

3.0 SITE 2 – AREA A LANDFILL (OU1) AND AREA A WETLAND

Site 2 under the Navy's IRP includes the Area A Landfill and Area A Wetland. Both parts of Site 2 are addressed in this section; however, they are reviewed independently because decision documents and remedial actions are being completed independently.

This five-year review of the Area A Landfill portion of Site 2 is required by statute because hazardous substances, pollutants, or contaminants remain on site that do not allow for unlimited use or unrestricted exposure. An interim remedial action for the Area A Landfill soil OU (OU1) was completed in September 1997. The site has been monitored since the remedial action was completed to assess the effectiveness of the remedial action. Data collected during the monitoring program are evaluated within this report.

No decision documents have been prepared for the Area A Wetland portion of Site 2. This site is still being investigated under CERCLA. The need for remedial actions at the Area A Wetland will be determined in the future.

3.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 2 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

AREA A LANDFILL

| Event | Date |
|---|----------------|
| Landfill operations. | 1957 to 1973 |
| Final IAS completed. | March 1983 |
| Verification Step 1A Study. | February 1988 |
| Phase I RI completed. | August 1992 |
| Remedial design for Area A Landfill soil OU began. | 1994 |
| Area A Landfill Focused FS finalized. | May 1995 |
| Proposed Plan for Area A Landfill soil OU issued. | June 1995 |
| Public Meeting for Area A Landfill soil OU | June 1995 |
| ROD for Area A Landfill soil OU signed. | September 1995 |
| Remedial Design for Area A Landfill soil OU completed. | December 1996 |
| Interim Remedial Action for Area A Landfill soil OU began. | December 1996 |
| Phase II RI finalized. | March 1997 |
| Interim Remedial Action for Area A Landfill soil OU completed | September 1997 |
| Final Report for Interim Remedial Action at Area A Landfill issued. | March 1998 |
| Final Groundwater Monitoring Plan for Area A Landfill issued. | January 1999 |
| Groundwater Monitoring Program initiated. | October 1999 |

| Event | Date |
|--|-------------|
| Final Year 1 Groundwater Monitoring Report for Area A Landfill issued. | May 2001 |
| Draft Final Basewide Groundwater OU RI completed. | August 2001 |

AREA A WETLAND

| Event | Date |
|---|-------------|
| Wetland created with Thames River dredge spoils. | 1950s |
| Phase I RI completed. | August 1992 |
| Phase II RI completed. | March 1997 |
| Draft Final Basewide Groundwater OU RI completed. | August 2001 |

3.2 BACKGROUND

3.2.1 Area A Landfill

The Area A Landfill is a relatively flat area bordered by a steep, wooded hillside that rises to the south, a steep wooded ravine to the west, and the Area A Wetland to the north. Figure 3-1 shows the location of the Area A Landfill. The location of Site 2 relative to other IR sites is shown on Figure 1-2.

According to the IAS Report (NEESA, 1983), the landfill opened sometime before 1957. However, a 1957 aerial photograph shows no apparent landfilling, which may indicate a somewhat later start-up date. All combustible materials generated by base operations that were not salvageable were incinerated, and the residues were disposed in the DRMO, Goss Cove, and Area A Landfills. The base incinerator, which was located in the Lower Subbase along the waterfront at the present location of Building 478, ceased operation in 1963. From 1963 to 1973, refuse and debris were disposed in the Area A Landfill. Landfilling operations ceased in 1973. The thickness of the landfill materials is estimated to range from 10 to 20 feet, based on test boring data.

The area fill method was reportedly used in landfill operations. New refuse was dumped along the face of previously deposited refuse and covered with earth. The cover material used on the landfill was sand and gravel obtained from the Groton water supply reservoir. After closure, a concrete pad was constructed in the southwestern portion of the landfill, adjacent and to the northeast of Building 373, for above-ground storage of industrial wastes. Up to the time of the IRA at the Area A Landfill, the pad was still in existence. In the early 1980s, 42 steel drums, 87 transformers [mineral oil and polychlorinated biphenyls (PCB)], and 60 to 80 electrical switches were found to be stored on the pad. Two transformers and several electrical switches were reportedly leaking. Past leakage of oil was also evident. Most drums were stacked on wooden pallets, and those having PCB labels were covered and bound with plastic sheeting. All these materials were properly disposed off site.

The IAS Report indicated that refuse, including steel drums, oxygen candles, wood and metal scrap, concrete, and tires, was exposed at the edge of the landfill adjacent to the wetland. The IAS Report also stated that petroleum compounds had recently been poured from containers and had flowed into the Area A Wetland at two locations (northwestern portions of the landfill). According to the report, when batteries were overhauled, spent sulfuric acid solution was transferred to barrels and transported to the Area A Landfill for disposal. The acid was poured into trenches dug with a bulldozer and subsequently covered with soil. Based on records, established policy, and interviews, the potential for radioactive material having been disposed on site is considered to be effectively zero.

During a 1988 inspection of the site, iron floc was observed along the toe of the slope of the landfill, extending from the dike to the eastern end of the deployed parking lot. Iron floc occurs when groundwater with high concentrations of iron discharges to an oxygen-rich environment. Bacteria use the iron and oxygen to form the orange iron floc. The slope of the landfill had been covered with fill, and material in the landfill was not visible. Sand bags, salt, supplies, and equipment were stored on top of the landfill. Several transformers, underground storage tanks, crane weights, and other equipment were previously stored on the concrete pad in the southwestern portion of the landfill.

A two-phase RI was conducted to determine the nature and extent of contamination at the Area A Landfill. The Phase I RI field investigation was conducted from 1990 to 1992 (Atlantic, 1992). The Phase I RI of the Area A Landfill consisted of test borings, monitoring well installation, and soil and groundwater sampling. Landfill materials that were encountered included glass, brick, wood, plastic, and ash intermixed with sand and gravel material used as cover. The Phase I RI concluded that several risk exposure scenarios exceeded acceptable regulatory levels and that a FS should be performed for the Area A Landfill site.

The Phase II RI field investigation was conducted from 1993 to 1995 (B&RE, 1997a). The Phase II RI of the Area A Landfill consisted of test borings, monitoring well installation, and soil and groundwater sampling. The Phase II RI concluded that shallow groundwater contamination (i.e., VOCs, PCBs, and inorganics) exists at the site, the landfill soil may pose a threat to human receptors due to concentrations of PCBs, and chemicals in the soil could adversely impact ecological receptors. The Phase II RI recommended that, in addition to the installation of the landfill cover system, institutional controls including access/use restrictions and groundwater monitoring should be implemented at the site.

A low-permeability cover system was designed and installed on the Area A Landfill as an IRA for soil at the site. Investigations were conducted to support the design of the cover system. Installation of the cover system was completed in September 1997. The CBU Drum Storage Area (Site 1) and the Rubble Fill Area at Bunker A-86 (Site 4) were also addressed during the remedial action at the Area A Landfill.

The CBU Drum Storage Area (Site 1), formerly located within the boundary of the Area A Landfill, was capped at the same time as the landfill and a NFA Decision Document was signed for the site. The Rubble Fill Area at Bunker A-86 (Site 4) was located along the southern boundary of the Area A Landfill. Construction debris and contaminated soil and sediment from the site were removed as part of a time-critical removal action and incorporated into the Area A Landfill subgrade. After the removal action only exposed bedrock was left at the former Rubble Fill Area at Bunker A-86. A NFA Decision document was also signed for this site. A majority of the Area A Landfill is paved and is currently used for storage of equipment and vehicles. Access by military personnel to most of the site is unrestricted.

The groundwater at the Area A Landfill is currently being monitored under a long-term groundwater monitoring program. The groundwater at the site is also being investigated as part of the Basewide Groundwater OU RI. A draft final version of the RI Report was issued in August 2001 (TtNUS, 2001e). The RI recommended that the monitoring program be continued to gather data to evaluate long-term trends in contaminant concentrations and the decision to proceed to an FS should be made after sufficient data have been collected and evaluated.

3.2.2 Area A Wetland

The Area A Wetland is located north of the Area A Landfill (see Figures 1-2 and 3-1). The location of the Area A Wetland was undeveloped, wooded land and possibly wetland until the late 1950s. In the late 1950s, dredge spoils from the Thames River were pumped to this area and contained within an earthen dike that extends from the Area A Landfill to the southern side of the Area A Weapons Center.

The Area A Wetland is underlain by dredge spoils that consist of silt and clay with traces of fine sand and shell fragments. The thickness of dredge spoils ranges from 25 to 35 feet on the southern side of the wetland, adjacent to the landfill, and from 10 to 15 feet on the northeastern side of the wetland. The total volume of dredged material in the wetlands is approximately 1.2 million cubic yards.

There is a small pond located at the southern portion of the wetland, and between 1 and 3 feet of standing water is present during all seasons. Phragmites is the predominant type of vegetation. It was reported that pesticide "bricks" were placed on the wetland ice during winter and allowed to dissolve as a mosquito control measure. These "bricks" consisted of formulated (water-soluble) 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane (DDT) and were used in the 1960s, prior to the 1972 ban on 4,4'-DDT.

A two-phase RI was conducted to determine the nature and extent of contamination at the Area A Wetland. The Phase I RI field investigation was conducted from 1990 to 1992 (Atlantic, 1992). The Phase I RI of the Area A Wetland consisted of test borings, monitoring well installation, and soil,

sediment, and groundwater sampling. The Phase I RI concluded that several risk exposure scenarios exceeded acceptable regulatory levels and that an FS should be performed for the Area A Wetland site.

The Phase II RI field investigation was conducted from 1993 to 1995 (B&RE, 1997a). The Phase II RI of the Area A Wetland consisted of test borings, monitoring well installation, and sediment, surface water, and groundwater sampling. The Phase II RI concluded that little evidence of surface water or groundwater contamination exists at the site, the site may pose a risk to a construction worker due to potential exposure to manganese in the groundwater, and significant pesticide, PCB, and PAH concentrations exist in site soil and sediments. The recommendations in the Phase II RI indicated that an FS should be conducted for this site that evaluates a limited action alternative. The alternative should include groundwater monitoring and access/use restrictions.

3.3 REMEDIAL ACTIONS

Based on the results of the RI/FS process, it was determined that a remedial action was necessary for the Area A Landfill soil OU. A ROD for the soil OU was signed in September 1995 (Navy, 1995). The following sections describe the process used to select and implement the appropriate remedial action for the soil OU at the Area A Landfill.

The groundwater OU for the Area A Landfill site is still being investigated and final recommendations for the OU will be determined when sufficient data are collected and evaluated.

The Area A Wetland is still being investigated and no remedial alternatives have been developed for the site; therefore, the Area A Wetland is not discussed in the following sections.

3.3.1 Remedy Selection

An FFS for the Area A Landfill (Atlantic, 1995c) was completed in response to the recommendations of the Phase I and Phase II RIs. The FFS evaluated several remedial alternatives. The FFS concluded that the off-site disposal and off-site incineration alternatives would provide superior protection of the environment, but that the capping alternative would be more cost effective than the incineration alternative. The capping alternative was selected as the preferred remedial alternative for the Area A Landfill soil OU. The alternative was presented in the Proposed Remedial Action Plan (PRAP) for the Area A Landfill soil OU in June 1995 and was formally selected in the ROD that was signed in September 1995.

Based on ARARs and risk assessment results, the following remedial action objectives (RAOs) were selected for the soil OU at Area A Landfill:

- Protect potential human and ecological receptors from exposure to contaminated soil.
- Reduce contaminant migration from the site by preventing exposure of contaminated soils to wind and erosive elements and by preventing infiltration of rainwater through contaminated areas of the unsaturated zone.

A remedy was selected for the Area A Landfill to meet the RAOs. The selected remedy, as defined in the ROD, consisted of the following components:

- Access Restrictions – Access to contaminated areas of the site was to be limited via perimeter fencing and institutional controls. Access was to be limited to workers and other persons having business in these areas. The institutional controls would provide notice of hazardous materials at the site and ensure maintenance of cap integrity, worker protection, and other considerations.
- Site Grading and Stormwater Management – As part of the cap installation process, the site was to be graded to promote runoff and run-on. In addition, a groundwater interception system was to be installed to collect shallow groundwater flowing to the landfill and reroute it around the landfill to reduce contact of the groundwater with landfill contents/soils.
- Horizontal Barrier Cap Installation – A low-permeability cap, covering approximately 13 acres, was to be installed over contaminated areas of the Area A Landfill. The components of the cap system were to vary depending on location. The final cover system in the plateau areas was to consist of the following components in ascending order: bedding/gas collection layer, geosynthetic clay liner and geomembrane, drainage layer/subbase, woven geotextile, base course, and bituminous concrete surface course. The final cover system along the side slope areas was to consist of the following components in ascending order: bedding/gas collection layer, non-woven geotextile, cohesive backfill, textured geomembrane, drainage layer, non-woven geotextile, and riprap.
- Leachate Collection and Treatment – A leachate collection system was to be considered to stabilize the cap and to further contain landfill wastes. The system was to isolate and collect leachate for treatment and/or disposal. A pre-design study was to be completed to determine the need for such a system and, if necessary, the type of system that would be required.
- Post-Closure Groundwater Monitoring – The groundwater at the site was to be monitored after the installation of the cap system to assess the impacts of the cap system. The results were to be used to determine the need for groundwater remediation.

3.3.2 Remedy Implementation

The Remedial Design for the Area A Landfill soil OU began in 1994. It was completed for the Navy by two different contractors, Atlantic and B&R Environmental. Additional field work (i.e., field survey, geotechnical field investigation, and geotechnical laboratory testing program) was conducted to collect the data necessary to complete the design. An extensive groundwater modeling study was also completed to address design issues (i.e., leachate collection system, slope stability, etc.). The remedial design was completed in phases and was finalized in December 1996 (B&RE, 1996b).

The final cover system developed during the design generally included all the components of the system included in the ROD. Minor modifications were made as a result of normal refinement of details during the design. The two most significant modifications were the following:

- No leachate collection system
- Increased protection at the toe of the sideslope area

The decision for not including a leachate collection system was based upon the results of the groundwater modeling study. For the design, the riprap layer at the toe of the sideslope was replaced with a gabion basket system to provide increased resistance to shallow-based stability failures at the toe of slope and to prevent potential hydrostatic uplift on the low-permeability component of the sideslope cap system. A comparison of the ROD and design cap components is provided below.

