

US EPA ARCHIVE DOCUMENT

## **SECTION 7**

# **ENVIRONMENTAL MONITORING**



## ENVIRONMENTAL MONITORING

### Introduction

The Clinton Landfill No. 3 Chemical Waste Unit has been designed with 4 different environmental monitoring systems: (1) groundwater monitoring, (2) leachate monitoring, (3) surface monitoring, and (4) ambient air monitoring. These environmental monitoring systems will provide a performance based approach to demonstrate the effectiveness of the landfill design. Additionally, in the unlikely event that there is a contaminant release to the environment, the environmental monitoring systems will provide an early warning system, prior to contamination leaving the facility.

### Groundwater Monitoring

#### *Groundwater Monitoring Overview*

This section presents a summary of the IEPA permitted groundwater monitoring plan for the Clinton Landfill No. 3 and the proposed groundwater monitoring network for the Chemical Waste Unit.

The IEPA permitted final groundwater monitoring network for Clinton Landfill No. 3 has been designed to monitor groundwater quality within the uppermost water bearing zones beneath the facility as they were identified in the hydrogeologic investigation. Nested wells will exist within the Upper Radnor Till Sand Zone, the Lower Radnor Till Sand Zone, Organic Soil, and the Roxana Silt-Robein Member at locations around the waste boundary where these units are present. Figure 7-1 illustrates the well nest locations for the permitted monitoring well network. Table 7-1 lists the permitted monitoring wells.

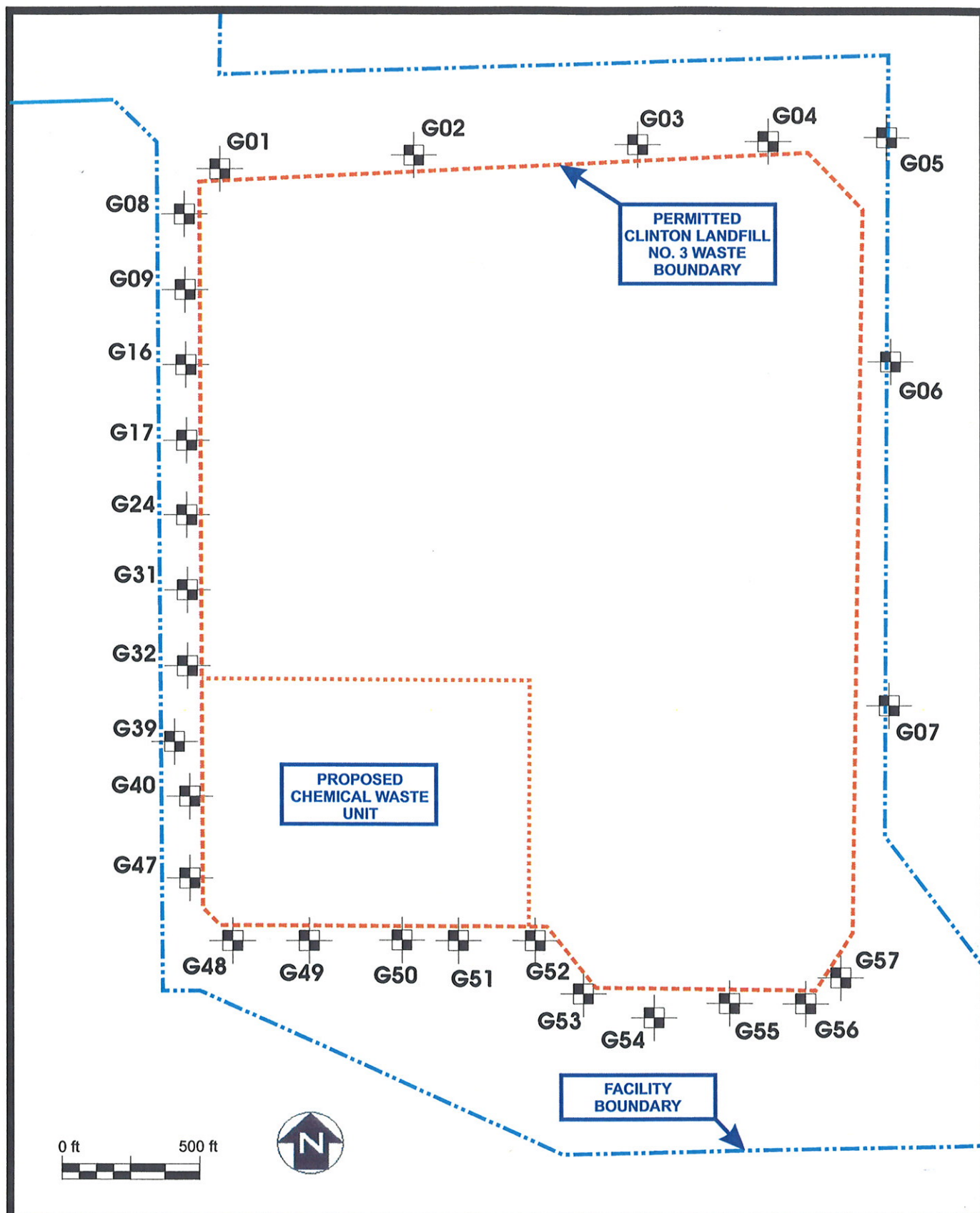
The monitoring network for the proposed Chemical Waste Unit will utilize 9 of the permitted monitoring well locations. Each of the 9 locations which will be screened in the uppermost water bearing zone (3 upgradient, and 6 downgradient) will be monitored in accordance with the Plan. Figure 7-2 illustrates the locations of the proposed monitoring wells for the Chemical Waste Unit. With the exception of the changes outlined within this report, groundwater monitoring for the proposed Clinton Landfill No. 3 Chemical Waste Unit will be conducted in accordance with the IEPA permitted Clinton Landfill No. 3 Groundwater Monitoring Plan (refer to Appendix M) and the approved permit (refer to Appendix A).

