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BEACON HEIGHTS LANDFILL SUPERFUND SITE



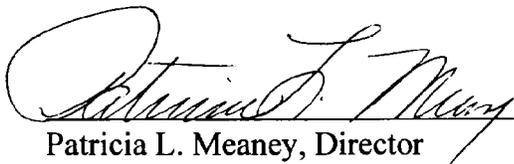
Second Five Year Review

September 1998

Second Five Year Review

Beacon Heights Landfill Superfund Site Beacon Falls, Connecticut

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Region I – EPA New England



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Date

1.0 INTRODUCTION

1.1 Statutory Requirements

As requested by the Environmental Protection Agency (EPA), a second five-year review was conducted of the remedial actions selected for the Beacon Heights Landfill, in Beacon Falls, Connecticut. The first five-year review was completed in December 1992. In accordance with Section 121 (c) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended, and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), reviews are mandated for all remedial actions that result in any hazardous substances remaining at a site. Reviews are to be conducted at least every five years after the initiation of the remedial action to assure that human health and the environment are being protected by the implemented remedial action.

The EPA has established a three-tier approach to conducting five-year reviews, the most basic of which provides a minimum protectiveness evaluation (Level I Review). The second and third levels of review (Levels II and III) are intended to provide the flexibility to respond to varying site-specific considerations and employ further analysis of the site conditions. In all but a relatively few cases where site-specific circumstances suggest a more comprehensive level of review, the EPA has determined that a Level I review will be appropriate. A Level I review was required at the Beacon Heights Landfill Site to confirm that the remedial action, as presented in the 1985 Record of Decision (ROD) and the 1990 Supplemental ROD (sROD), adequately protects the public health and the environment.

1.2 Scope of the Five Year Review

Specific tasks performed as part of this five-year review included:

- *Document Review:*
Applicable site-related documents were reviewed to obtain familiarity with the site history, remedial actions conducted since the last five-year review, and general Site status. The following documents or files were examined:
 - ✓ Record of Decision, Beacon Heights Landfill, Beacon Falls, Connecticut, September 23, 1985.
 - ✓ Remedial Action Plan (Appendix A of the “Consent Decree relating to the Beacon Heights Landfill Site”, entered on or after June 26, 1987).
 - ✓ Beacon Heights Landfill, Supplemental Record of Decision, Beacon Heights Site, Town of Beacon Falls, New Haven County, Connecticut, EPA Region I, September 28, 1990.

- ✓ 100% Design Report for the Remedial Design, Beacon Heights Landfill Superfund Site, Beacon Falls, Connecticut, prepared by Bechtel Environmental, Inc., dated January 1992.
- ✓ Beacon Heights Site Five-Year Review, Beacon Falls, Connecticut, prepared by Roy F. Weston, Inc., dated December 14, 1992.
- ✓ Groundwater, Surface Water, Sediment and Seep Monitoring Plan, Beacon Heights NPL Site, prepared by GeoSyntec Consultants, dated September 1996.
- ✓ Remedial Action Report, Revision 1, and Appendices, Beacon Heights NPL Closure, prepared by GeoSyntec Consultants, dated June 1997.
- ✓ Post-Closure Operation and Maintenance Plan, Beacon Heights NPL Site, prepared by GeoSyntec Consultants, dated July 1997.
- ✓ Identification and Evaluation of Alternatives, Beacon Heights NPL Site, Beacon Falls, Connecticut, prepared by GeoSyntec Consultants, dated July 21, 1997.
- ✓ Final Construction Report – Leachate Flow Reduction Activities, Beacon Heights Site, prepared by Conestoga-Rovers & Associates (CRA), dated February 11, 1998.
- ✓ 1997 Annual Monitoring Report for the Beacon Heights Landfill, prepared by CRA, dated May 1998.
- *Standards/ARARs Review:*

Federal criteria, advisories, and guidance and State standards for soils, groundwater and surface water, and air were considered in the development of the ROD and sROD for the Site. For this five-year review, the most recently promulgated soil, groundwater and surface water standards were reviewed with respect to the site-related contaminants of concern, and compared to the standards in effect at the time of the sROD. The purpose of this review was to ensure that the selected remedy remains protective of human health and the environment by considering the changes that have occurred in the documents upon which the remedial action was based.
- *Site Visits:*

Several site visits to the Beacon Heights Landfill were conducted during the months of October, November, and December 1997 by personnel from Roy F. Weston, Inc. (WESTON) to observe the conditions of the landfill cap, the leachate collection and transportation systems, and general Site conditions.