Plateau Areas

| Cap Components in Plateau Areas in ROD | Cap Components in Plateau Areas in Final Design |
|---|---|
| • Bedding/gas collection layer | • Granular bedding/gas management layer (12-inch thick) and passive gas vent system |
| • Geosynthetic clay liner and geomembrane | • Geosynthetic clay liner and 40-mil low-density polyethylene (LDPE) geomembrane |
| • Drainage layer/subbase | • Granular drainage layer (12-inch thick) |
| • Woven geotextile | • Woven geotextile |
| • Base course | • Base course (6-inch thick) |
| • Bituminous concrete surface course | • Bituminous concrete (3-inch thick) |

Sideslope Areas

| Cap Components in Sideslope Areas in ROD | Cap Components in Sideslope Areas in Final Design |
|---|---|
| • Bedding/gas collection layer | • Granular bedding/gas management layer (12-inch thick) and passive gas vent system |
| • Non-woven geotextile | • Non-woven geotextile |
| • Cohesive backfill | • Cohesive backfill (6-inch thick) |
| • Textured geomembrane | • 40-mil LDPE textured geomembrane |
| • Drainage layer | • Granular drainage layer (12-inch thick) |
| • Non-woven geotextile | • Non-woven geotextile |
| • Riprap | • Riprap (12-inch thick)/gabion basket system |

The Navy's Remedial Action Contractor (RAC) mobilized to the site to begin preliminary construction activities in December 1996, and the IRA was completed in September 1997. Details regarding the IRA are summarized in the Final Report for IRA at Area A Landfill (B&RE, 1998). The most significant change to the IRA that occurred during the remedial action was the inclusion of soil material that was excavated from Site 4 under the cap. This change resulted in a 2.8-foot elevation increase in one area of the landfill that necessitated modifications to the cover system that was installed along the slopes of three drainage channels.

To ensure the quality of the IRA, quality control testing and inspection were completed during the remedial action in accordance with the Construction Quality Control (CQC) Plan and the Material Quality Assurance/Construction Quality Assurance (MQA/CQA) Plan. Two non-conformances were noted during quality control testing and inspection, but neither were regarded as significant enough to affect the performance of the cap system.

The cost estimate for implementation of the preferred remedial alternative was estimated at \$5,700,000 in the ROD. This estimate included costs associated with a groundwater collection and treatment system, cap O&M, and groundwater monitoring. A revised estimate was prepared during the remedial design that included only construction costs. The estimated cost for implementation of the remedial design was approximately \$4,500,000. This estimate did not include costs associated with a groundwater collection and treatment system, cap O&M, or groundwater monitoring. The actual final cost for implementation of the remedial design was approximately \$6,000,000. The major reason for the cost increase was the removal action that was completed at Site 4 concurrent with the implementation of the remedial design.

To meet the land use control requirements in the ROD, the Navy has prepared and implemented an instruction [i.e., SOPA (ADMIN) New London Instruction 5090.18 (Navy, 2000b)] to restrict use at IR sites

at NSB-NLON. The instruction defines the Navy's policy regarding ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater in IR sites.

Other components of the remedial action, including long-term groundwater monitoring and O&M, are discussed below in Section 3.3.3.

3.3.3 System Operations/Operation and Maintenance

The Navy implemented a monitoring program at the Area A Landfill in October 1999. The results of the program are being used to assess the effectiveness of the IRA. Quarterly sampling has been completed at the site since the program was initiated in accordance with the final Groundwater Monitoring Plan for Area A Landfill (TtNUS, 1999a). Six rounds of sampling have been completed as of May 2001. One annual report (TtNUS, 2001d) and five interim quarterly reports (TtNUS, 2000a, 2000b, 2000c, 2001a, and 2001c) have been prepared to document the results of the monitoring program. These reports have been submitted to the USEPA and CTDEP for review and comment. The annual report includes a thorough evaluation of the first year of data collected under the program, and the quarterly reports provide a brief screening-level assessment of the quarterly data. The results of the program are discussed in Section 3.4.2.

Costs associated with groundwater monitoring were estimated at \$125,000 per year for 30 years in the ROD. No assumptions regarding frequency of sampling, analytical parameters, etc. were included with this cost estimate. The actual cost for 1 year (October 1999 to July 2000) of quarterly groundwater/surface water monitoring at the Area A Landfill, in accordance with the final Groundwater Monitoring Plan for Area A Landfill, is approximately \$210,000. This estimate includes the costs associated with sampling, analysis, validation, and reporting. Costs associated with preparing the Groundwater Monitoring Plan and installing the groundwater monitoring well/surface water monitoring network are not included in the estimate.

The Navy has not prepared or implemented an O&M plan for the Area A Landfill to date. A cost estimate for annual O&M has not been prepared, but it will be during preparation of the O&M plan. Actual O&M costs will be provided in the Second Five-Year Review Report.

3.4 FIVE-YEAR REVIEW FINDINGS

3.4.1 Site Inspection

A site inspection was conducted at Site 2 on April 10, 2001. The focus of the site inspection was the Area A Landfill. Weather conditions during the inspection were favorable, with mild temperatures and no

precipitation. Representatives from the Navy, USEPA, CTDEP, and TtNUS participated in the inspection. Photographs taken of the site during the site inspection are provided in Appendix A. A site inspection checklist was completed during the inspection. The completed checklist is provided in Appendix B.

The site inspection included visual observations of the current condition of the engineered landfill cap system at Site 2. During the site inspection the team found that the land use for the site has remained unchanged since the IRA was completed. The Navy has continued to use the area for equipment storage and vehicle parking. Signs were also noticed during the inspection at the entrances to the site, warning access is only for authorized users and personnel should not dig at the site. In general, the site inspection found that the cap system was working as intended. However, a number of items were identified during the site inspection that if not addressed, could negatively affect the long-term performance of the cap system. These items are noted in the site inspection checklist provided in Appendix B. The items and their potential long-term impacts on the cap system are summarized below.

- Vegetation has begun to grow along the edge of the asphalt covering the plateau and the riprap covering the sideslopes. The root systems of the vegetation could penetrate the cap system.
- Sediment and vegetation clog portions of the northern drainage channels (i.e., A and C). The affected portions of the channels are shown on Figure 3-1. If the material is not removed, it may result in surface water overtopping the channels and flowing across the cap system.
- Heavy equipment has been improperly stored on the cap resulting in minor damage to the asphalt. The damage mainly consists of holes in the asphalt which allow surface water to penetrate. This could result in further deterioration of the asphalt during freeze-thaw cycles. It should be noted that the asphalt was not considered as one of the cap components, and therefore damage to the asphalt does not indicate damage to the cap system.
- Longitudinal cracks have formed in the asphalt. If the cracks are not sealed, surface water will penetrate the asphalt and further deteriorate the asphalt during freeze-thaw cycles.
- Monitoring wells that are not part of the groundwater monitoring program have not been maintained or properly abandoned. One monitoring well was found to be completely unprotected (i.e., no protective cover or j-plug), providing a direct conduit to the groundwater aquifer beneath the site.
- A small depression was discovered in the riprap along the toe of the landfill, at the southwestern end. The area is shown on Figure 3-1. It appears that surface water runoff is channeled through this area

which may be causing erosion of material underlying the riprap. If the situation is not addressed, the long-term impact could be that the cap system is impacted in this location.

- Fencing is in place around the site and signs are posted at the entrances of Site 2 that warn access is only for authorized users and a cap is in place and no digging is allowed. However, at least one of the gates to the site is left open, resulting in no physical access restrictions for military personnel to most of the site. The lack of physical access restrictions could result in the improper use of the site.

3.4.2 Document and Analytical Data Review

3.4.2.1 Document Review

The documents that were reviewed for the five-year review are listed below, and key information obtained from the documents is summarized in the following paragraphs.

- ROD, Source Control Operable Unit, Area A Landfill
- Revised Design Analysis Report for Area A Landfill
- Final Report for Interim Remedial Action at Area A Landfill
- SOPA (ADMIN) New London Instruction 5090.18
- Groundwater Monitoring Plan for Area A Landfill

A review of the ROD for the Area A Landfill provided the RAOs, ARARs, and a description of the selected remedy for the site. The review also provided the cost estimate for the remedial alternative.

A review of the Revised Design Analysis Report for Area A Landfill provided the details of the design of the engineered control cap. The design includes the final cap components that were subsequently compared to the components included in the ROD. The design also includes a detailed cost estimate for construction of the cap.

A review of the Final Report for Interim Remedial Action at Area A Landfill provided the details of the cap construction activities and the changes made to the design during construction. The report also summarizes the quality assurance and control testing and inspections that were performed during the construction of the cap.

A review of New London Instruction 5090.18 provided the approach to be used for land use controls at NSB-NLON. The instruction details the restrictions on ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites at NSB-NLON.

A review of the final Groundwater Monitoring Plan provided the monitoring well network to be used for the long-term groundwater monitoring program. The plan also details the analytical program, monitoring criteria, and data evaluation approach.

3.4.2.2 Data Review

The Navy implemented a monitoring program at the Area A Landfill in October 1999. The results of the program are being used to assess the effectiveness of the IRA. A summary of the conclusions and recommendations from the Year 1 Annual Report is provided below. Tables 3-1 and 3-2 summarize the groundwater and surface water analytical data, respectively, that were collected during Rounds 1 through 4 of the program. The chemicals provided in the tables are the COCs identified in the Groundwater Monitoring Plan. The criteria used to screen the data are also provided in the tables. The primary criteria are site-specific Surface Water Protection Criteria (SWPC), and the secondary criteria are the Federal AWQC and the Connecticut WQSS. Figures 3-2 and 3-3 are tag maps showing groundwater and surface water data, respectively, that exceeded applicable criteria.

The data evaluation completed for the Annual Report showed that concentrations of VOCs and SVOCs for the initial four rounds of groundwater monitoring did not exceed any SWPC. Additionally, no concentrations of VOCs or SVOCs exceeded any secondary monitoring criteria. Evaluation of the inorganic chemical data showed that some concentrations of arsenic exceeded the SWPC. Additionally, one detected concentration of zinc exceeded the SWPC. Some detected concentrations of copper, chromium, lead, and zinc were in excess of the secondary screening criteria; however, none of the concentrations exceeded the respective SWPC.

A statistical evaluation of the data was also completed for the annual report. Contaminant concentrations detected in upgradient monitoring wells (2LMW20S, 2WMW21S, and 4MW1S) were compared to contaminant concentrations detected in downgradient monitoring wells. The statistical comparisons indicated that upgradient and downgradient concentrations of both organic and inorganic COCs were similar, with the exception of total arsenic. The average concentrations for total arsenic, although currently above the SWPC, show a slight downward temporal trend. A similar trend was shown for dissolved arsenic concentrations.

Concentrations of arsenic in groundwater at the Area A Landfill are often near the detection limit, with many of the results qualified as estimated. Geochemical conditions in and near the downgradient side of the Area A Landfill are neutral to slightly acidic and mildly to strongly reducing. Under these conditions, the arsenic species present in groundwater will be predominantly the reduced form [i.e., As(III) or arsenite] and as the neutral molecule H_3AsO_3 . Similarities in the total and dissolved concentrations tend to support the lack of any association with particles.

The groundwater analytical data were compared to surface water data collected from the Area A Wetland for the annual report. Detections of arsenic above the SWPC were noted in several surface water samples (SG-22, SG-23, and SG-24) during Round 1. Arsenic was also detected at higher concentrations in the groundwater samples collected from adjacent monitoring wells during Round 1, indicating that groundwater is discharging and mixing with surface water in this area. A similar condition exists with lead at SG-18 and the adjoining well location. Lead was detected in the surface water and groundwater samples at concentrations slightly in excess of the secondary screening criteria. Several other metals (copper, chromium and zinc) were detected in some of the surface water samples in excess of secondary screening criteria; however, only arsenic was detected above the SWPC.

The following recommendations were made in the annual report.

- Consideration should be given to reducing the sampling frequency for VOCs because through four rounds of groundwater monitoring, no exceedances of primary or secondary monitoring criteria have been noted for VOCs.
- Consideration should be given to reducing some of the parameters currently being analyzed for the program. For example no pesticide or PCB as been positively detected in any sample. The reduction in the parameter list should occur at the end of Year 2.
- Maintain monitoring well integrity (well maintenance, well development) in case of extended monitoring.
- Discuss endpoints for groundwater monitoring if current trends continue.

3.4.3 ARAR and Site-Specific Action Level Changes

The IRA implemented for the soil at the Area A Landfill includes an engineered cap system, land use controls, groundwater monitoring, and O&M. ARARs and to be considereds (TBCs) were reviewed to determine whether there have been changes since the Remedial Design report and final Groundwater Monitoring Plan were issued. Listings of chemical-specific, location-specific, and action-specific ARARs, advisories and guidance (TBCs) which were considered in the ROD are listed on Tables 3-3, 3-4, and 3-5, respectively. With the exception of monitoring criteria, the ARARs were either addressed during construction or selection of the remedy and are no longer applicable, or have not been amended since the Remedial Design and final Groundwater Monitoring Plan. Changes associated with monitoring are addressed in the response to Question 2 of Section 3.2, Assessment.

The ERA for the Area A Landfill indicated that the chemicals detected in the surface soil present a potential risk to ecological receptors. The site was subsequently capped, which eliminated the exposure pathway. Therefore, any changes in the screening values since the completion of the ERA would not impact the effectiveness of the IRA.

3.5 ASSESSMENT

The following conclusions support the determination that the remedy for the Area A Landfill soil OU is currently protective of human health and the environment.

Question 1. Is the remedy functioning as intended by the decision documents?

