure Limit ? 15-minute TWA exposure which should not be exceeded at any time during a work day.

(3) Ceiling - The concentration that should not exceeded during any part of the working exposure.

Definitions

Threshold Limit Values (TLVs) - Refers to airborne concentrations of substances as issued by the American Conference of Governmental Industrial Hygienists (ACGIH) and represents conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Threshold Limit Value - Time-Weighted Average (TLV-TWA) - The Time-Weighted Average concentration as issued by ACGIH for a normal 8-hour work day and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Threshold Limit Value - Short-Term Exposure Limit (TLV-STEL) - The maximum concentration as issued by ACGIH to which workers can be exposed continuously for a short period of time (up to 15 minutes) without suffering from 1) irritation, 2) chronic or irreversible tissue damage, or 3) narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially reduce work efficiency.

Permissible Exposure Limits (PELs) - Exposure limits that are enforceable by the Occupational Safety and Health Administration (OSHA) as legal standards and cannot be exceeded over an 8-hour exposure.

ppm - parts per million

mg/m^3 - milligrams per cubic meter

TABLE C6-1 (Continued)

References

American Conference of Governmental Industrial Hygienists. *1999 Guide to Occupational Exposure Values*. Cincinnati, Ohio.

29 CFR, Part 1910.1000, Tables Z-1 and Z-2, Limits for Air Contaminants, July 1, 1995.

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