Additional site visits to the Beacon Heights Landfill were conducted by EPA and CTDEP representatives throughout 1997 and 1998.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 Site Description

The Beacon Heights Landfill Site (the Site) is located in Beacon Falls, Connecticut, approximately ten miles south of Waterbury, Connecticut and two miles east of the intersection of Connecticut Routes 8 and 42. The actual landfill area covers approximately 34 acres of an original 82-acre property.

The area surrounding the Site is rural to suburban in character. Adjacent land uses include farming, forested areas, gravel excavation operations, and residential development. The residential development is generally limited to properties along Blackberry Hill and Skokorat Roads. One farm is near the Site, approximately 2,000 feet to the north. Low-density residential areas border the Site to the north along Blackberry Hill Road and to the west along Skokorat Road. The closest residence is north of the Site, approximately 1,000 feet from the toe of the landfill, on Blackberry Hill Road. The Site is located within the Hockanum Brook drainage area. Hockanum Brook, a tributary of the Naugatuck River, is located about 0.5 miles northwest of the Site. The brook is presently classified as recreational use water (Class C/B) with the goal of becoming a potential drinking water source (Class B/A). The Naugatuck River, located west of the Site, is classified as restricted recreational use water with the goal of becoming recreational use water.

Bedrock outcrops appear in many areas around the Site. The bedrock surface beneath the Site is fractured and slopes north/northwest, parallel to surface water drainage. Groundwater in the unconsolidated deposits also flows to the north/northwest.

2.2 Background

From the 1920's until 1970 a small portion of what is now known as the Beacon Heights Site was known as "Betkoski's Dump" and consisted of approximately 6 acres of active dumping and open burning in the northwestern corner of the existing Site. During this period of operation, there were general complaints and concerns, due to fumes, smoke, and blowing litter. The Site was not regulated by the State until 1970.

In 1970 Beacon Heights, Incorporated (BHI) purchased the Site, which included the Betkoski Dump area. BHI and its owner, Harold Murtha, owned and operated the Site as Beacon Heights Landfill and expanded the landfill area to approximately 34 acres.

From 1970 until the Site closed in July 1979 the site was used for the disposal of various waste materials. In 1977 the Connecticut Department of Environmental Protection (CTDEP) approved the spreading of wastewater sludge from the Naugatuck municipal/

industrial wastewater treatment facility over covered areas of the landfill. These activities continued until the summer of 1984.

The State's activities culminated in a Consent Order between BHI and CTDEP to close the facility by July 1, 1979. This Order was signed on June 20, 1979 and entered as a final order of the Connecticut Commissioner of Environmental Protection on July 24, 1979. BHI complied with the Consent Order and the landfill was closed in July 1979.

3.0 STANDARDS REVIEW AND UPDATE

The NCP requires that relevant federal criteria, advisories, and guidance and State standards be considered during the evaluation of potential remedial alternatives. These are referred to as Applicable, Relevant, and Appropriate Requirements (ARARs) and To-Be-Considered criteria (TBCs). The environmental laws from which ARARs and TBCs are derived, and the specific ARARs and TBCs for the selected remedial alternative for Operable Unit 2, as listed in the sROD, were comprised of:

- Safe Drinking Water Act – Maximum Contaminant Levels (SWDA)
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Occupational Safety and Health Standards (OSHA)
- OSHA Recordkeeping, Reporting and Related Regulations
- OSHA General Industry Standards
- Federal Pretreatment Requirements for Discharge to Publicly Owned Treatment Works
- Connecticut Water Discharge Permit Regulations
- Connecticut Air Pollution Control Regulations
- Connecticut Water Quality Standards and Classification
- Connecticut Public Health Code- Standards for Quality of Public Drinking Water (Sec. 19-13-B102)
- Clean Water Act – Sewage Exclusion (40 CFR Sec. 261-4(a)(1))