- ***HASP/Contingency Plan:*** A groundwater monitoring program is being implemented at the Area A Landfill. The results of the program are being used to evaluate the cap's performance regarding minimizing contaminant migration. The data do not indicate any significant contaminant migration concerns. Should groundwater data indicate the need to evaluate additional remedial actions at some point in the future, the Navy will perform the evaluation at that time.
- ***Implementation of Institutional Controls and Other Measures:*** Institutional controls associated with the Area A Landfill are being implemented in accordance with New London Instruction 5090.18. Fencing is in place around the site and signs are posted at the entrances of Site 2 that warn access is only for authorized users and a cap is in place and no digging is allowed. These controls meet the intent of the Access Restriction RAO discussed on p. 3-6. However, at least one of the gates to the site is left open, resulting in no physical access restrictions for military personnel to most of the site. The lack of physical access restrictions could result in the improper use of the site.
- ***Remedial Action Performance:*** An engineered landfill cap system was installed at the Area A Landfill. This cap is currently effective in limiting direct exposure to contaminated soil and minimizing contaminant migration from the site. A groundwater monitoring program is being implemented to evaluate the cap's performance regarding minimizing contaminant migration. Proper O&M is necessary to maintain proper long-term performance of the cap system.
- ***System Operations/O&M:*** Installation of the engineered cap system was completed in September 1997. The system is still functioning as intended, but no O&M has been performed at the site since installation was completed. The items noted in Section 3.4.1 and Section 3.6 should be addressed. An O&M plan should be developed and implemented.

- **Cost of Operations/O&M:** Actual costs for the current groundwater monitoring program are approximately \$210,000 per year. No actual O&M costs for the cap system are available at this time.
- **Opportunities for Optimization:** The frequency of sampling for the groundwater monitoring program may be able to be reduced from quarterly to semiannual. The pesticides and PCBs included on the analytical parameter list for the groundwater monitoring program may be able to be eliminated. Changes in the monitoring program will be made at the end of the second year of the program.
- **Early Indicators of Potential Remedy Failure:** There were deficiencies noted in the O&M being completed for the cap system. Currently, the deficiencies do not compromise the protectiveness of the remedy, but if they are left unaddressed, they could result in remedy failure in the future.

Question 2. Are the assumptions used at the time of the remedy selection still valid?

- **Changes in Standards and To Be Considereds:** ARARs and TBCs considered during preparation of the ROD were reviewed to determine changes since the Remedial Design and Final Groundwater Monitoring Plan were issued. As presented in Section 3.4.3 there have been no changes to currently relevant ARARs with the exception of monitoring criteria.

The primary monitoring criteria for the Area A Landfill are the Connecticut Surface Water Protection Criteria (SWPC). As discussed in Section 1.4 the SWPC were updated in April, 1999 but the SWPC for the chemicals of concern at the Area A Landfill have not changed. The secondary monitoring criteria for the Area A Landfill are the lower of the Federal Ambient Water Quality Criteria (AWQC) and the Connecticut Water Quality Standards (WQS). The Federal AWQC were last updated in April, 1999 and the Connecticut WQS were last updated in April 1997. A comparison of the old and new secondary criteria is presented in Table 3-6. The changes in the AWQC and WQS do not impact the protectiveness of the remedy.

- **Changes in Toxicity and Other Contaminant Characteristics:** There have been no changes in the human health toxicity criteria that will impact the primary or secondary monitoring criterion.
- **Changes in Risk Assessment Methodologies:** As discussed in Section 1.4, there have been no major changes in human health risk assessment methodology since the signing of the ROD.

Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

3.6 DEFICIENCIES

The major deficiency discovered during the five-year review was the lack of an O&M plan. The deficiencies that were noted during the inspection are summarized in Table 3-7.

3.7 RECOMMENDATIONS AND REQUIRED ACTIONS

Based on the results of the site inspection and review, the following recommendations and actions are required for Site 2.

- Prepare and implement an O&M plan for the Area A Landfill to address the deficiencies noted in Section 3.6.
- Continue the Groundwater Monitoring Program, but optimize the sampling frequency and analytical parameter list. Determine the appropriate remedial action for the groundwater OU, if necessary, when sufficient data has been collected.
- Consider further restricting access to the site.
- Continue enforcement of New London Instruction 5090.18.
- Complete RI/FS process for the Area A Wetland and determine the appropriate remedial action(s).

3.8 PROTECTIVENESS STATEMENT

The remedy at the Area A Landfill is currently protective of human health and the environment. The source of contamination is contained. The engineered cap system minimizes infiltration and subsequent contaminant migration and prevents direct contact with soil. A groundwater monitoring program is being implemented to verify that the cap is performing as designed. The results of the first year of the monitoring program suggest that the cap is performing as planned. Proper implementation of land use controls and O&M will maintain the effectiveness of the remedy into the future.

A protectiveness determination for the Area A Wetland cannot be made at this time. No remedy has been implemented for the Area A Wetland. When a remedy has been selected and implemented for the Area A Wetland, its protectiveness will be determined.

TABLE 3-1

**ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 1 OF 16**

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2LMW20S 2LGW20S-01 10/24/99 | 2LMW20S 2LGW20S-02 01/22/00 | 2LMW20S 2LGW20S-02-D 01/22/00 | 2LMW20S 2LGW20S-03 04/08/00 | 2LMW20S 2LGW20S-04 07/06/00 |
|--|---|--------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|
| VOCs (ug/L) | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.17 U | 0.17 U | 0.16 U | 0.16 U | 2.2 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.17 U | 0.17 U | 0.16 U | 0.16 U | 2.2 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.17 U | 0.17 U | 0.16 U | 0.16 U | 2.2 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.17 U | 0.17 U | 0.16 U | 0.16 U | 2.2 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 0.87 J | 2.1 U | 2 U | 2.1 U | 2.2 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | 1.1 U | 1 U | 1 U | 2.2 U |
| Pesticides/PCBs (ug/L) | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.21 U | 0.2 U | 0.21 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.21 U | 0.2 U | 0.21 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.21 U | 0.2 U | 0.21 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.021 U | 0.02 U | 0.021 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | 2.6 U/2.6 U | 2.6 U/2.6 U | 3.5 U/2.3 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.48 U/0.2 U | 0.57 U/0.2 U | 0.3 U/0.1 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.45 U | 0.3 U/0.3 U | 0.3 U/0.3 U | 2.4 U/2.1 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | 1 UJ/1 UJ | 1 UJ/1.4 U | 0.7 U/0.8 U | 1.3 U/1.5 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 3 U/1.6 U | 1.3 UJ/1.3 UJ | 1.3 UJ/1.3 UJ | 3.1 U/2.2 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 2.1 U/1.7 U | 1.8 U/1.8 U | 1.8 U/1.8 U | 1.8 U/2.1 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 42.8 U/24.4 U | 11.2/58.1 J | 35.9/7.8 J | 84.6/80.4 | 15.7 J/14.2 |
| Miscellaneous Parameters (mg/L) | | | | | | | |
| ALKALINITY | NA | NA | 98.3 | 88.6 | 90.7 | 152 | 68.1 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 20 U | 20 U | 20 U | 20 U | 20 U |
| CHLORIDE | NA | NA | 109 | 67.4 | 70.2 | 85 | 84.1 J |
| HARDNESS | NA | NA | 78.8 | 98.5 | 89.5 | 99.3 | 91.1 |
| SULFATE | NA | NA | 14 | 20 U | 20 U | 20 U | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 315 | 242 | 201 | 327 | 244 J |
| TOTAL ORGANIC CARBON | NA | NA | 2.6 | 2.1 J | 2.1 J | 1.4 | 1.6 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 2 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW21S 2WGW21S-01 10/25/99 | 2WMW21S 2WGW21S-02 01/23/00 | 2WMW21S 2WGW21S-03 04/08/00 | 2WMW21S 2WGW21S-04 07/05/00 |
|--|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,1,2,2-TETRACHLOROETHANE | 110 | NA | 5 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 5 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 5 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.15 UJ | 0.17 U | 0.15 U | 2.2 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.15 UJ | 0.17 U | 0.15 U | 2.2 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.15 UJ | 0.17 U | 0.15 U | 2.2 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.15 UJ | 0.17 U | 0.15 U | 2.2 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 1.3 J | 2.1 U | 2 U | 2.2 U |
| PHENANTHRENE | 0.077 | NA | 1 UJ | 1.1 U | 1 U | 2.2 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.22 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 2 U | 0.2 U | 0.22 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 2 U | 0.2 U | 0.22 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.2 U | 0.02 U | 0.022 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.011 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 8.8/7.2 J | 2.6 UJ/2.6 UJ | 4.2 U/2.7 U | 3 J/2.7 UJ |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.67 U/0.2 U | 0.3 UJ/0.1 UJ | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 1.4 U/0.87 U | 0.3 UJ/0.3 UJ | 0.3 U/0.2 U | 0.71 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 7.4/8.2 | 1 UJ/5.6 U | 6.2 J/5.2 J | 6.6 J/6.4 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/2 U | 5.8 U/2 U | 1.5 U/3 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 UJ/1.8 UJ | 1.8 U/3.4 J | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 3.7 U/3.8 U | 7.6 J/4.9 J | 1.3 U/7.4 U | 2.9 U/2.6 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 787 | 297 | 1620 | 1950 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 584 | 1030 | 236 | 570 |
| CHLORIDE | NA | NA | 4290 | 9740 | 8560 | 9920 J |
| HARDNESS | NA | NA | 1380 | 3580 | 3080 | 317 |
| SULFATE | NA | NA | 48.8 | 246 | 20 U | 200 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 7030 | 15100 | 14700 | 17100 J |
| TOTAL ORGANIC CARBON | NA | NA | 40.1 | 33.3 J | 39.1 | 37.7 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 3 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW38DS 2WGW38DS-01 10/26/99 | 2WMW38DS 2WGW38DS-02 01/21/00 | 2WMW38DS 2WGW38DS-03 04/07/00 | 2WMW38DS 2WGW38DS-04 07/20/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.17 U | 2 U | 0.17 U | 2 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.17 U | 2 U | 0.17 U | 2 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.17 U | 2 U | 0.17 U | 2 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.17 U | 2 U | 0.17 U | 2 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 0.75 J | 2 U | 2.1 U | 2.1 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | 2 U | 1.1 U | 2 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.21 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.21 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.21 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.02 U | 0.021 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 6.5 J/4.6 J | /5.1 J | 6 U/4 U | 2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | /0.2 U | 0.3 U/0.1 U | 0.22 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | /0.3 U | 0.3 U/0.2 U | 0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | /2.7 U | 2.8/1.7 | 4.8 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 6.3/4.4 U | /6.7 U | 4.6 U/5.2 U | 4.9 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | /1.8 U | 1.8 U/2.1 U | 1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 70.3 J/152 J | /27.7 J | 19.2/24.7 | 6.8 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 318 | 298 | 427 | 303 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 63.3 | 46.2 | 35.9 | 41.6 |
| CHLORIDE | NA | NA | 224 | 202 | 239 | 198 J |
| HARDNESS | NA | NA | 249 | | 237 | 201 |
| SULFATE | NA | NA | 94.1 | 69.6 | 35 | 55.7 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 716 | 760 | 841 | 813 |
| TOTAL ORGANIC CARBON | NA | NA | 17.1 | 15.1 J | 12.7 | 15.1 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 4 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW39DS 2WGW39DS-01 10/27/99 | 2WMW39DS 2WGW39DS-02 01/21/00 | 2WMW39DS 2WGW39DS-03 04/05/00 | 2WMW39DS 2WGW39DS-04 07/19/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 0.3 J |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.2 UJ |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.2 UJ |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.2 UJ |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.2 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 2 U | 2 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1 U | 1.1 U | 1.1 U | 0.2 UJ |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 5.4 J/3.8 U | 2.6 U/2.6 U | 2.6 U/3.2 J | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.41 U/0.2 U | 0.2 U/0.2 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | 0.3 U/0.3 U | 0.3 U/0.3 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/4.1 J | 2.2 U/1.3 U | 1 U/1.3 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | 1.3 UJ/1.3 U | 2.4 U/1.4 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.8 U/2.3 U | 1.8 U/1.8 U | 1.8 U/1.8 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 11.7 J/15.4 J | 11.1/7.2 J | 8.9/7.1 J | 6.1 J/17.2 |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 176 | 203 | 155 | 159 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 20 U | 914 | 65.5 | 65.8 |
| CHLORIDE | NA | NA | 274 | 452 | 508 J | 329 J |
| HARDNESS | NA | NA | 153 | 154 | 160 | 110 |