#### *Groundwater Monitoring Constituents and Frequency*

In addition to the quarterly sampling requirements for the Clinton Landfill No. 3 monitoring well network, the six downgradient wells (G40, G47, G48, G49, G50 and G51) to be utilized for the Chemical Waste Unit monitoring network will be monitored on a quarterly basis for the following parameters:

1. Groundwater Elevation
2. pH,
3. Polychlorinated Biphenyls (PCBs), and
4. Specific Conductance.





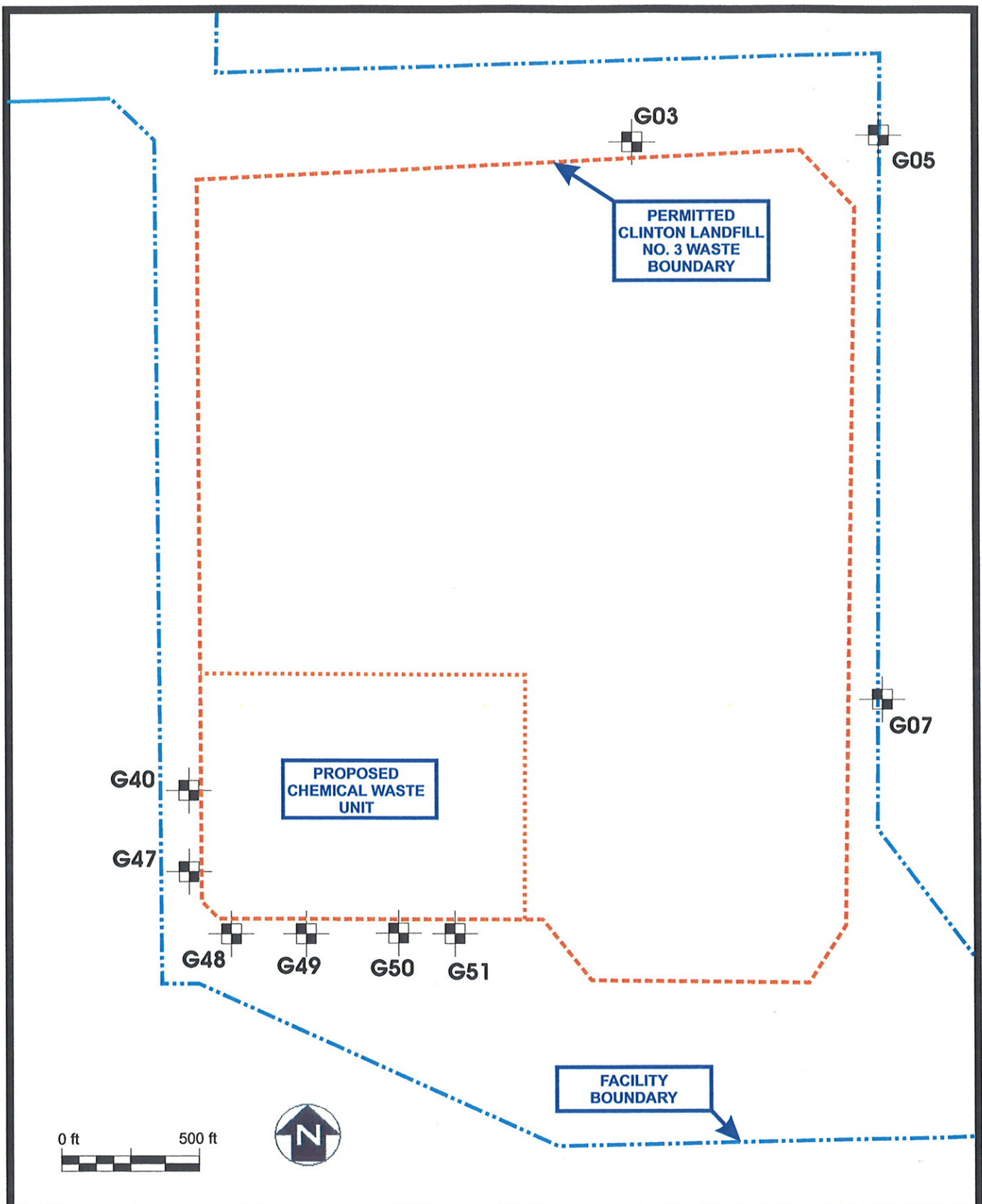


TABLE 7-1 PERMITTED MSW UNIT MONITORING WELL SUMMARY TABLE				
Monitoring Well	Designation	Well Screen		Notes
		Geologic Unit	Elevation (ft-MSL)	
G01M*	Upgradient	LR	644.3 - 643.2	Existing well EX-12S
G01D*	Sidegradient	OS	637.4 - 633.7	Existing well EX-12D
G02D*	Upgradient	OS	634.8 - 631.0	Existing well EX-13
G03D*	Upgradient	OS	643.7 - 641.2	Existing well EX-14
G04M	Upgradient	LR	638.3 - 635.5	To be installed if unit encountered
G05M*	Upgradient	LR	642.3 - 638.8	Existing well EX-15
G06D*	Upgradient	OS	637.4 - 632.3	Existing well EX-24
G07S*	Upgradient	UR	651.4 - 649.8	Existing well EX-23S
G07D*	Upgradient	OS	632.8 - 622.8	Existing well EX-23D
G08M	Downgradient	LR	644.0 - 643.0	To be installed if unit encountered
G08D	Downgradient	OS	637.0 - 633.0	
G09M	Downgradient	LR	644.0 - 643.0	To be installed if unit encountered
G09D	Downgradient	OS	633.0 - 632.0	
G16M	Downgradient	LR	644.0 - 643.0	To be installed if unit encountered
G16D	Downgradient	OS	637.0 - 633.0	
G17M	Downgradient	LR	643.0 - 641.0	To be installed if unit encountered
G17D	Downgradient	OS	636.0 - 632.0	
G24M	Downgradient	LR	645.0 - 638.0	To be installed if unit encountered
G24D	Downgradient	OS	636.0 - 632.0	
G31M	Downgradient	LR	642.0 - 639.0	To be installed if unit encountered
G31D	Downgradient	OS	632.0 - 622.0	