Table 1 presents the applicable groundwater quality criteria as listed in the 1990 sROD compared with the most recent primary maximum contaminant levels (MCLs) established by the EPA and the class GA groundwater standards established by the State of Connecticut. Note that the MCLs effective in 1998 (Column 3) for two of the contaminants differ from the 1990 Federal Exposure Criteria and Guidance (Column 2) listed in the sROD. The MCL for toluene has been reduced from 2,000 ug/L to 1,000 ug/L. The concentration criterion for Bis(2-ethylhexyl)phthalate, listed in the sROD as 3.0 ug/L, was risk-based, whereas its current MCL is 6.0 ug/L. The State of Connecticut implemented its Ground Water Quality Standards October 15, 1991, and modified them most recently in April 1996. The current Ground Water Protection Criteria for GA and

GAA Areas became effective January 30, 1996. (Note that the Site is in a GB/GA groundwater area, indicating that the State expects the groundwater quality at the Site to be improved from GB to GA.) The State's Ground Water Protection Criteria for GA areas established groundwater contaminant concentrations that are less than or equal to the currently effective MCLs (Column 3). The implementation of the State of Connecticut Statutes and Standards represents a change that may need to be considered when evaluating if the Site groundwater is suitable for unlimited and unrestricted use.

Table 2 presents the applicable soil cleanup goals, as listed in the 1990 sROD (Column 2), and the 1990 groundwater target concentrations used to calculate the soil cleanup levels (Column 3). (Note that the target concentrations are equal to the 1990 Federal Exposure Criteria and Guidance presented in Column 2 of Table 1.) The 1990 sROD Soil Cleanup Levels were calculated using the Summers Model. This model is based on the equilibrium chemistry principal of contaminant partitioning between soil and water. The model evaluated precipitation infiltration through a contaminated unsaturated zone, desorption (partitioning) of contaminants from soil to the infiltrating water (infiltrate), and mixing of the contaminated infiltrate with the groundwater. The model calculates the maximum contaminant concentration that exceeds a target groundwater concentration.

The currently effective EPA Drinking Water Standards (Column 4), were compared to the targets used to calculate the soil cleanup goals in the sROD (Column 3). As presented in the discussion of Table 1, the standards for bis(2-ethylhexyl)phthalate and toluene in the 1990 sROD differ from the 1998 standards.

Table 2 also includes the 1998 State of Connecticut Direct Exposure Criteria for Industrial/Commercial Soil (Column 5) and the Pollutant Mobility Criteria for Soil (Column 6), for comparative purposes. Because remedial action involving soil excavation and consolidation has already been completed at the Site, comparisons of the current soil cleanup concentrations with those used for the remediation is not relevant.

TABLE 1
DRINKING WATER STANDARDS COMPARISON: 1998/1990
FIVE-YEAR REVIEW REPORT
BEACON HEIGHTS LANDFILL – OPERABLE UNIT NO. 2
BEACON FALLS CONNECTICUT

(all units in ug/l)

Contaminants of Concern	1990 Federal Exposure Criteria and Guidance ¹	1998 USEPA Drinking Water Standards ²	1998 State of Connecticut Criteria for Groundwater Classified as GA ³
Benzene	5.0	5.0	1.0
Bis(2-chloroethyl)ether	PQL ⁴	NA	12
1,2 Dichloroethane	5.0	5.0	1.0
Trichloroethene	5.0	5.0	5.0
Vinyl Chloride	2.0	2.0	2.0
Bis(2-ethylhexyl)phthalate	3.0 ⁵	6.0⁶	2.0
Methylene Chloride	5.0	5.0	5.0
1,1 Dichloroethene	7.0	7.0	7.0
Chlorobenzene	100	100	100
Ethylbenzene	700	700	700
Toluene	2,000	1,000⁶	1,000
Xylene	10,000	10,000	530
Acetone	3,500 ⁴	NA	700
2-Butanone	1,750 ⁴	NA	400
4-Methyl 2-Pentanone	1,750 ⁴	NA	350

Notes:

- 1) Beacon Heights Landfill, Supplemental ROD, September 28, 1990, Tables 8 and 9.
- 2) 40 CFR, Part 141, Para. 141.61, promulgated July 1, 1994. Still in effect in September 1998.
- 3) Connecticut General Statutes, Title 22a, Part 133k, Appendix C, promulgated January 30, 1996. Still in effect in September 1998.
- 4) Practical Quantitation Limit
- 5) Based on carcinogenic risk level of 1×10^{-6} assuming 2 liters of water consumed per day.
- 6) Bold numbers indicate a change from the basis used in the 1990 sROD.