| SULFATE | NA | NA | 10 U | 20 U | 20 U | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 469 | 974 | 939 | 782 J |
| TOTAL ORGANIC CARBON | NA | NA | 4.3 | 137 J | 42 | 21 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 5 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW40DS 2WGW40DS-01 10/25/99 | 2WMW40DS 2WGW40DS-02 01/21/00 | 2WMW40DS 2WGW40DS-03 04/07/00 | 2WMW40DS 2WGW40DS-04 07/20/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 5 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 5 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 5 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 UJ | 0.19 U | 0.17 U | 0.15 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 UJ | 0.19 U | 0.17 U | 0.15 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 UJ | 0.19 U | 0.17 U | 0.15 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 UJ | 0.19 U | 0.17 U | 0.15 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 1.1 J | 2 U | 2 U | 2.5 U |
| PHENANTHRENE | 0.077 | NA | 1.1 UJ | 1.2 U | 1.1 U | 1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.29 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.29 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.29 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.02 U | 0.029 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.014 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 36.3/11.9 | 2.6 UJ/5.2 J | 10.3 U/17.9 J | 25.9 J/13.8 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.44 U/0.2 U | 0.3 UJ/0.1 UJ | 0.12 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 UJ/0.3 UJ | 0.3 UJ/0.3 UJ | 0.3 U/0.2 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 3.7 J/2.4 U | 1 UJ/3.2 U | 3.8 J/2.4 J | 5 J/1.8 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.6 U/2.3 U | 1.3 UJ/1.4 U | 2.3 U/1.6 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 UJ/1.8 UJ | 1.8 U/2.1 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 6.7 U/10.7 U | 6.8 J/10.8 J | 5.8 U/11.8 J | 4.7 U/3.2 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 1620 | 1160 | 1180 | 996 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 944 | 1280 | 179 | 1040 |
| CHLORIDE | NA | NA | 10500 | 9090 | 9350 | 10500 J |
| HARDNESS | NA | NA | | 2950 | 3070 | 3750 |
| SULFATE | NA | NA | 534 | 948 | 792 | 989 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 17500 | 15600 | 15900 | 16700 |
| TOTAL ORGANIC CARBON | NA | NA | 25.7 | 32.2 J | 3.3 | 24 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 6 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW41DS 2WGW41DS-01 10/28/99 | 2WMW41DS 2WGW41DS-02 01/21/00 | 2WMW41DS 2WGW41DS-03 04/07/00 | 2WMW41DS 2WGW41DS-04 07/20/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 5 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 5 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 5 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.17 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.17 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.17 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.17 U | 0.17 U | 0.17 U | 0.15 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 2 U | 2 U | 2.1 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | 1.1 U | 1.1 U | 1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.22 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.22 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.22 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.02 U | 0.022 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.011 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 10.4 J/12.1 J | 3.5 J/2.6 UJ | 18.4 J/29 J | 6 U/8.4 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.4 U/0.2 U | 0.3 UJ/0.1 UJ | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | 0.3 UJ/0.3 UJ | 0.3 U/0.2 U | 0.32 U/0.34 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 3.2 J/2.4 U | 1 UJ/2.5 U | 12.2/9.7 J | 3.9 J/4.8 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | 1.3 UJ/1.3 UJ | 2.5 U/8.3 J | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 UJ/1.8 UJ | 1.8 U/2.6 J | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 11.8 J/14.1 J | 7.5 J/6.6 J | 12.2 J/7.9 J | 6.8 U/4 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 1810 | 2030 | 2190 | 752 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 620 | 914 | 200 | 651 |
| CHLORIDE | NA | NA | 7790 | 9370 | 7730 | 7690 J |
| HARDNESS | NA | NA | 2210 | 2570 | 2620 | 2350 |
| SULFATE | NA | NA | 86.7 | 274 | 282 | 212 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 12900 | 15900 | 13400 | 13600 |
| TOTAL ORGANIC CARBON | NA | NA | 47 | 45.3 J | 41.2 | 65.2 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 7 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW42DS 2WGW42DS-01 10/28/99 | 2WMW42DS 2WGW42DS-02 01/21/00 | 2WMW42DS 2WGW42DS-03 04/05/00 | 2WMW42DS 2WGW42DS-04 07/20/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 5 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 5 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 5 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.91 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.91 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.91 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.91 U | 0.17 U | 0.17 U | 0.15 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 2 U | 2.1 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 6.1 U | 1.1 U | 1.1 U | 1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 21.8 J/23.3 J | 20.5 J/11.2 J | 6.2/30.6 | 10.1 U/12.6 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.82 U/0.2 U | 0.2 U/0.2 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | 0.3 UJ/0.3 UJ | 0.39 U/0.3 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 4.2 J/3.7 J | 1 UJ/2 U | 4.6 U/4.3 U | 3.3 J/2 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/6.5 J | 1.3 UJ/1.3 UJ | 3.8 U/2.2 U | 0.87 U/1 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 UJ/1.8 UJ | 1.8 U/3.6 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 6.2 J/23.9 J | 18.7 J/4.4 J | 9.7/6.2 J | 11 J/7.6 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 1460 | 1330 | 1080 | 467 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 1100 | 686 | 149 | 362 |
| CHLORIDE | NA | NA | 8120 | 7140 | 5500 J | 5140 J |
| HARDNESS | NA | NA | 2790 | 3940 | 1520 | 1380 |
| SULFATE | NA | NA | 165 | 193 | 149 | 152 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 12300 | 12900 | 9490 | 9310 |
| TOTAL ORGANIC CARBON | NA | NA | 32.7 | 29.3 J | 64.2 | 29.2 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 8 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW43DS 2WGW43DS-01 10/27/99 | 2WMW43DS 2WGW43DS-02 01/22/00 | 2WMW43DS 2WGW43DS-03 04/08/00 | 2WMW43DS 2WGW43DS-04 07/21/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 5 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 5 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 5 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | 0.19 U | 0.15 U | 2 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | 0.19 U | 0.15 U | 2 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.19 U | 0.15 U | 2 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.19 U | 0.15 U | 2 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 1.3 J | 2 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1 U | 1.2 U | 1 U | 2 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 12.2 J/11.9 J | 2.6 J/3 J | 16.8 U/13.4 U | 16.1 J/10.9 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.52 J/0.2 U | 0.3 UJ/0.1 UJ | 0.26 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | 0.3 U/0.3 UJ | 1.6 U/0.2 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 6.1 J/2.4 J | 1 UJ/9.6 J | 8.2 J/9.9 J | 8.3 J/5.5 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | 1.3 UJ/2.5 U | 6.2 U/11.2 J | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 UJ/1.8 UJ | 1.8 U/4.2 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 9.6 J/0.9 UJ | 10.6 J/3.8 U | 10.8 J/8.9 J | 5.3 U/4.9 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 1850 | 1680 | 2340 | 1200 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 1580 | 1030 | 236 | 1930 |
| CHLORIDE | NA | NA | 12900 | 12700 | 12600 | 13900 J |
| HARDNESS | NA | NA | 4120 | 4250 | 4070 | 4630 |
| SULFATE | NA | NA | 196 | 340 | 328 | 375 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 20900 | 19100 | 23500 | 24800 |
| TOTAL ORGANIC CARBON | NA | NA | 35.7 | 31.9 J | 34.1 | 48.5 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 9 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW44DS 2WGW44DS-01 10/28/99 | 2WMW44DS 2WGW44DS-02 01/22/00 | 2WMW44DS 2WGW44DS-03 04/09/00 | 2WMW44DS 2WGW44DS-04 07/20/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 5 U | | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 5 U | | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 5 U | | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.17 U | | 0.16 U | 0.15 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.17 U | | 0.16 U | 0.15 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.17 U | | 0.16 U | 0.15 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.17 U | | 0.16 U | 0.15 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | | 2 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | | 1 U | 1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.22 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.22 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.22 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | 0.02 U | 0.022 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | 0.01 U | 0.011 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | | 3.5 U/2.3 U | 3 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | 0.3 U/0.1 U | 0.27 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.32 U/0.3 U | | 0.3 U/0.31 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | | 1.9/0.8 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | | 1.3 U/1 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | | 1.8 U/2.1 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 21.2 J/15.5 J | | 13.4/9.6 | 6.7 U/6.4 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 146 | | 566 | 547 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 63.4 | | 46.2 | 54.6 |
| CHLORIDE | NA | NA | 1660 | | 1420 | 1980 J |
| HARDNESS | NA | NA | 718 | | 6.6 U | 730 |
| SULFATE | NA | NA | 11 | | 20 U | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 3020 | | 1910 | 3440 |
| TOTAL ORGANIC CARBON | NA | NA | 32.8 | | 9 | 10.3 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 10 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW45DS 2WGW45DS-01 10/26/99 | 2WMW45DS 2WGW45DS-02 01/23/00 | 2WMW45DS 2WGW45DS-03 04/08/00 | 2WMW45DS 2WGW45DS-04 07/20/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 0.79 J | 2.1 U | 2.1 U | 2.1 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | 1.1 U | 1.1 U | 1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.22 U | 0.2 U | 0.22 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.22 U | 0.2 U | 0.22 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.22 U | 0.2 U | 0.22 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.022 U | 0.02 U | 0.022 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.011 U | 0.01 U | 0.011 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 10.8/12.4 | 2.9 J/3.2 J | 11 U/9.6 U | 4.2 U/4.6 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.48 U/0.2 U | 0.3 U/0.1 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.85 U/0.92 U | 0.3 U/0.81 U | 0.3 U/0.86 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.5 J | 1 UJ/3.1 U | 3.5/1.8 | 1.4 J/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.8 U/1.8 U | 1.3 UJ/1.5 U | 0.8 U/1 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 U/1.8 U | 1.8 U/2.1 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 7.3 U/1.8 U | 10.8/4.5 J | 9.1/17.9 | 3.1 U/4.7 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 379 | 315 | 440 | 870 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 225 | 59 | 66.7 | 146 |
| CHLORIDE | NA | NA | 1490 | 1720 | 1970 | 4270 J |
| HARDNESS | NA | NA | 375 | 912 | 576 | 2470 |
| SULFATE | NA | NA | 15.8 | 20 U | 30.2 | 51.7 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 2590 | 3100 | 4470 | 7430 |
| TOTAL ORGANIC CARBON | NA | NA | 14.7 | 12.9 J | 12.3 | 16.4 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 11 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMW46DS 2WGW46DS-01 10/26/99 | 2WMW46DS 2WGW46DS-02 01/24/00 | 2WMW46DS 2WGW46DS-03 04/07/00 | 2WMW46DS 2WGW46DS-04 07/20/00 |
|--|---|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 5 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 5 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 5 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.17 U | 0.17 U | 0.15 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 1.2 J | 2 U | 2.1 U | 2.1 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | 1.2 U | 1.1 U | 1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.22 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.22 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.21 U | 0.2 U | 0.22 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.021 U | 0.02 U | 0.022 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.011 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 33.4/30 | 9.4 J/10.6 J | 24.4 J/31.6 U | 28.4 J/29.3 J |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.79 U/0.2 U | 0.3 UJ/0.1 UJ | 0.13 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 UJ/0.3 UJ | 0.3 UJ/0.3 UJ | 0.3 U/0.2 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 4.2 J/11.3 | 6 U/4.6 U | 17 J/6.5 J | 11.9 J/13.6 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.7 U/2.6 U | 8.6 U/1.3 UJ | 6.4 U/4 U | 0.87 U/1.5 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 UJ/1.8 UJ | 3.6 U/4.2 U | 3.8 U/3.8 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 10.9 U/9.3 U | 50.4 J/9.5 J | 146/8.2 J | 11.1 J/6.5 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 2220 | 1230 | 2780 | 2420 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 1800 | 1260 | 333 | 2410 |
| CHLORIDE | NA | NA | 16800 | 16300 | 16600 | 16800 J |
| HARDNESS | NA | NA | 5130 | 4610 | 5020 | 5030 |
| SULFATE | NA | NA | 149 | 437 | 100 U | 255 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 26300 | 26200 | 29200 | 29400 |
| TOTAL ORGANIC CARBON | NA | NA | 36.5 | 4.2 J | 29.8 | 63.2 |