G32M	Downgradient	LR	641.0 - 638.0	To be installed if unit encountered
G32D	Downgradient	OS	636.0 - 630.0	
G39M#	Downgradient	LR	641.0 - 637.0	To be installed if unit encountered
G39D#	Downgradient	OS	636.0 - 630.0	
G40M	Downgradient	LR	640.9 - 637.4	Existing well EX-19
G40D	Downgradient	OS	636.0 - 630.0	
G47M	Downgradient	LR	641.0 - 636.0	To be installed if unit encountered
G47D	Downgradient	OS	635.0 - 630.0	
G47R	Downgradient	RR	667.0 - 663.0	
G48M	Downgradient	LR	641.0 - 636.0	To be installed if unit encountered
G48D	Downgradient	OS	635.0 - 630.0	
G48R	Downgradient	RR	668.0 - 663.0	
G49M	Downgradient	LR	640.0 - 636.0	To be installed if unit encountered
G49D	Downgradient	OS	634.0 - 632.0	
G49R	Downgradient	RR	668.0 - 663.0	
G50D*	Downgradient	OS	634.0 - 632.0	Existing well EX-20
G51M	Downgradient	LR	640.0 - 636.0	To be installed if unit encountered
G51D	Downgradient	OS	634.0 - 632.0	
G52S	Downgradient	UR	650.0 - 647.0	
G52M	Downgradient	LR	640.0 - 636.0	To be installed if unit encountered
G52D	Downgradient	OS	634.0 - 631.0	
G53S*	Downgradient	UR	650.0 - 647.4	Existing well EX-21S
G53D*	Downgradient	OS	640.4 - 637.0	Existing well EX-21D
G54S#	Downgradient	UR	650.0 - 647.0	To be installed if unit encountered
G54M#	Downgradient	LR	640.0 - 636.0	To be installed if unit encountered
G54D#	Downgradient	OS	633.0 - 629.0	
G55S	Downgradient	UR	654.0 - 651.0	To be installed if unit encountered
G55M	Downgradient	LR	640.0 - 651.0	To be installed if unit encountered
G55D	Downgradient	OS	632.0 - 636.0	
G56S	Downgradient	UR	654.0 - 628.0	To be installed if unit encountered
G56M	Downgradient	LR	640.0 - 651.0	To be installed if unit encountered
G56D	Downgradient	OS	632.0 - 636.0	
G57S	Downgradient	UR	653.9 - 628.0	Existing well EX-22S
G57D	Downgradient	OS	631.8 - 627.8	Existing well EX-22D