TABLE 2
SOIL CLEANUP STANDARDS : 1998/1990
FIVE-YEAR REVIEW
BEACON HEIGHTS LANDFILL - OPERABLE UNIT 2
BEACON FALLS, CONNECTICUT

Contaminant of Concern	1990 Supplemental ROD Soil Cleanup Levels ¹ (mg/kg)	1990 Target Groundwater Concentrations Used to Calculate Soil Cleanup Levels ¹ (ug/L)	1998 US EPA Drinking Water Standards ² (ug/L)	1998 Connecticut Direct Exposure Criteria for Industrial or Commercial Soil ³ (mg/kg)	1998 Connecticut Pollutant Mobility Criteria for Soil ⁴ (mg/kg)
Benzene	0.08	5	5	200	0.02
Bis(2-chloroethyl)ether	0.33	PQL	NA	5.2	1
1,2-Dichloroethane	0.01	5	5	63	0.02
Trichloroethene	0.10	5	5	520	0.1
Vinyl Chloride	0.02	2	2	3	0.04
Bis(2-ethylhexyl)phthalate	0.30	3	6 ⁵	410	1
Methylene Chloride	0.01	5	5	760	0.1
1,1 Dichloroethene	0.09	7	7	9.5	0.14
Chlorobenzene	10	100	100	1,000	2
Ethylbenzene	70	700	700	1,000	10.1
Toluene	100	2,000	1,000 ⁵	1,000	20
Xylene	500	10,000	10,000	1,000	19.5
Acetone	10	3,500	NA	1,000	14
2-Butanone	10	1,750	NA	1,000	8
4-Methyl 2-Pentanone	10	1,750	NA	1,000	7

Notes:

- 1) Beacon Heights Landfill, Supplemental ROD, September 28, 1990, Tables 8 and 9.
- 2) 40 CFR, Part 141, Para. 141.61, promulgated July 1, 1994. Still in effect September 1998.
- 3) Connecticut General Statutes, Title 22a, Part 133k, Appendix A, promulgated January 30, 1996. Still in effect September 1998.
- 4) Connecticut General Statutes, Title 22a, Part 133k, Appendix B, promulgated January 30, 1996. Still in effect September 1998.
- 5) Bold numbers indicate a change from the basis used in the 1990 sROD.

4.0 SUMMARY OF THE REQUIREMENTS OF THE ROD AND SUPPLEMENTAL ROD

The selected remedy for the Site was contained in the 1985 ROD and subsequently modified in sROD, issued in 1990. The initial recommendations in the ROD consisted of the following activities:

- Excavation of satellite areas of contamination for consolidation with the main landfill prior to closure.
- RCRA capping of the consolidated wastes, including gas venting and stormwater management controls.
- Installation of a perimeter leachate collection system.
- Extension of a public water supply line along Skokorat Road and Blackberry Hill Road to provide water service to current residences.
- Enclosure of the Site with security fencing.
- Installation of a more extensive groundwater monitoring system.
- Collection of leachate generated by the landfill and transportation of it to a licensed wastewater treatment facility or an on-site treatment facility followed by discharge to a tributary of the Hockanum Brook.
- Preparation of further studies and a sROD to select the manner and location of leachate treatment (on-site or off-site), the extent of excavation of contaminated soils, and the need for air pollution controls on the landfill gas vents.

A sROD was completed in September 1990 that utilized information contained in a Pre-Design study, prepared by the Potentially Responsible Parties (PRPs), to evaluate on-site and off-site treatment alternatives. The major components of the sROD included:

- Contaminated leachate from the Site would be transported and subsequently treated at the Naugatuck, Connecticut wastewater treatment facility (the Naugatuck facility).
- Contaminated soils, located outside the main landfill, would be excavated to levels specified within the sROD and placed under the cap.
- Landfill cap gas vents would be constructed such that they could be augmented with air pollution mitigating devices in the event that future air monitoring should require such action. In addition, post-construction air quality monitoring would

be conducted at the Site, specifically at, but not limited to, the locations of each gas vent.

The sROD stated that actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected, may present an imminent and substantial endangerment to the public health or welfare or to the environment. The sROD further declared that the selected leachate treatment and disposal alternative and the soil and air pollution control determinations will be protective of human health and the environment at the completion of the remediation. The alternative would attain Federal and State requirements that are applicable or relevant and appropriate and would be cost-effective.