TABLE 3-1

**ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 12 OF 16**

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 2WMMW47DS 2WGW47DS-01 10/25/99 | 2WMMW47DS 2WGW47DS-02 01/24/00 | 2WMMW47DS 2WGW47DS-03 04/05/00 | 2WMMW47DS 2WGW47DS-04 07/18/00 | 2WMMW47DS 2WGW47DS-04-D 07/18/00 |
|--|---|--------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|
| VOCs (ug/L) | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 UJ | 0.15 U | 0.17 U | 0.21 UJ | 0.2 UJ |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 UJ | 0.15 U | 0.17 U | 0.21 UJ | 0.2 UJ |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 UJ | 0.15 U | 0.17 U | 0.21 UJ | 0.2 UJ |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 UJ | 0.15 U | 0.17 U | 0.21 UJ | 0.2 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 1 J | 2 U | 2 U | 2.1 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1.1 UJ | 1 U | 1.1 U | 0.21 UJ | 0.2 UJ |
| Pesticides/PCBs (ug/L) | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.21 U | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.02 U | 0.021 U | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 26.6/27.6 | 11.8 J/12.2 J | 16.5/13 | 29.6 J/35.5 J | 30.4 J/32.4 J |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.63 U/1.1 U | 0.2 U/0.2 U | 0.1 U/0.1 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 2.1 U/3.2 U | 0.3 U/2.1 U | 0.32 U/0.42 U | 0.89 U/1.8 U | 1 U/1.3 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 5/2.4 U | 1 UJ/2.4 U | 2.3 U/1.8 U | 1.3 UJ/1.3 UJ | 1.3 UJ/1.3 UJ |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | 1.3 UJ/1.3 UJ | 1.5 U/2 U | 0.87 U/1 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 U/6.4 U | 1.8 U/1.8 U | 1.9 U/1.9 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 8 U/13.9 U | 12.4/7.4 J | 13.3/5.1 J | 8.2 J/13.6 J | 9.9 J/18.7 J |
| Miscellaneous Parameters (mg/L) | | | | | | | |
| ALKALINITY | NA | NA | 422 | 365 | 296 | 323 | 384 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 180 | 20 U | 65.5 | 106 | 109 |
| CHLORIDE | NA | NA | 1950 | 1500 | 1420 J | 3170 J | 3570 J |
| HARDNESS | NA | NA | 635 | 559 | 365 | 870 | 850 |
| SULFATE | NA | NA | 10 U | 20 U | 20 U | 20 U | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 2300 | 2790 | 2430 | 5680 J | 6020 J |
| TOTAL ORGANIC CARBON | NA | NA | 12.2 | 10.5 J | 11.4 | 10.3 | 13.8 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 13 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 3MW12D 3GW12D-01 10/28/99 | 3MW12D 3GW12D-01-D 10/28/99 | 3MW12D 3GW12D-02 01/24/00 | 3MW12D 3GW12D-03 04/07/00 | 3MW12D 3GW12D-03-D 04/07/00 | 3MW12D 3GW12D-04 07/20/00 |
|--|---|--------------------------------|---------------------------|-----------------------------|---------------------------|---------------------------|-----------------------------|---------------------------|
| VOCs (ug/L) | | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | 0.16 U | 0.16 U | 0.15 U | 0.17 U | 0.16 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | 0.16 U | 0.16 U | 0.15 U | 0.17 U | 0.16 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.16 U | 0.16 U | 0.15 U | 0.17 U | 0.16 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.16 U | 0.16 U | 0.15 U | 0.17 U | 0.16 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2.1 U | 2 U | 2 U | 2.1 U | 2.1 U | 2.1 U |
| PHENANTHRENE | 0.077 | NA | 1 U | 1 U | 1.1 U | 1 U | 1.1 U | 1.1 U |
| Pesticides/PCBs (ug/L) | | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.21 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.21 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.21 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.021 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | 3.8 U/3.8 U | 2.6 U/2.6 U | 3.5 U/2.3 U | 3.5 U/2.3 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.2 U/0.2 U | 0.24 U/0.2 U | 0.3 U/0.1 U | 0.3 U/0.1 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.57 U/0.66 U | 0.75 U/0.62 U | 0.3 U/0.41 U | 0.46 U/0.81 U | 0.54 U/0.83 U | 0.5 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | 2.4 U/2.4 U | 4.7 U/1 UJ | 1.1 J/0.8 U | 1.3 J/0.8 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.4 U/1.2 U | 1.2 U/1.2 U | 1.3 UJ/1.3 UJ | 3.7 U/1 U | 3.7 U/1 U | 3 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.7 U/1.7 U | 1.8 U/1.8 U | 1.8 U/2.1 U | 1.8 U/2.1 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 20.6 J/172 J | 27 J/26.7 J | 12/8.1 J | 4.1 U/1.9 U | 7.8/2.5 U | 5.8 U/7.6 U |
| Miscellaneous Parameters (mg/L) | | | | | | | | |
| ALKALINITY | NA | NA | 217 | 233 | 200 | 283 | 239 | 239 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 20 U | 26.4 | 20.5 | 23.1 | 25.6 | 39 |
| CHLORIDE | NA | NA | 887 | 885 | 964 | 886 | 888 | 813 J |
| HARDNESS | NA | NA | 536 | 498 | 448 | 389 | 408 | 359 |
| SULFATE | NA | NA | 93.6 | 93.7 | 85.8 | 63.5 | 63.7 | 70.5 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 1780 | 1720 | 1830 | 1950 | 1890 | 1760 |
| TOTAL ORGANIC CARBON | NA | NA | 3.6 | 4 | 3.9 J | 3.8 | 4.1 | 3.7 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 14 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 3MW12S 3GW12S-01 10/28/99 | 3MW12S 3GW12S-02 01/24/00 | 3MW12S 3GW12S-02-D 01/24/00 | 3MW12S 3GW12S-03 04/07/00 | 3MW12S 3GW12S-03-D 04/07/00 | 3MW12S 3GW12S-04 07/20/00 |
|--|---|--------------------------------|---------------------------|---------------------------|-----------------------------|---------------------------|-----------------------------|---------------------------|
| VOCs (ug/L) | | | | | | | | |
| 1,1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U | 1 U | |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U | 1 U | |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U | 1 U | |
| SVOCs (ug/L) | | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.15 U | 0.17 U | 0.17 U | 0.15 U | 0.15 U | |
| BENZO(A)PYRENE | 0.3 | NA | 0.15 U | 0.17 U | 0.17 U | 0.15 U | 0.15 U | |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.15 U | 0.17 U | 0.17 U | 0.15 U | 0.15 U | |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.15 U | 0.17 U | 0.17 U | 0.15 U | 0.15 U | |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 2 U | 2 U | 2 U | 2.1 U | |
| PHENANTHRENE | 0.077 | NA | 1 U | 1.2 U | 1.1 U | 1 U | 1 U | |
| Pesticides/PCBs (ug/L) | | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | |
| Inorganics (total/dissolved) (ug/L) | | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | 2.6 U/2.6 U | 2.6 U/2.6 U | 3.5 U/2.3 U | 3.5 U/2.3 U | |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.2 U/0.2 U | 0.87 U/0.2 U | 0.3 U/0.1 U | 0.3 U/0.1 U | |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.47 U/0.38 U | 0.3 U/0.56 U | 0.62 U/0.3 U | 0.31 U/0.28 U | 0.3 U/0.33 U | |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | 36.2 J/1 U | 1 UJ/1 UJ | 1.1 J/0.8 U | 1 J/0.8 U | |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.7 U/1.2 U | 1.3 UJ/1.3 UJ | 1.3 UJ/1.3 UJ | 2.9 U/1.1 U | 3 U/1.2 U | |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 U/1.8 U | 1.8 U/1.8 U | 1.8 U/2.1 U | 1.8 U/2.1 U | |
| ZINC | 123 | 58.2 ⁽³⁾ | 15.3 J/8.9 J | 6.1 J/31.8 J | 26.7/20.2 J | 11.4/13.9 | 20.4/17.2 | |
| Miscellaneous Parameters (mg/L) | | | | | | | | |
| ALKALINITY | NA | NA | 224 | 210 | 203 | 276 | 263 | |
| CHEMICAL OXYGEN DEMAND | NA | NA | 20 U | 23.1 | 20 U | 25.6 | 23.1 | |
| CHLORIDE | NA | NA | 970 | 913 | 1000 | 963 | 963 | |
| HARDNESS | NA | NA | 440 | 358 | 430 | 413 | 432 | |
| SULFATE | NA | NA | 98.1 | 74.4 | 85.1 | 85.6 | 85.4 | |
| TOTAL DISSOLVED SOLIDS | NA | NA | 1880 | 1730 | 1840 | 1890 | 1830 | |
| TOTAL ORGANIC CARBON | NA | NA | 4.3 | 3.8 J | 36.3 J | 4.1 | 4 | |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 15 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 3MW37S 3GW37S-01 10/28/99 | 3MW37S 3GW37S-02 01/22/00 | 3MW37S 3GW37S-03 04/09/00 | 3MW37S 3GW37S-04 07/20/00 |
|--|---|--------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 2 U | 2 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | 1 U | 1.1 U | 1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.21 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.21 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.2 U | 0.21 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.02 U | 0.02 U | 0.021 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | 2.6 U/2.6 U | 3.5 U/2.3 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.7 U/0.2 U | 0.3 U/0.1 U | 0.21 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | 0.3 U/0.3 U | 0.3 U/0.29 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | 1 UJ/1.1 U | 0.7 U/0.8 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.3 U | 1.3 UJ/2.4 U | 2.6 U/2 U | 0.87 U/1.6 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.8 U/1.8 U | 1.8 U/2.1 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 13.4 J/11.6 J | 18.3/6 J | 3.9 U/21.5 | 3.2 U/3.9 U |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 188 | 129 | 142 | 120 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 92.4 | 20 U | 20 U | 20 U |
| CHLORIDE | NA | NA | 91.9 | 238 | 179 | 107 J |
| HARDNESS | NA | NA | 172 | 138 | 150 | 116 |
| SULFATE | NA | NA | 19 | 21.9 | 20.6 | 20 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 283 | 481 | 471 | 336 |
| TOTAL ORGANIC CARBON | NA | NA | 4.2 | 3.5 J | 2.8 | 4 |

TABLE 3-1

ROUNDS 1 THROUGH 4 GROUNDWATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 16 OF 16

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 4MW1S 4GW01S-01 10/27/99 | 4MW1S 4GW01S-01-D 10/27/99 | 4MW1S 4GW01S-02 01/23/00 | 4MW1S 4GW01S-03 04/08/00 | 4MW1S 4GW01S-04 07/06/00 |
|--|---|--------------------------------|--------------------------|----------------------------|--------------------------|--------------------------|--------------------------|
| VOCs (ug/L) | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U | 2.1 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U | 2.1 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U | 2.1 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | 0.16 U | 0.17 U | 0.15 U | 2.1 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 2.1 U | 2 U | 2.1 U | 2.1 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | 1.1 U | 1.1 U | 1 U | 2.1 U |
| Pesticides/PCBs (ug/L) | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.21 U | 0.2 U | 0.21 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.21 U | 0.2 U | 0.21 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | 0.21 U | 0.2 U | 0.21 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.02 U | 0.021 U | 0.02 U | 0.021 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | 3.8 U/3.8 U | 2.6 U/2.6 U | 3.5 U/2.3 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.2 U/0.2 U | 0.53 U/0.2 U | 0.3 U/0.1 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | 0.3 U/0.3 U | 0.3 U/0.3 U | 0.3 U/0.26 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/4.7 | 2.4 U/2.4 U | 1 UJ/1.6 U | 0.7 U/0.8 U | 1.3 U/1.7 J |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | 1.2 U/1.2 U | 1.3 UJ/2 U | 0.8 U/1 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.7 U/1.7 U | 1.8 U/1.8 U | 1.8 U/2.1 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 7 J/5.6 J | 9.7 J/5.1 J | 26.8/51.3 J | 9.8/25.9 | 5.5 U/5.2 U |
| Miscellaneous Parameters (mg/L) | | | | | | | |
| ALKALINITY | NA | NA | 28.5 | 33.1 | 31.1 | 19.1 | 36.4 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 20 U | 20 U | 20 U | 20 U | 20 U |
| CHLORIDE | NA | NA | 18.1 | 18.3 | 23.9 | 80.2 | 39 J |
| HARDNESS | NA | NA | 105 | 134 | 57.3 | 82.7 | 65.7 |
| SULFATE | NA | NA | 57.7 | 53.9 | 43.1 | 38.9 | 45.2 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 186 | 192 | 156 | 254 | 156 J |
| TOTAL ORGANIC CARBON | NA | NA | 2.3 | 2.4 | 1.4 J | 1 U | 1.3 |

NOTES:

Bold numbers denote exceedance of primary or secondary monitoring criterion.

- 1 Surface Water Protection Criteria for substances in groundwater (CTDEP, January 1996).
 - 2 Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, freshwater) (USEPA, 1999a).
 - 3 Connecticut Water Quality Criteria for protection of human health from consumption of organisms (CTDEP, 1997).
 - 4 Hexavalent chromium
- J Estimated value
R Rejected value
U Undetected
NA Not available

TABLE 3-2

ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 1 OF 8

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | 3MSP01 3MSP01-01 10/24/99 | 3MSP01 3MSP01-02 01/23/00 | 3MSP01 3MSP01-03 04/08/00 | 3MSP01 3MSP01-04 07/21/00 |
|--|---|--------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | | | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | | | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | | | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | | | 2.1 U |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | | | 2.1 U |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | | | 2.1 U |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | | | 2.1 U |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | | | 3.5 |
| PHENANTHRENE | 0.077 | NA | 1 U | | | 2.1 U |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | | | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | | 0.33 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.45 U/0.3 U | | | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | | | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 8.1 U/4.5 U | | | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 8.8 U/1.7 U | | | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 45.3 U/37.2 U | | | 10.3/13.3 |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 161 | | | 88.7 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 34.3 | | | 20 U |
| CHLORIDE | NA | NA | 10.1 | | | 239 J |
| HARDNESS | NA | NA | 142 | | | 116 |
| SULFATE | NA | NA | 18.6 | | | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 252 | | | 522 |
| TOTAL ORGANIC CARBON | NA | NA | 9.7 | | | 3.4 |

TABLE 3-2

ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 2 OF 8

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | SG-18 SWSG18-01 10/27/99 | SG-18 SWSG18-02 01/23/00 | SG-18 SWSG18-03 04/05/00 | SG-18 SWSG18-04 07/18/00 | SG-18 SWSG18-04-D 07/18/00 |
|--|---|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|----------------------------|
| VOCs (ug/L) | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.17 U | | 0.15 U | 0.2 UJ | 0.2 UJ |
| BENZO(A)PYRENE | 0.3 | NA | 0.17 U | | 0.15 U | 0.2 UJ | 0.2 UJ |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.17 U | | 0.15 U | 0.2 UJ | 0.2 UJ |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.17 U | | 0.15 U | 0.2 UJ | 0.2 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2.1 U | | 2 U | 2 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | | 1 U | 0.2 UJ | 0.2 UJ |
| Pesticides/PCBs (ug/L) | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | 0.02 U | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | | 2.6 U/2.6 U | 2.7 U/2.7 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | 0.2 U/0.2 U | 0.1 U/0.1 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | | 0.3 U/0.3 U | 0.32 U/0.33 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | | 1 U/1 U | 1.3 U/1.3 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | | 3.8 U/1.3 U | 2.7 U/0.87 U | 2 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | | 1.8 U/1.8 U | 1.9 U/1.9 U | 2 J/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 31 J/49.4 J | | 31/33.8 | 27.8 J/4.1 U | 31.8 J/7.6 |
| Miscellaneous Parameters (mg/L) | | | | | | | |
| ALKALINITY | NA | NA | 46.6 | | 47.9 | 80.8 | 71.8 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 26.4 | | 20 U | 50.6 | 40.5 |
| CHLORIDE | NA | NA | 164 | | 95.5 J | 105 J | 104 J |
| HARDNESS | NA | NA | 99.5 | | 67 | 94 | 97 |
| SULFATE | NA | NA | 10 U | | 20 U | 20 U | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 268 | | 202 | 302 J | 275 J |
| TOTAL ORGANIC CARBON | NA | NA | 7.5 | | 3.4 | 9.7 | 9.9 |

TABLE 3-2

ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 3 OF 8

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | SG-19 SWSG19-01 10/27/99 | SG-19 SWSG19-02 01/23/00 | SG-19 SWSG19-03 04/05/00 | SG-19 SWSG19-04 07/19/00 |
|--|---|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | | 0.2 J | 0.1 J |
| XYLENES, TOTAL | NA | NA | 1 U | | 1 U | 0.57 J |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | | 2 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1.1 U | | 1 U | 0.16 J |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | | 2.6 U/2.6 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | 0.2 U/0.2 U | 0.14 U/0.16 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | | 0.3 U/0.3 U | 0.49 U/0.44 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 3.6 J/2.4 U | | 1 U/1 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | | 3.3 U/2.5 U | 5.2 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | | 1.8 U/1.8 U | 3.4 J/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 32 J/118 J | | 48.9/17.9 | 49.6 J/25.2 |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 48.6 | | 66.4 | 144 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 26.4 | | 20 U | 58.2 |
| CHLORIDE | NA | NA | 162 | | 121 J | 160 J |
| HARDNESS | NA | NA | 115 | | 78.4 | 150 |
| SULFATE | NA | NA | 14.5 | | 20 U | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 32 | | 248 | 452 J |
| TOTAL ORGANIC CARBON | NA | NA | 7.2 | | 3.9 | 12.6 |

TABLE 3-2

ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 4 OF 8

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | SG-20 SWSG20-01 10/27/99 | SG-20 SWSG20-02 01/23/00 | SG-20 SWSG20-03 04/04/00 | SG-20 SWSG20-03-D 04/04/00 | SG-20 SWSG20-04 07/19/00 |
|--|---|--------------------------------|--------------------------|--------------------------|--------------------------|----------------------------|--------------------------|
| VOCs (ug/L) | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | | 1 U | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | | 1 U | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | | 1 U | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.15 U | | 0.15 U | 0.15 U | 0.2 UJ |
| BENZO(A)PYRENE | 0.3 | NA | 0.15 U | | 0.15 U | 0.15 U | 0.2 UJ |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.15 U | | 0.15 U | 0.15 U | 0.2 UJ |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.15 U | | 0.15 U | 0.15 U | 0.2 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | | 2 U | 2 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1 U | | 1 U | 1 U | 0.2 UJ |
| Pesticides/PCBs (ug/L) | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | 0.02 U | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | 0.01 U | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | | 2.6 U/2.6 U | 2.6 U/2.6 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | 0.2 U/0.2 U | 0.2 U/0.2 U | 0.2 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.3 U/0.3 U | | 0.3 U/0.3 U | 0.3 U/0.3 U | 0.34 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | | 2.2 U/1 U | 1 U/1 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.2 U | | 2.9 U/1.3 U | 2.9 U/1.4 U | 1.6 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | | 1.8 U/1.8 U | 1.8 U/1.8 U | 2.3 J/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 13.1 J/47.3 J | | 16.3/16.9 | 16/19.2 | 11.3 J/24.4 |
| Miscellaneous Parameters (mg/L) | | | | | | | |
| ALKALINITY | NA | NA | 49.2 | | 24 | 33.2 | 40.1 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 23.8 | | 20 U | 20 U | 38 |
| CHLORIDE | NA | NA | 161 | | 87.2 J | 87.9 J | 82.9 J |
| HARDNESS | NA | NA | 95.7 | | 51.9 | 52 | 56 |
| SULFATE | NA | NA | 14.5 | | 20.8 | 20.9 | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 296 | | 211 | 224 | 212 J |
| TOTAL ORGANIC CARBON | NA | NA | 6.3 | | 4.5 | 3.3 | 6.1 |