\* Existing monitoring well; see "Comments" column for existing well name

# Zone of Attenuation Monitoring Well

"EX" designation denotes an existing well

Notes:

1. UR = Upper Radnor Till Sand; LR = Lower Radnor Till Sand; OS = Organic Soil; RR = Roxana Silt-Robin Member
2. Proposed monitoring well screen elevations are approximate elevations; wells will be screened at actual elevation of the geologic unit encountered during well drilling
3. Existing piezometers P-1 through P-5 to be used for water level measurements only until removed during applicable construction phase.

These Chemical Waste Unit downgradient monitoring wells will be monitored on an annual basis for the following parameters:

1. Groundwater Elevation
2. pH,
3. Polychlorinated Biphenyls (PCBs),
4. Specific Conductance,
5. Volatile Organic Compounds (USEPA Method 8260B), and
6. Semi-Volatile Organic Compounds (USEPA Method 8270C).

At a minimum, the three upgradient monitoring wells (G03, G05 and G07) will be analyzed quarterly for pH, Specific Conductance, and temperature.

The constituents listed above are those which have the potential to be found within the waste that will be accepted at the Chemical Waste Unit as it is described in the Operating Plan (Section 6).

As described in the permitted Groundwater Monitoring Plan, monitoring wells will be purged prior to each sampling event. This purge water will be treated as necessary prior to discharge in accordance with State and Federal requirements.

#### *Applicable Groundwater Quality Standards*

Applicable Groundwater Quality Standard (AGQS) values have been established for each of the constituents which are listed in Table 7-3. These values were established using background concentrations of each monitoring parameter from a minimum of four consecutive quarters. The statistical procedures used to determine the AGQS values, along with the permitted AGQS values for the permitted Clinton Landfill No. 3 are described in detail within the permitted Groundwater Monitoring Plan which is provided in Appendix M.

In the event that the concentration of a constituent within Table 7-2 is elevated above the established AGQS value, CLI will conduct a Groundwater Assessment to determine whether the exceedence is attributable to the Chemical Waste Unit.

#### *Groundwater Monitoring Period*

At least one groundwater sample will be collected from each of the six downgradient wells prior to first placement of waste in the Chemical Waste Unit. These samples will be analyzed for the annual parameter list identified above.