5.0 SUMMARY OF THE RESPONSE ACTION PERFORMED THIS PERIOD

Construction of the remedial facilities at the Beacon Heights Landfill began in March 1993 with rehabilitation of a portion of the Town of Beacon Falls sewer system receiving the leachate from the landfill. Commencement of construction of the landfill cap and leachate collection and transportation system soon followed. Substantial completion of the project was to be accomplished by September 30, 1993. However, due to a delayed construction start, scheduling delays, and problematic site conditions, construction was not substantially completed until December 6, 1995. Certain components of the response action, as constructed, varied from the selected remedial action described in the ROD and as amended in the sROD. An Explanation of Significant Differences (ESD) was prepared for the Site, describing the changes from the ROD and sROD and the reasons these changes occurred. The ESD was completed in September 1998. A general description of the remedial action completed this period follows in Sections 5.1 - 5.7.

5.1 Excavation and Consolidation of Contaminated Soil in the Main Landfill

Erosion and sediment controls were installed in March 1993 prior to initiation of earthmoving activities at the Site. Excavation of contaminated soil from areas outside the main landfill began in approximately April 1993 and was substantially complete by July 1993. Excavated material that was not immediately placed in the landfill was stockpiled on the Site for later consolidation in the landfill. Following excavation of contaminated soil from the satellite areas, confirmation sampling was conducted to verify that cleanup goals had been met.

Materials excavated during construction activities for the leachate collection system and the leachate transfer lines continued to be consolidated in the landfill through approximately December 1993. Consolidation of some stockpiled material was not completed, however, until approximately August 1994, when the cap was finished.

5.2 Leachate Collection System

Installation of leachate collection piping began in approximately July 1993 and was substantially complete by December 1993.

5.3 Leachate Transportation and Treatment

The sROD called for collection of leachate at the landfill and transportation of that liquid through a dedicated pipeline to the City of Naugatuck wastewater treatment facility. There the leachate would be treated with the City's wastewater and subsequently discharged to the Naugatuck River. Due to concerns regarding the route of the proposed dedicated pipeline and cost considerations, a decision was made by the PRPs to negotiate with the Town of Beacon Falls to discharge the leachate into their sewer system and treat the leachate at the Town's wastewater treatment facility. Those negotiations were successful and provisions were made to connect the leachate pipeline directly to the Town's sewer system. The Town required the PRPs to construct certain improvements to both the sewer system and the wastewater treatment facility as conditions of the agreement. EPA, in consultation with the CT DEP, agreed to this revision in the requirements of the sROD.

Connection of the leachate transport pipeline to the Town of Beacon Falls' sewer line was completed in July 1993 and pumping of leachate to the Town's wastewater treatment facility began immediately thereafter. The expansion of the Town's wastewater treatment facility was completed in approximately July of 1995.

5.4 RCRA Landfill Cap

The ROD called for capping of the landfill with a RCRA cap that would consist of a two component low permeability cap comprised of a flexible synthetic membrane covering an 18-inch thick low permeability soil layer. Acquisition of a source for the low permeability soil and the ability to transport the soil to the site became an issue once the PRPs retained a contractor. Public inconvenience caused by 6,500 truckloads of soil being delivered to the site was also a concern. Consequently, the PRPs proposed, and EPA accepted, an alternative capping system that would replace the low permeability soil with a prefabricated geosynthetic clay liner that provided an equivalent level of performance.

Capping of the landfill began in June 28, 1993 and was substantially completed in August 1994 with the placement of cover soil, topsoil, seed, and an erosion mat over the south slope.

5.5 Compensatory Wetlands

The construction of the landfill cap and other facilities associated with the Site resulted in the disturbance of about 18 separate wetland areas on or adjacent to the Site. In accordance with the Clean Water Act, wetlands disturbed or destroyed by the installation of the remediation system are to be replaced in kind. A total of 5.7 acres of wetlands were required by EPA to be created for the site.

Initially, an attempt was made to design the compensatory wetlands to be fully located on the original 82 acres that comprised the site. However, the areas that could be used for wetlands construction were limited due to the presence of the landfill cap and leachate collection system, topography, hydrology, soils, and the availability of surface water and groundwater. Property abutting the Site to the west, owned by Mr. Wilfred Swan, was purchased to construct these wetlands. The land purchase also permitted the expansion of the "Site" for the purposes of the provisions of the CERCLA remedial activities at the Site. The wetlands were constructed on the former Swan property and provide a natural habitat for plant and animal species.