TABLE 3-2

ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 5 OF 8

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | SG-21 SWSG21-01 10/24/99 | SG-21 SWSG21-01-D 10/24/99 | SG-21 SWSG21-02 01/23/00 | SG-21 SWSG21-03 04/04/00 | SG-21 SWSG21-04 07/19/00 |
|--|---|--------------------------------|--------------------------|----------------------------|--------------------------|--------------------------|--------------------------|
| VOCs (ug/L) | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | 1 U | | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | 1 U | | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | 1 U | | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.15 U | 0.16 U | | 0.15 U | 0.21 UJ |
| BENZO(A)PYRENE | 0.3 | NA | 0.15 U | 0.16 U | | 0.15 U | 0.21 UJ |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.15 U | 0.16 U | | 0.15 U | 0.21 UJ |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.15 U | 0.16 U | | 0.15 U | 0.21 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | 2 U | | 2 U | 2.1 U |
| PHENANTHRENE | 0.077 | NA | 1 U | 1.1 U | | 1 U | 0.21 UJ |
| Pesticides/PCBs (ug/L) | | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | 0.2 U | | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | 0.02 U | | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | 0.01 U | | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 3.8 U/3.8 U | 3.8 U/3.8 U | | 2.6 U/2.6 U | 2.7 U/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | 0.2 U/0.2 U | | 0.2 U/0.2 U | 0.1 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.42/0.3 U | 0.31/0.3 U | | 0.3 U/0.3 U | 0.32 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | 2.4 U/2.4 U | | 1 U/1 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.2 U/1.7 U | 2.3 U/1.8 U | | 2.5 U/1.3 U | 0.87 U/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 1.7 U/1.7 U | 1.7 U/1.7 U | | 2.6 U/1.8 U | 1.9 U/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 26.2 U/24.8 U | 59.2/110 | | 15.2/21.9 | 18.3 J/13.9 |
| Miscellaneous Parameters (mg/L) | | | | | | | |
| ALKALINITY | NA | NA | 80.2 | 70.4 | | 34.9 | 95.6 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 21.1 | 20 U | | 20 U | 50.6 |
| CHLORIDE | NA | NA | 116 | 129 | | 89 J | 113 J |
| HARDNESS | NA | NA | 125 | 86.5 | | 54.4 | 110 |
| SULFATE | NA | NA | 12.1 | 12.5 | | 20.5 | 20 U |
| TOTAL DISSOLVED SOLIDS | NA | NA | 315 | 326 | | 193 | 356 J |
| TOTAL ORGANIC CARBON | NA | NA | 5.4 | 5.6 | | 4.5 | 11.7 |

TABLE 3-2

ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 6 OF 8

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | SG-22 SWSG22-01 10/27/99 | SG-22 SWSG22-02 01/23/00 | SG-22 SWSG22-03 04/05/00 | SG-22 SWSG22-04 07/19/00 |
|--|---|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | | 1 U | |
| ETHYLBENZENE | 580,000 | NA | 1 U | | 1 U | |
| XYLENES, TOTAL | NA | NA | 1 U | | 1 U | |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.15 U | | 0.15 U | |
| BENZO(A)PYRENE | 0.3 | NA | 0.15 U | | 0.15 U | |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.15 U | | 0.15 U | |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.15 U | | 0.15 U | |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 UJ | | 2 U | |
| PHENANTHRENE | 0.077 | NA | 1 U | | 1 U | |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | 0.02 U | |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | 0.01 U | |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 4.5 J/3.8 U | | 2.6 U/2.6 U | |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | 0.2 U/0.2 U | |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.31 U/0.3 U | | 0.32 U/0.3 U | |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 38.4 J/2.4 U | | 1.3 U/1 U | |
| COPPER | 48 | 4.8 ⁽³⁾ | 10.8/1.2 U | | 6.5 U/2.8 U | |
| LEAD | 13 | 1.2 ⁽³⁾ | 6.6 U/2.1 U | | 4.8 U/1.8 U | |
| ZINC | 123 | 58.2 ⁽³⁾ | 90.2 J/37 J | | 14.6/10.2 | |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 134 | | 74 | |
| CHEMICAL OXYGEN DEMAND | NA | NA | 42.2 | | 31.4 | |
| CHLORIDE | NA | NA | 64.2 | | 53.4 J | |
| HARDNESS | NA | NA | 140 | | 70.6 | |
| SULFATE | NA | NA | 10 U | | 20 U | |
| TOTAL DISSOLVED SOLIDS | NA | NA | 268 | | 179 | |
| TOTAL ORGANIC CARBON | NA | NA | 9 | | 6.2 | |

TABLE 3-2

**ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 7 OF 8**

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | SG-23 SWSG23-01 10/27/99 | SG-23 SWSG23-02 01/23/00 | SG-23 SWSG23-03 04/05/00 | SG-23 SWSG23-04 07/19/00 |
|--|---|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | | 1 U | 1 U |
| ETHYLBENZENE | 580,000 | NA | 1 U | | 1 U | 1 U |
| XYLENES, TOTAL | NA | NA | 1 U | | 1 U | 1 U |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BENZO(A)PYRENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.16 U | | 0.15 U | 0.2 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | | 2.1 U | 2 U |
| PHENANTHRENE | 0.077 | NA | 1 U | | 1 U | 0.2 UJ |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | 0.2 U |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | 0.02 U | 0.02 U |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | 0.01 U | 0.01 U |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 8.2 J/5.6 J | | 2.6 U/2.6 U | 3 J/2.7 U |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | 0.2 U/0.2 U | 0.11 U/0.1 U |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.33 U/0.34 U | | 0.3 U/0.3 U | 0.48 U/0.32 U |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 2.4 U/2.4 U | | 1 U/1 U | 1.3 U/1.3 U |
| COPPER | 48 | 4.8 ⁽³⁾ | 1.7 U/1.2 U | | 4 U/1.5 U | 6.2/0.87 U |
| LEAD | 13 | 1.2 ⁽³⁾ | 3.2 U/4.6 U | | 1.8 U/1.8 U | 5 J/1.9 U |
| ZINC | 123 | 58.2 ⁽³⁾ | 119 J/96.5 J | | 27.9/24 | 65.2 J/6.4 |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 99.4 | | 78.4 | 35.9 |
| CHEMICAL OXYGEN DEMAND | NA | NA | 58.1 | | 20 U | 101 |
| CHLORIDE | NA | NA | 89.1 | | 89.2 J | 71.9 J |
| HARDNESS | NA | NA | 172 | | 68.2 | 78 |
| SULFATE | NA | NA | 10 U | | 20 U | 45.5 |
| TOTAL DISSOLVED SOLIDS | NA | NA | 267 | | 280 | 256 J |
| TOTAL ORGANIC CARBON | NA | NA | 10.3 | | 3.3 | 8.9 |

TABLE 3-2

**ROUNDS 1 THROUGH 4 SURFACE WATER ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT
PAGE 8 OF 8**

| Chemical | Primary Monitoring Criterion ⁽¹⁾ | Secondary Monitoring Criterion | SG-24 SWSG24-01 10/27/99 | SG-24 SWSG24-02 01/23/00 | SG-24 SWSG24-03 04/05/00 | SG-24 SWSG24-04 07/19/00 |
|--|---|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| VOCs (ug/L) | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | 110 | NA | 1 U | | 1 U | |
| ETHYLBENZENE | 580,000 | NA | 1 U | | 1 U | |
| XYLENES, TOTAL | NA | NA | 1 U | | 1 U | |
| SVOCs (ug/L) | | | | | | |
| BENZO(A)ANTHRACENE | 0.3 | NA | 0.15 U | | 0.16 U | |
| BENZO(A)PYRENE | 0.3 | NA | 0.15 U | | 0.16 U | |
| BENZO(B)FLUORANTHENE | 0.3 | NA | 0.15 U | | 0.16 U | |
| BENZO(K)FLUORANTHENE | 0.3 | NA | 0.15 U | | 0.16 U | |
| BIS(2-ETHYLHEXYL)PHTHALATE | 59 | NA | 2 U | | 2 U | |
| PHENANTHRENE | 0.077 | NA | 1 U | | 1 U | |
| Pesticides/PCBs (ug/L) | | | | | | |
| AROCLOR-1016 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | |
| AROCLOR-1254 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | |
| AROCLOR-1260 | 0.5 | 0.014 ⁽²⁾ | 0.2 U | | 0.2 U | |
| DIELDRIN | 0.1 | 0.0019 ⁽³⁾ | 0.02 U | | 0.02 U | |
| HEPTACHLOR | 0.05 | 0.0038 ⁽²⁾ | 0.01 U | | 0.01 U | |
| Inorganics (total/dissolved) (ug/L) | | | | | | |
| ARSENIC | 4 | 150 ⁽²⁾ | 4.2 J/3.8 U | | 3.7 J/2.6 U | |
| BERYLLIUM | 4 | NA | 0.2 U/0.2 U | | 0.2 U/0.2 U | |
| CADMIUM | 6 | 0.62 ⁽³⁾ | 0.31 U/0.3 U | | 0.3 U/0.3 U | |
| CHROMIUM ⁽⁴⁾ | 110 | 11 ⁽²⁾ | 4.3 J/2.4 U | | 1 U/1.5 U | |
| COPPER | 48 | 4.8 ⁽³⁾ | 17/11.4 | | 7.2 U/2 U | |
| LEAD | 13 | 1.2 ⁽³⁾ | 3.2 U/2.9 U | | 2.5 U/1.8 U | |
| ZINC | 123 | 58.2 ⁽³⁾ | 48.3 J/70.7 J | | 20.8/28.4 | |
| Miscellaneous Parameters (mg/L) | | | | | | |
| ALKALINITY | NA | NA | 24.3 | | 40.3 | |
| CHEMICAL OXYGEN DEMAND | NA | NA | 55.4 | | 21 | |
| CHLORIDE | NA | NA | 78 | | 398 J | |
| HARDNESS | NA | NA | 115 | | 131 | |
| SULFATE | NA | NA | 10 U | | 20 U | |
| TOTAL DISSOLVED SOLIDS | NA | NA | 201 | | 643 | |
| TOTAL ORGANIC CARBON | NA | NA | 14.2 | | 9.2 | |

NOTES:

Bold numbers denote exceedance of primary or secondary monitoring criterion.

- 1 Surface Water Protection Criteria for substances in groundwater (CTDEP, January 1996).
 - 2 Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, freshwater) (USEPA, 1999a).
 - 3 Connecticut Water Quality Criteria for protection of human health from consumption of organisms (CTDEP, 1997).
 - 4 Hexavalent chromium
- J Estimated value
R Rejected value
U Undetected
NA Not available

TABLE 3-3

**CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
SITE 2 – AREA A LANDFILL
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
PAGE 1 OF 2**

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|---|---|--|--|
| FEDERAL | | | |
| EPA Human Health Assessment Cancer Slope Factors (CSFs) | | CSFs are guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants. | The selected remedy prevents exposure to contaminated media and thereby minimizes human health concerns, although any changes to the cap in the future could allow exposure. |
| EPA Reference Dose (RfDs) | | RfDs are guidance values use to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants. | The selected remedy prevents exposure to contaminated media and thereby minimizes human health concerns, although any changes to the cap in the future could allow exposure. |
| STATE OF CONNECTICUT | | | |
| Cleanup Standard Regulations | CGS §22a-133k (Updated to RCSA Section 22a-133k-1 through 3) | These regulations provide specific numeric cleanup criteria for a wide variety of contaminants in soil and groundwater. Separate criteria are established for threats to human health and environmental receptors posed by direct contact with contaminants. | These were replaced by the CTDEP RSRs. The selected remedy complies with these standards because of employment of the engineered control. Changes in action levels for groundwater are addressed on Table 3-6. |
| Water Pollution Control | RCSA § 22a-430-1 through 8 | These rules establish permitting requirements and criteria for water discharge to surface water. | This regulation was addressed during construction. Now that the cap construction has been completed, this requirement is no longer applicable. |

TABLE 3-3

CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
 SITE 2 – AREA A LANDFILL
 NAVAL SUBMARINE BASE NEW LONDON
 GROTON, CONNECTICUT
 PAGE 2 OF 2

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|---|-------------|--|---|
| STATE OF CONNECTICUT (Continued) | | | |
| Water Quality Standards | CGS 22a-426 | Connecticut's Water Quality Standards establish specific numeric criteria, designated uses, and anti-degradation policies for groundwater and surface water. | Standards are being used to evaluate monitoring results to determine if further remedial action is required to protect resources. Remedial activities were undertaken in a manner that was consistent with the antidegradation policy in the Water Quality. Changes in groundwater quality criteria are addressed in Table 3-6. |

TABLE 3-4

LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
 SITE 2 – AREA A LANDFILL
 NAVAL SUBMARINE BASE NEW LONDON
 GROTON, CONNECTICUT