Sampling and analysis of the Chemical Waste Unit groundwater monitoring network is planned to continue into perpetuity. However, the monitoring requirements may be reduced by the appropriate agency upon a demonstration by the owner or operator that the reduced monitoring requirements are sufficient to protect human health and environment based on landfill leachate and groundwater conditions.



### **Summary of Groundwater Monitoring**

A comprehensive groundwater monitoring program has been designed for the proposed Clinton Landfill No. 3 Chemical Waste Unit to serve as an additional safeguard in order to:

1. Monitor the groundwater sources at the facility,
2. Verify that the landfill design is functioning as intended, and
3. Provide an early warning system in the unlikely event of a release.

All monitoring will follow strict quality control, quality assurance and chain of custody procedures. This groundwater monitoring program will verify that the facility design and construction are properly functioning to protect the public health, safety and welfare.

### **Leachate Monitoring**

Leachate samples will be collected each calendar month from the primary leachate collection system. The leachate samples will be analyzed for the following parameters prior to being mixed with water from any other sources:

- ☐ pH,
- ☐ Polychlorinated Biphenyls (PCBs), with identified Aroclors used for total calculation reported individually,
- ☐ Specific Conductance,
- ☐ Volatile Organic Compounds (USEPA Method 8260B), and
- ☐ Semi-Volatile Organic Compounds (USEPA Method 8270C).

Additional testing may be conducted as necessary to properly identify the physiochemical characteristics of the leachate prior to treatment and/or discharge in accordance with State and Federal discharge requirements.

Sampling methods and analytical procedures will comply with those specified in 40 CFR Part 136. Detailed sampling and analytical procedures are presented in Appendix M of this Application.

### **Surface Water Monitoring**

All stormwater run-off from the Chemical Waste Unit will be directed into Sediment Basin B, located immediately south of the Chemical Waste Unit. Stormwater management details are provided in Section 4 of this application.

Grab surface water samples will be collected from Sediment Basin B at the following frequencies:

- ☐ At least once prior to first placement of waste in the Chemical Waste Unit,
- ☐ Each calendar month that the Chemical Waste Unit receives TSCA-regulated PCB wastes, and
- ☐ Semi-annually following closure of the Chemical Waste Unit.





The surface water samples will be analyzed for the following parameters:

- ☐ Groundwater Elevation
- ☐ pH,
- ☐ Polychlorinated Biphenyls (PCBs), with identified Aroclors used for total calculation reported individually, Specific Conductance,
- ☐ Volatile Organic Compounds (USEPA Method 8260B), and
- ☐ Semi-Volatile Organic Compounds (USEPA Method 8270C).

Sampling methods and analytical procedures will comply with those specified in 40 CFR Part 136. Detailed analytical procedures are presented in Appendix M of this Application.

### **Ambient Air Monitoring**

CLI will conduct ambient air monitoring at four locations surrounding the Clinton Landfill No. 3 Chemical Waste Unit. Approximate monitoring locations are shown on Figure 7-3.