5.6 Leachate Flow Reduction Activities

These activities were conducted at the request of EPA primarily to control infiltration of groundwater in the leachate collection system and to collect and manage seeps of leachate around the perimeter of the landfill. Work for these activities was initiated on October 15, 1997 and substantially completed on December 5, 1997. The scope of work included installation of a perimeter drainage ditch liner, replacement of a temporary leachate transfer line from the Boulder Area seep with a permanent double-walled pipeline, construction of the Florida Area seep collection system and transfer pipeline, and planting of trees to enhance evapo-transpiration thereby reducing groundwater levels and migration of groundwater into the leachate collection system.

5.7 Additional Connections of Private Residences to Public Water Supply

During the fall of 1994, the owners of the six residences who had declined the earlier offer from the PRPs to connect to the public water supply were again contacted. The PRPs again asked if they would like to be connected to the municipal water supply system. Four residents once again declined, while the remaining two residences accepted the offer and were connected during October 1994.

6.0 SITE VISIT SUMMARY

Site visits were conducted during October, November, and December of 1997 both to monitor site activities that were occurring at that time and to satisfy the requirements for the Five-Year Review. During this period, the PRPs' contractor was conducting activities to control off-site migration of surface water flow, to collect leachate seeps, to reduce leachate flow volume, and to improve the leachate transport system.

The landfill appeared to be functioning as designed. No slope failures or other noticeable operational problems were observed. Surface water collection benches were intact and appeared to be operational. No problems were noted with the landfill gas vents. No complaints were noted regarding operation of the Beacon Falls sewer system or the wastewater treatment facility.

Two items of concern, however, were observed which will require long-term monitoring and perhaps may ultimately require corrective action. These items were the accumulation of iron oxide sediments and/or iron bacterial growths in the leachate collection system and the appearance of additional leachate seeps.

The leachate collection system transfer line, which extends from below the Florida Area to the sewer manholes on Skokorat Road, was found to have a noticeable buildup of iron sediment and bacterial growths. This condition develops when oxygen is introduced into the iron-rich leachate. The oxygen causes formation of an iron precipitate that forms a scale on the inside of the pipe. The oxygen also encourages bacterial growths along with the iron scale. The gradual accumulation of scale and bacterial growths reduces the cross-sectional area of the pipeline and could eventually block or severely restrict the capacity of the pipe. The accumulated scale in the pipeline was being cleaned by the PRPs' operation and maintenance contractor while EPA's oversight personnel were present on Site. This condition has been identified as an on-going concern and must be monitored in future Operation and Maintenance (O&M) site visits.

Three leachate seeps were observed to be flowing during the Site visits. The first seep was located approximately 50 feet to the southwest of the gate in the western perimeter fence, just north of the Boulder Hole Area. The other two seeps were in the vicinity of seep monitoring points 1 and 2. The PRPs' representative on Site stated that the O&M contractor would be directed to monitor these seeps in future Site visits.

7.0 REVIEW OF MONITORING DATA

The PRPs prepared and implemented a Groundwater, Surface Water, Sediment, and Seep Monitoring Plan for the Site in accordance with the requirements contained in the ROD

and sROD. The first round of sampling was conducted in December 1996 and subsequent sampling was performed in April, July, and October of 1997. Monitoring activities included the collection and analysis of samples of each medium, collection of water level data, and analysis the data. The results of the monitoring program to date were presented in the 1997 Annual Report. "Points of compliance" were established, consisting of seven groundwater monitoring wells located downgradient from the landfill.

Gas emissions from the landfill were sampled and analyzed August 14, 15 & 16, 1996, and were found to not exceed either Federal or State Clean Air Act standards, and as such, in accordance with the sROD, the BHGC was not required to augment their current gas venting system to include active gas collection and treatment.

8.0 AREAS OF NON-COMPLIANCE

The PRPs estimated leachate flow rates have not been achieved. Upon completion of the cap, the projected leachate flow rate was expected to decrease to approximately 20 gallons per minute (GPM) and ultimately drop to approximately 5 GPM. However, the leachate flow rate is current still approximately 30 GPM.