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|---|--|---|--|
| FEDERAL | | | |
| Executive Order on Protection of Wetlands | E. O. 11990, 40 CFR Part 6, App. A | Requires federal agencies to avoid impacts associated with the destruction or loss of wetlands, minimize potential harm, preserve and enhance wetlands, and avoid support of new construction in wetlands if a practicable alternative exists. | The cap was designed to minimize impacts to the adjacent wetlands. Now that the cap construction has been completed, this requirement is no longer applicable. |
| Clean Water Act §404 – Dredge and Fill Activities | 40 CFR Parts 230; 33 CFR Parts 320-328 | Requires that for dredging or filling of wetlands: no practicable alternatives exist, the activity will not cause a violation of state water quality standards or significant degradation of the water, and adverse effects will be minimized. | The landfill cap was designed to meet these standards and minimize the impacts to adjacent wetlands. Now that the cap construction has been completed, this requirement is no longer applicable. |
| STATE OF CONNECTICUT | | | |
| Inland Wetlands and Watercourses Regulations | RCSA §§22a-39-1 through 15 | Regulates any operation within or use of a wetland or watercourse involving removal or deposition of material, or any obstruction, construction, alteration, or pollution of such wetland or watercourse. | The landfill cap was designed to meet these standards and minimize the impacts to adjacent wetlands. Now that the cap construction has been completed, this requirement is no longer applicable. |
| Inland Wetlands and Watercourses Regulations | CGS §§22a-45a | Governs minor activities including installation of water quality monitoring equipment such as water quality testing devices, and survey activities including test pits and core sampling. The Department was drafting these requirements during preparation of the FFS. | This regulation was addressed during construction. Now that the cap construction has been completed, this requirement is no longer applicable. |

TABLE 3-5

**ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
SITE 2 – AREA A LANDFILL
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
PAGE 1 OF 5**

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|---|---------------------------|---|---|
| FEDERAL | | | |
| RCRA – General Requirements | 40 CFR Part 264 Subpart A | Established general requirements for owners and operators of hazardous waste treatment, storage, and disposal facilities. | The cap and associated systems were designed to meet these requirements. Now that the cap construction has been completed, this requirement is no longer applicable. |
| RCRA – Preparedness and Prevention | 40 CFR Part 264 Subpart C | Established requirements for minimizing the possibility of fire, explosion, or release of hazardous material. | The cap and associated systems were designed and remedial action was carried out to meet these requirements. Now that the cap construction has been completed, this requirement is no longer applicable. |
| RCRA – Contingency Plan and Emergency Procedures | 40 CFR Part 264 Subpart D | Established contingency plan requirements on the event of fire, explosion, or release from a facility. | This regulation was addressed during construction. Now that the cap construction has been completed, this requirement is no longer applicable. |
| RCRA – Releases from Solid Waste Management Units | 40 CFR Part 264 Subpart F | Regulates releases from Solid Waste Management Units (SWMUs). | <p>This regulation was addressed during construction. Now that the cap construction has been completed, possible releases are being addressed by groundwater monitoring. Current Section 264.99 specifies a sequence of at least four samples from each well collected at least semi-annually during the compliance period, and current Section 264.96 specifies a compliance period of demonstrating groundwater protection for a period of three consecutive years beyond closure.</p> <p>Groundwater and surface water sampling have been performed during the four quarterly rounds of the first year. The monitoring schedule for subsequent sampling will be based on the analytical results and subsequent regulatory input and review. To meet the regulations, groundwater must show continued compliance for an additional two years. Changes in relevant Federal water chemical criteria are presented on Table 3-6.</p> |
| RCRA – Closure and Post-Closure Requirements | 40 CFR Part 264 Subpart G | Establishes general requirements for closure and post-closure of hazardous waste landfills. | The cap and associated systems were designed to meet these requirements. Post-closure groundwater monitoring is addressed under Subpart F. |

TABLE 3-5

**ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
SITE 2 – AREA A LANDFILL
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
PAGE 2 OF 5**

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|---|--|--|--|
| FEDERAL (Continued) | | | |
| Federal Clean Air Act – National Emission Standard for Hazardous Air Pollutants (“NESHAPS”) | 40 CFR Part 61 | Establishes emission levels for eight listed hazardous air pollutants emitted from particular types of facilities. | This act was considered during the selection of the remedy. The selected remedy included passive gas management but no sampling; therefore this requirement is no longer applicable. |
| Federal Clean Air Act – Non-methane Organic Compounds (“NMOCs”) | Proposed Rule – 56 FR 24468, to be codified at 40 CFR Part 60 Subpart WWW. | Regulations would require specific gas collection and control systems, monitoring, and gas generation estimates. The proposed rule would establish a performance standard for NMOC emissions from municipal and solid waste landfills. | This act was considered during the selection of the remedy. The selected remedy included passive gas management but no sampling; therefore this requirement is no longer applicable. |
| Clean Water Act, Section 402, National Pollution Discharge Elimination System (NPDES) | 40 CFR 122 through 125, 131 | NPDES (National Pollution Discharge Elimination System) permits are required for any discharges to navigable waters. If remedial activities include such a discharge, the NPDES standards would be ARARs. | This regulation was addressed during construction. Now that the cap construction has been completed, this requirement is no longer applicable. |
| PCB Regulation under TSCA | 40 Part CFR 761 | These standards govern the storage of PCB items. | PCB contamination was addressed by capping the site, although any changes to the cap in the future would require revisiting this issue. |

TABLE 3-5

**ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
SITE 2 – AREA A LANDFILL
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
PAGE 3 OF 5**

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|---|---------------------------|--|--|
| FEDERAL (Continued) | | | |
| EPA Technical Guidance – Final Covers on Hazardous Waste Landfills and Surface Impoundments | EPA/530-SW-89-047 | Presents technical specifications for the design of multi-layer covers at landfills where hazardous wastes were disposed. | The cap and associated systems were designed to meet these requirements. Now that the cap construction has been completed, this requirement is no longer applicable. |
| STATE OF CONNECTICUT | | | |
| Hazardous Waste Management: Generator and Handler Requirements | RCSA § 22a-449(c) 100-101 | These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR 260-261 are incorporated by reference. | This regulation was addressed during construction. Now that the cap construction has been completed, this requirement is no longer applicable. |
| Hazardous Waste Management: Generator Standards | RCSA § 22a-449(c)-102 | This section establishes standards for various classes of generators. The standards of 40 CFR 262 are incorporated by reference. Storage requirements given at 40 CFR 265.15 are also included. | Any hazardous wastes generated during the remedial action were managed in accordance with the substantive requirements of these regulations. Now that the cap construction has been completed, this requirement is no longer applicable. |
| Hazardous Waste Management: TSDF Standards | RCSA § 22a-449(c)-104 | This section establishes standards for treatment, storage, and disposal of hazardous waste, and establishes standards for closure, post-closure, and groundwater monitoring. The standards of 40 CFR Part 364 are incorporated by reference. | The remedial action does not include any on-site treatment, storage, or disposal of hazardous waste. The proposed cap design complied with the closure requirements of this regulation. The remedial action includes groundwater monitoring. This regulation was last amended in 1994; therefore compliance to this regulation is current. |

TABLE 3-5

**ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
SITE 2 – AREA A LANDFILL
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
PAGE 4 OF 5**

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|--|------------------------|---|---|
| STATE OF CONNECTICUT (Continued) | | | |
| Hazardous Waste Management: Interim Status Facilities and Groundwater Monitoring Requirements, Closure and Post-Closure Requirements | RCSA §§ 22a-449(c)-105 | This section establishes interim status standards for treatment, storage, and disposal of hazardous waste, and establishes standards for closure, post-closure, and groundwater monitoring. The standards of 40 CFR Part 364 are incorporated by reference. | The proposed cap design complied with the closure requirements of this regulation. The remedial action includes groundwater monitoring. This regulation was last amended in 1994; therefore compliance to this regulation is current. |
| Solid Waste Management | RCSA 22a-209-1 to 15 | Establishes standards for closure of solid waste disposal areas | Those portions of the regulations that are more stringent than Federal RCRA Subtitle D regulations were met. This regulation was last amended in 1996; therefore compliance to this regulation is current. |
| Transportation of Oil and Chemical Liquids | RCSA 29-337-1 to 3 | These rules govern the transportation of hazardous materials, including flammable liquids and other chemicals. | This regulation was addressed during construction. Now that the cap construction has been completed, this requirement is no longer applicable. |
| Control of Noise | RCSA 22a-69-1 to 7.4 | These regulations establish allowable noise levels. | This regulation was addressed during construction. Now that the cap construction has been completed, this requirement is no longer applicable. |

TABLE 3-5

**ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE
SITE 2 – AREA A LANDFILL
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
PAGE 5 OF 5**

| Requirement | Citation | Requirement Synopsis | Current Status / Applicability |
|---|-----------------------------|---|---|
| STATE OF CONNECTICUT (Continued) | | | |
| Air Pollution Control – Organic Compound Emissions, Odors, Hazardous Air Pollutants, Particulate Emissions, Stationary Sources, Sulfur Compound Emissions | RCSA § 22a-174-1 through 29 | These regulations require permits to construct and to operate specified types of emission sources and contain emission standards that must be met prior to issuance of a permit. Pollutant abatement controls may be required. Specific standards pertain to fugitive dust (18b) and control of odors (23). | The remedial action activities were implemented following the requirements of this regulation. The selected remedy included passive gas management but no sampling; therefore this requirement is no longer applicable. |

TABLE 3-6

COMPARISON OF SECONDARY MONITORING CRITERIA
NSB-NLON, GROTON, CONNECTICUT

| Chemical | Federal AWQCs ⁽¹⁾ | | CTDEP WQSS ⁽²⁾ | |
|--|------------------------------|--------------|---------------------------|-------------|
| | July, 1995 | April, 1999 | April 1996 | April 1997 |
| VOCs (ug/L) | | | | |
| 1,1,2,2-TETRACHLOROETHANE | NA | NA | NA | NA |
| ETHYLBENZENE | NA | NA | NA | NA |
| XYLENES, TOTAL | NA | NA | NA | NA |
| SVOCs (ug/L) | | | | |
| BENZO(A)ANTHRACENE | NA | NA | NA | NA |
| BENZO(A)PYRENE | NA | NA | NA | NA |
| BENZO(B)FLUORANTHENE | NA | NA | NA | NA |
| BENZO(K)FLUORANTHENE | NA | NA | NA | NA |
| BIS(2-ETHYLHEXYL)PHTHALATE | NA | NA | NA | NA |
| PHENANTHRENE | NA | NA | NA | NA |
| Pesticides/PCBs (ug/L) | | | | |
| AROCLOR-1016 | 0.014 | 0.014 | 0.014 | 0.014 |
| AROCLOR-1254 | 0.014 | 0.014 | 0.014 | 0.014 |
| AROCLOR-1260 | 0.014 | 0.014 | 0.014 | 0.014 |
| DIELDRIN | 0.0019 | 0.056 | 0.0019 | 0.0019 |
| HEPTACHLOR | 0.0038 | 0.0038 | 0.0038 | 0.0038 |
| Inorganics (total/dissolved) (ug/L) | | | | |
| ARSENIC | 190 | 150 | 190 | 190 |
| BERYLLIUM | NA | NA | NA | NA |
| CADMIUM | 1 | 2.2 | 0.62 | 0.62 |
| CHROMIUM ⁽³⁾ | 10 | 11 | 10 | 10 |
| COPPER | 11 | 9 | 4.8 | 4.8 |
| LEAD | 2.5 | 2.5 | 1.3 | 1.2 |
| ZINC | 100 | 120 | 12.3 | 58.2 |

Notes:

1 - USEPA National Recommend Water Quality Criteria.

2 - Connecticut Water Quality Standards

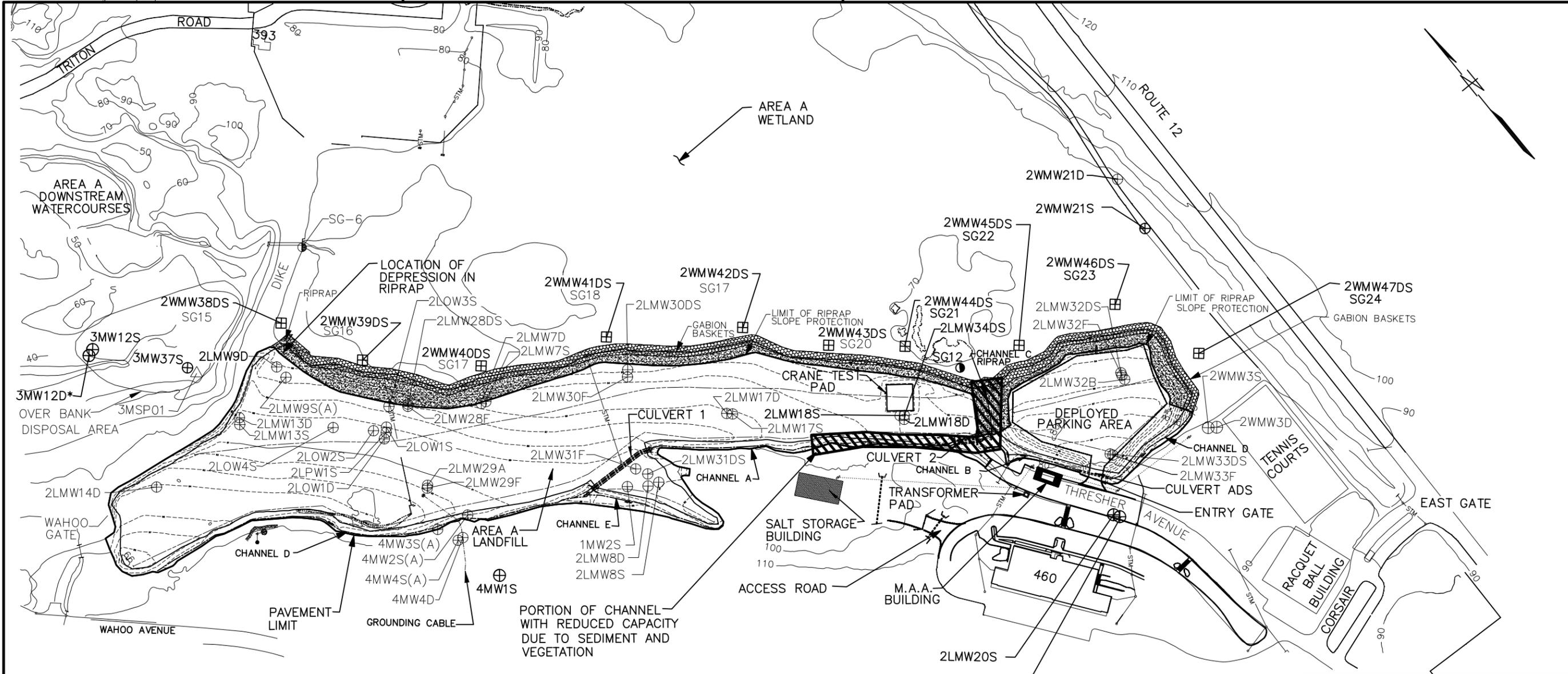
3 - Hexavalent chromium

Shading indicates criteria that has changed.