#### Methodology

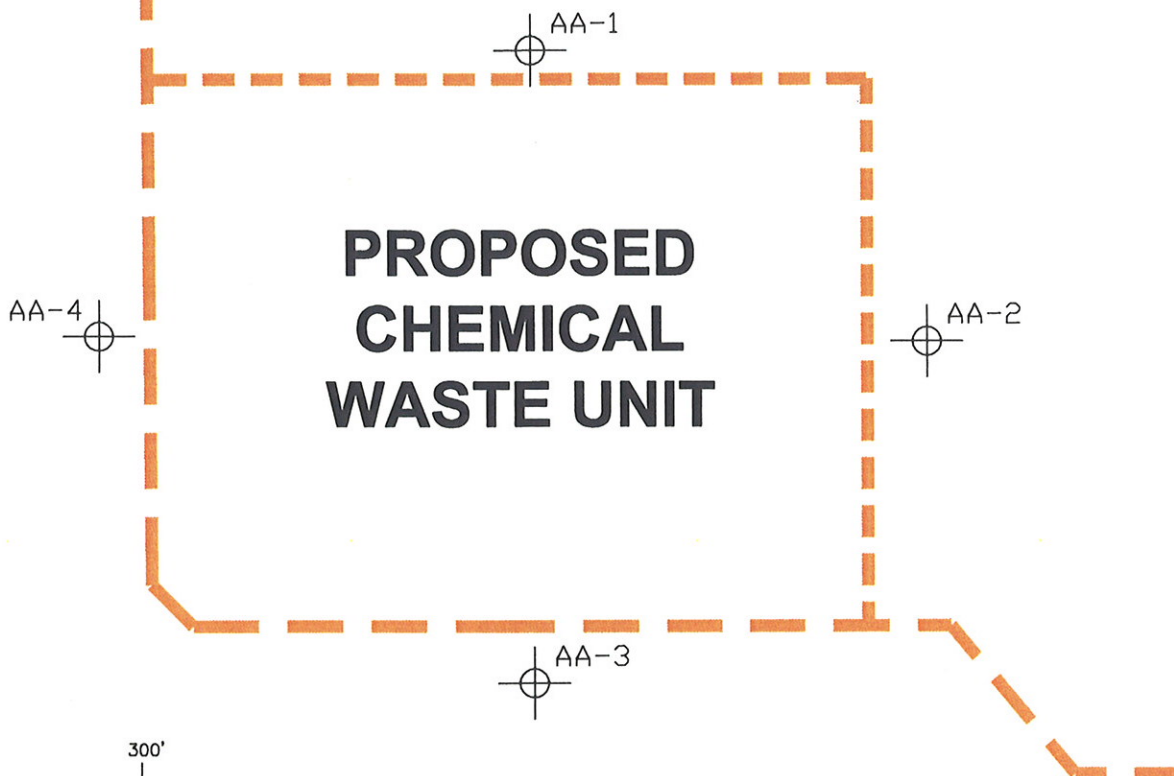
Ambient air monitoring will consist of collecting and analyzing 24-hour time-weighted average samples using high volume ambient air sampling equipment. Ambient air sampling will be conducted only during operating days in which TSCA-regulated PCB wastes are disposed in the Chemical Waste Unit. Further, CLI will select days during which the disposal location, disposal volume, and/or weather conditions are most likely to result in airborne emissions from the Chemical Waste Unit. Sampling activities will be scheduled such that all sampling devices begin collecting samples within approximately 1 hour of the beginning of the sampling event to ensure that samples are collected on a nearly simultaneous basis. Wind speed and direction will also be monitored and recorded near one of the sampling locations during each sampling event.

Each sample will be collected and analyzed for PCBs in accordance with USEPA Method TO-4. Samples will be submitted to a NELAC - accredited analytical laboratory under chain-of-custody protocols. The analytical method shall be capable of achieving a method detection limit no greater than 0.02 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).








**MSW UNIT**



0' 300'  
GRAPHIC SCALE

### **LEGEND**

-  APPROXIMATE PERMITTED CLINTON LF NO. 3 WASTE BOUNDARY
-  APPROXIMATE CLINTON LF NO. 3 CHEMICAL WASTE UNIT BOUNDARY
-  AA-1 APPROXIMATE AMBIENT AIR SAMPLING LOCATIONS

### **NOTES**

1. AMBIENT AIR MONITORING LOCATIONS ARE APPROXIMATE AND MAY VARY DEPENDING ON THE SIZE AND LOCATION OF THE ACTIVE AREA OF WASTE DISPOSAL.



**CLINTON LF NO. 3  
CHEMICAL WASTE UNIT**

**FIGURE 7-3  
AMBIENT AIR SAMPLING LOCATIONS**

APPROVED BY: JPV PROJ. NO.: 128017 DATE: OCT. 2007

### Sample Frequency

CLI will conduct ambient air monitoring at the following frequencies:

<b>TSCA - Regulated Waste</b>	<b>Minimum Sampling Frequency</b>
Background	Prior to initial PCB waste placement.
Initial	Three events during the first year of PCB waste placement, with sampling days selected as detailed above.
Periodic	Once per year provided the Initial sampling events yield no results exceeding both the background and notification levels. If any Periodic sample result exceeds both the background and notification levels, CLI will revert to the Initial frequency until three consecutive sample results are below the notification level.

### Notification Level

CLI will notify the USEPA of any sample results that indicates PCBs exceeding  $0.3 \mu\text{g}/\text{m}^3$ . Such notification will occur within 30 days of CLI's receipt of the analytical results. Only samples collected from locations determined to be downwind of the Chemical Waste Unit during the sampling event will be evaluated and compared to the background and notification levels.