Groundwater quality continues to exceed EPA MCLs and Connecticut Ground Water Quality Criteria for Class GA. Insufficient data is available at this time to evaluate whether the PRPs will be able to demonstrate a "significant decrease" in groundwater contaminants, as required in the Consent Order. For this reason, quarterly groundwater monitoring will continue to be required.

9.0 FIVE-YEAR REVIEW SUMMARY OF FINDINGS

The primary purpose of this second five-year review is to evaluate whether the remedial action selected for the Beacon Heights Site remains protective of public health and the environment. The landfill cap has effectively isolated the refuse and contaminated soils placed under the cap during remedial activities. There have been no known incidences of cap failure or damage.

Leachate from the landfill continues to be generated, in large part, due to groundwater flow migrating upward under the cap. However, the leachate collection and transport system appears to be effectively collecting the leachate and transporting it to the Town of Beacon Falls wastewater treatment facility. Leachate flow rates have not conformed with the predicted reduction in volume once the cap was in place. Flow rates were expected to drop from an initial average of 20 gallons per minute (gpm), immediately after the landfill was capped, to less than 5 gpm, three years after capping was completed. Average flow

rates have remained around 31 gpm while maximum flow rates have reached as high as 67 gpm. However, the leachate collection and transportation pipelines have a capacity well in excess of this rate and are fully capable of accommodating this unexpectedly high flow rate.

Similarly, the Beacon Falls wastewater treatment facility appears to be capable of accepting the leachate flow for an indefinite period. The expanded facility has a design flow of 600,000 gallons per day (GPD). The average leachate flow results in a daily flow rate of approximately 45,000 GPD, only 7.5 percent of capacity. Based on existing wastewater flows as reported by the Town of Beacon Falls, approximately 400,000 GPD including the leachate, the treatment facility appears to be capable of treating both the leachate and the community's wastewater flow for some time into the future.

The leachate collection and transportation pipelines on Site appear to be subject to a buildup of inorganic scale and bacterial growth which has the effect of reducing the capacity of, and potentially clogging, the pipes. This concern is known to the PRPs and corrected on an as-needed basis and as described in the O&M Plan prepared for the Site.

10.0 RECOMMENDATIONS

The PRPs should continue to implement the Groundwater, Surface Water, Sediment and Seep Monitoring Plan and the Post-Closure Operations and Maintenance Plan, in accordance with these documents.

Operational concerns include:

- The buildup of bacteria and/or iron precipitation in the leachate collection and transportation pipelines. When such buildups cause a backup in the leachate flow, the pipelines must be cleaned. Failure to do so could result in the release of leachate to piping overflows or pipe failures.
- Leachate flow. Capping of the landfill should have resulted in a decreasing trend in leachate flow. If the flow remains the same or shows an increasing trend further investigation may be necessary to identify the possible cause of the trend. If in the future the Town's wastewater treatment facility approaches its design capacity, an unexpected increase in leachate flow could require a curtailment in future connections to the sewerage system.
- New leachate seeps in areas downgradient of the landfill. Seeps that do occur should be sampled to determine if they contain leachate contaminants in significant quantities to be a risk to human health and the environment.

Monitoring concerns include:

- The 1997 Annual Monitoring Report sampling data for MW-11 and MW-13 show significant levels of VOCs in both. Since MW-11 and MW-13 are the most-downgradient bedrock wells at the site, the downgradient extent of the VOC plume in bedrock is not, nor can it be, defined. In a letter dated August 24, 1998 EPA has required that at least two additional bedrock monitoring wells be installed approximately 300 to 400 ft downgradient from MW-11 and MW-13. These two additional wells must be installed and monitored.
- The size of the groundwater data set needs to increase before meaningful statistical analysis can be done. A statistically rigorous analysis will need to be performed to demonstrate that contaminant concentrations are “significantly decreasing”, as required by the Consent Order.
- The PRP must not take liberties by changing the monitoring protocols without prior review and approval by EPA. The PRP’s shall not alter the sampling parameters and/or reduce the frequency of sampling without EPA’s concurrence.

The owners of the private residences on Blackberry Hill and Skokorat Roads that refused connection to the public water supply system should be periodically contacted and offered the opportunity to connect to public water supply.

11.0 STATEMENT OF PROTECTIVENESS

EPA certifies that the remedy selected for this site remains protective of human health and the environment.

12.0 NEXT FIVE-YEAR REVIEW

The next five-year review will be conducted by September 2003.