TABLE 3-7

AREA A LANDFILL DEFICIENCIES
NSB-NLON, GROTON, CONNECTICUT

| Deficiency | Effects Protectiveness | |
|--|------------------------|--------|
| | Current | Future |
| O&M of cap system (vegetation, sediment, and asphalt cracks) | N | Y |
| Improper storage of heavy equipment on cap | N | Y |
| Maintenance/abandonment of monitoring wells | N | Y |
| Depression in rip rap along toe of the landfill | N | Y |

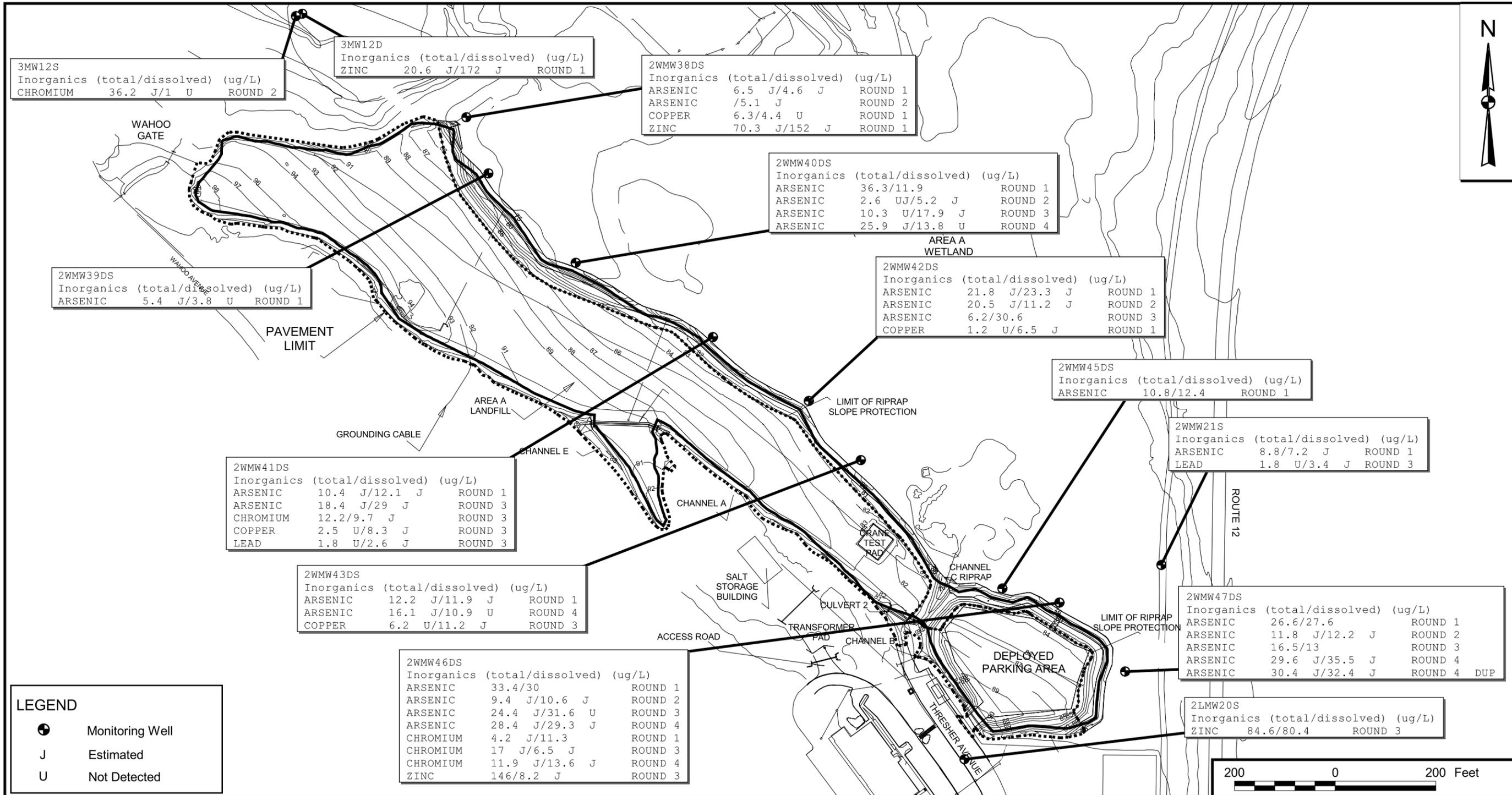


NOTE
 1. BASE MAP AND UTILITY INFORMATION FROM MAPS OF NSB-NLON AND PHASE II RI WORK PLAN (ATLANTIC, MAY 1993).



| LEGEND | |
|--------|---------------------------------|
| ⊕ | MONITORING WELL |
| ● | STAFF GAUGE |
| ⊞ | MONITORING WELL AND STAFF GAUGE |
| △ | SEEP LOCATION |
| (A) | ABANDONED |

| NO. | DATE | REVISIONS | BY | CHKD | APPD | REFERENCES | DRAWN BY HJP | DATE 12/19/00 | Tetra Tech NUS, Inc. SITE 2 - AREA A LANDFILL AND WETLAND NSB-NLON GROTON, CONNECTICUT | CONTRACT NO. 2863 | OWNER NO. 0816 |
|-----|------|-----------|----|------|------|------------|-------------------|------------------|---|----------------------|-------------------|
| | | | | | | | CHECKED BY | DATE | | APPROVED BY | DATE |
| | | | | | | | COST/SCHED-AREA | | | APPROVED BY | DATE |
| | | | | | | | SCALE AS NOTED | | | DRAWING NO. | FIGURE 3-1 |



3MW12S
Inorganics (total/dissolved) (ug/L)
CHROMIUM 36.2 J/1 U ROUND 2

3MW12D
Inorganics (total/dissolved) (ug/L)
ZINC 20.6 J/172 J ROUND 1

2WMW38DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 6.5 J/4.6 J ROUND 1
ARSENIC /5.1 J ROUND 2
COPPER 6.3/4.4 U ROUND 1
ZINC 70.3 J/152 J ROUND 1

2WMW40DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 36.3/11.9 ROUND 1
ARSENIC 2.6 UJ/5.2 J ROUND 2
ARSENIC 10.3 U/17.9 J ROUND 3
ARSENIC 25.9 J/13.8 U ROUND 4

2WMW39DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 5.4 J/3.8 U ROUND 1

2WMW42DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 21.8 J/23.3 J ROUND 1
ARSENIC 20.5 J/11.2 J ROUND 2
ARSENIC 6.2/30.6 ROUND 3
COPPER 1.2 U/6.5 J ROUND 1

2WMW45DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 10.8/12.4 ROUND 1

2WMW21S
Inorganics (total/dissolved) (ug/L)
ARSENIC 8.8/7.2 J ROUND 1
LEAD 1.8 U/3.4 J ROUND 3

2WMW41DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 10.4 J/12.1 J ROUND 1
ARSENIC 18.4 J/29 J ROUND 3
CHROMIUM 12.2/9.7 J ROUND 3
COPPER 2.5 U/8.3 J ROUND 3
LEAD 1.8 U/2.6 J ROUND 3

2WMW43DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 12.2 J/11.9 J ROUND 1
ARSENIC 16.1 J/10.9 U ROUND 4
COPPER 6.2 U/11.2 J ROUND 3

2WMW47DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 26.6/27.6 ROUND 1
ARSENIC 11.8 J/12.2 J ROUND 2
ARSENIC 16.5/13 ROUND 3
ARSENIC 29.6 J/35.5 J ROUND 4
ARSENIC 30.4 J/32.4 J ROUND 4 DUP

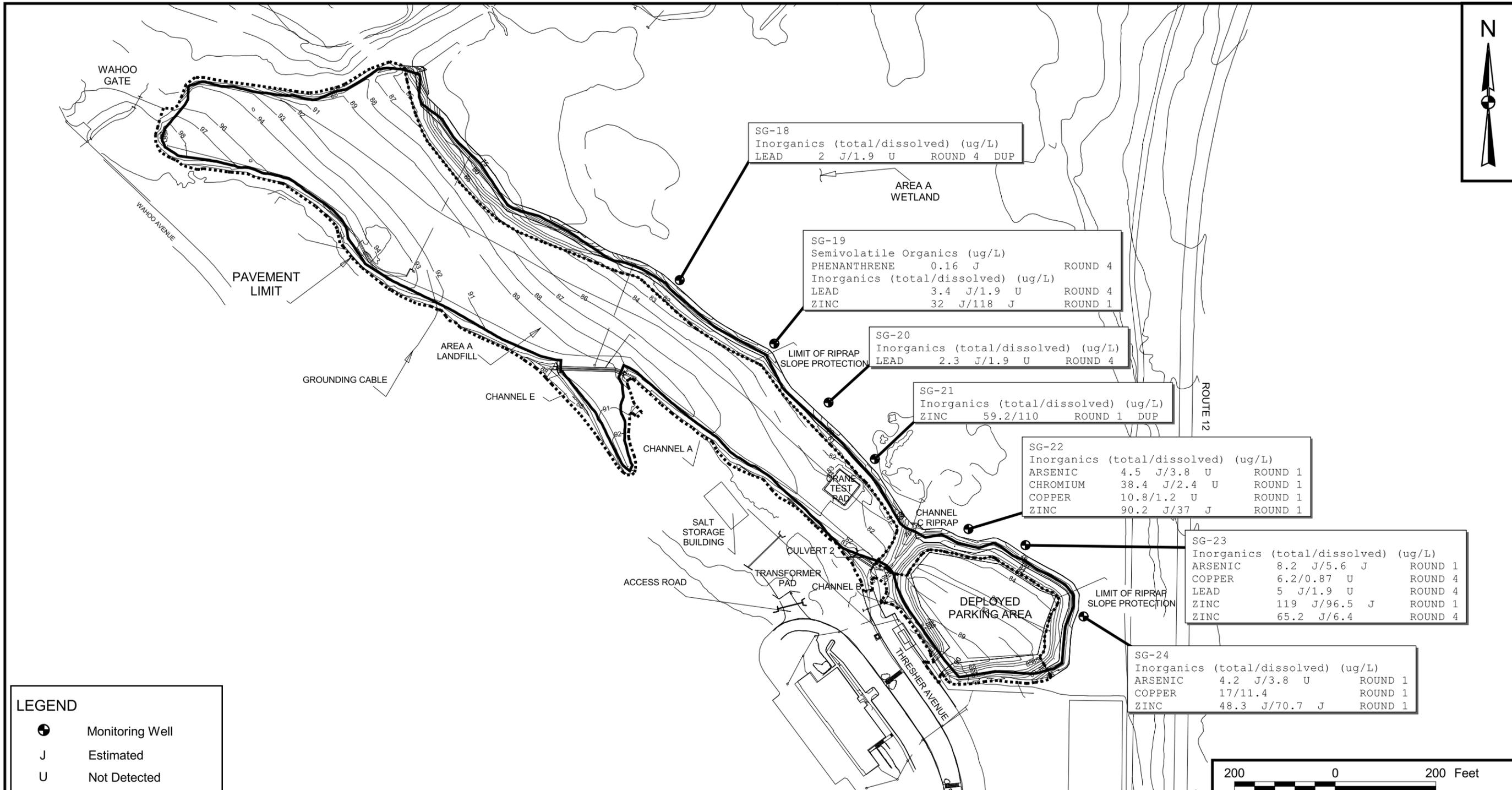
2WMW46DS
Inorganics (total/dissolved) (ug/L)
ARSENIC 33.4/30 ROUND 1
ARSENIC 9.4 J/10.6 J ROUND 2
ARSENIC 24.4 J/31.6 U ROUND 3
ARSENIC 28.4 J/29.3 J ROUND 4
CHROMIUM 4.2 J/11.3 ROUND 1
CHROMIUM 17 J/6.5 J ROUND 3
CHROMIUM 11.9 J/13.6 J ROUND 4
ZINC 146/8.2 J ROUND 3

2LMW20S
Inorganics (total/dissolved) (ug/L)
ZINC 84.6/80.4 ROUND 3

LEGEND
● Monitoring Well
J Estimated
U Not Detected



| NO. | DATE | REVISIONS | BY | CHKD | APPD | REFERENCES | DRAWN BY | DATE | Tetra Tech NUS, Inc. EXCEEDENCES OF MONITORING CRITERIA IN GROUNDWATER ROUNDS 1 THROUGH 4 AREA A LANDFILL NSB-NLON, GROTON, CONNECTICUT | CONTRACT NUMBER | OWNER NUMBER |
|-----|------|-----------|----|------|------|------------|----------------|---------|--|-----------------|--------------|
| | | | | | | | M. Spangenberg | 1-9-01 | | 2863 | 0816 |
| | | | | | | | KMS | 5-30-01 | | APPROVED BY | DATE |
| | | | | | | | | | | MLM | 2-6-01 |
| | | | | | | | | | APPROVED BY | DATE | |
| | | | | | | | | | | | |
| | | | | | | | | | DRAWING NO. | REV | |
| | | | | | | | | | FIGURE 3-2 | 0 | |



| LEGEND | |
|--------|-----------------|
| | Monitoring Well |
| J | Estimated |
| U | Not Detected |



| NO. | DATE | REVISIONS | BY | CHKD | APPD | REFERENCES | DRAWN BY | DATE | Tetra Tech NUS, Inc. EXCEEDENCES OF MONITORING CRITERIA IN SURFACE WATER ROUNDS 1 THROUGH 4 AREA A LANDFILL NSB-NLON, GROTON, CONNECTICUT | CONTRACT NUMBER | OWNER NUMBER |
|-----|------|-----------|----|------|------|------------|--------------------|---------|---|-----------------|--------------|
| | | | | | | | M. Spangenberg | 1-9-01 | | 2863 | 0816 |
| | | | | | | | CHECKED BY | DATE | | APPROVED BY | DATE |
| | | | | | | | KMS | 5-30-01 | | MLM | 2-6-01 |
| | | | | | | | COST/SCHEDULE-AREA | | APPROVED BY | DATE | |
| | | | | | | | SCALE | | DRAWING NO. | | REV |
| | | | | | | | AS NOTED | | FIGURE 3-3 | | 0 |