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SYLVESTER (GILSON ROAD) SUPERFUND SITE SECOND - FIVE YEAR REVIEW

September 1999

57 GILSON ROAD
NASHUA, NEW HAMPSHIRE
EPA ID NHD099363541

Prepared by

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I. INTRODUCTION

Authority Statement and Purpose. EPA Region I conducted this review pursuant to CERCLA section 121(c), NCP Section 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (May 23, 1991) and 9355.7-02A (July 26, 1994). This Review is a Policy Review of a remedy that was selected prior to the enactment of the Superfund Amendments and Reauthorization Action of 1986 (SARA) which, upon attainment of ROD cleanup levels, will not allow unlimited use and unrestricted exposure. This is a Level I review.

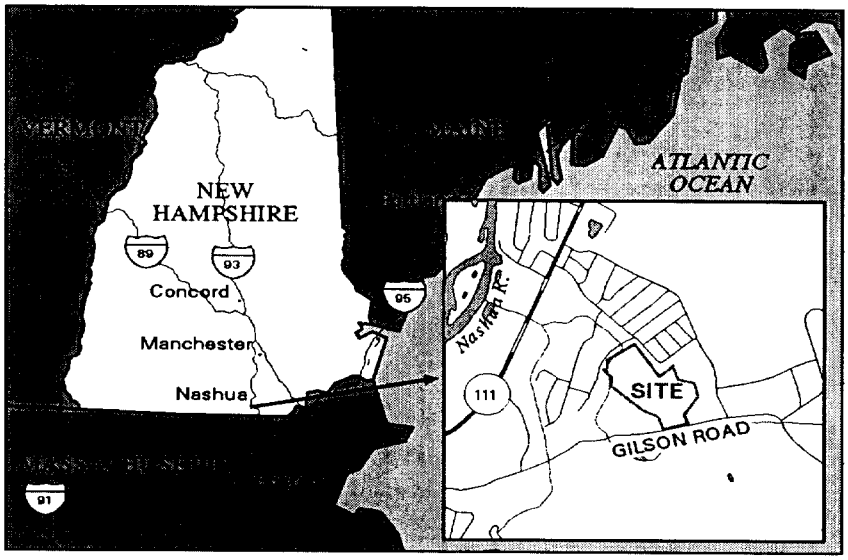

Figure 1 Site Locus Map

The purpose of this review is two-fold: (1) to confirm that the remedy, as described in the Record of Decision (ROD) and/or remedial design, remains effective at protecting human health and the environment, and (2) to evaluate whether original cleanup levels remain protective of human health and the environment.

II. SITE HISTORY/RESPONSE ACTIONS/REMEDIAL ACTION OBJECTIVES

The Site is located north of Gilson Road and east of NH Route 111 (West Hollis Street) in Nashua, New Hampshire (*Figure 1*) and is primarily surrounded by residential properties. The Site consists of a former sand and gravel borrow pit which was used as a hazardous and solid waste disposal area from the late 1960s through 1979, and is approximately 28 acres in size.

The hazardous waste disposed of at the Site was delivered by tanker trucks and piped directly onto the ground surface of the borrow pit or into subsurface leaching fields. The release of these contaminants created a health hazard by contaminating surface soils and the groundwater. Unknown quantities of drums containing liquid and solid waste were also buried in the borrow pit. Liquid waste consisted primarily of volatile organic compounds (VOCs).

The New Hampshire Department of Environmental Services (NHDES) and EPA acquired access and began to contain and investigate this Site in 1980. The major public health concerns centered on the impact to the nearby Lyle Reed Brook which is part of the Nashua/Merrimack River drainage basin. The Merrimack River is a drinking water supply for the City of Lowell, Massachusetts.

1981 Emergency Response

Initial investigations demonstrated that high concentrations of heavy metals and VOCs were in the groundwater under the Site *(Figure 2)*. The contamination formed a plume in the groundwater which was moving from the Site toward Lyle Reed Brook. Pre-remedial action activity included implementation of hydraulic controls at the Site by the NHDES and EPA to prevent the migration of highly contaminated groundwater from reaching Lyle Reed Brook *(Figure 2)*.

Table 1
List of Chemicals of Concern and Associated ACL and AGQS Criteria
Gilson Road Superfund Site
Nashua, New Hampshire

Compound	ACL (ug/L)	AGQS (ug/L)
Vinyl Chloride	95	2
Benzene	340	5
Chloroform	1505	6
1,1,2-Trichloroethane	1.7	5
Tetrachloroethylene (Tetrachloroethene)	57	5
Trichloroethylene (Trichloroethene)	1500	5
Methyl Ethyl Ketone (2-Butanone)	8000	170
Chlorobenzene	110	100
Methylene Chloride	12250	5
Toluene	2900	1000
1,1-Dichloroethane	1.5	81
1,2-Dichloroethane	1800	15
1,1,1-Trichloroethane	200	200
Methyl Methacrylate	350	NS
Phenols	400	4000

1. NS = no standard established for this constituent

1982 Record of Decision

In July 1982, EPA issued a ROD which specified that a slurry wall would be installed around a twenty-acre area to contain the most contaminated portion of the groundwater plume and that a surface cap would be placed over the Site (within the slurry wall) to minimize infiltration. The ROD also approved groundwater treatment in principle, but deferred the selection of the treatment process until pilot plant studies were completed. By December 1982, the installation of the slurry wall and synthetic cap were completed. The slurry wall and cap, in combination, encapsulated the most highly contaminated groundwater, greatly impeding its migration to surface water or drinking water wells.

1983 Supplemental Record of Decision

In September 1983, EPA issued a Supplemental ROD (SROD) for the Site. Pursuant to the SROD, the NHDES constructed a 300 gpm groundwater treatment plant and began recovery and treatment operations in April 1986. The treatment plant removed inorganic compounds (metals) disposing of metal sludges in an on-site lined landfill (RCRA Type C), and removed VOCs, destroying them by incineration. The SROD also established cleanup goals within the slurry wall containment area for 16 compounds. These cleanup goals, known as Alternate Concentration Limits (ACLs), were set at levels deemed necessary to adequately protect human health and the environment.[1] ACLs set for this project (as defined as all areas impacted by the plume including but not limited to the geographical area of the land acquired by the State through eminent domain) are presented in *Table 1*, along with the New Hampshire drinking water standards, Ambient Groundwater Quality Standards (AGQS), which are provided for purposes of comparison only.[2]

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[1] The ACLs that are established as the cleanup levels for the Site pursuant to the 1983 SROD should not be confused with the alternate concentration limits established in Section 121(d)(2)(B)(ii) of CERCLA as part of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

[2] Where federal maximum contaminant levels have been promulgated under the Safe Drinking Water Act, NH AGQS are set equivalent to such standards. Ten of the sixteen COC for the Site have NH

Muncipality Extends Water Line

The City of Nashua extended municipal water to the area surrounding the Site in 1983. The main line runs along NH Route 11 to Countryside Drive and on to Gilson Road then east along Gilson Road to a point adjacent to the Site. All but two residents chose to be connected to the system. Past sampling of these two residential wells has not shown any exceedences of drinking water standards. The two properties, although are near the Site, are not located hydraulically downgradient to the Site.

Explanation of Significant Differences (ESD)

Pursuant to the SROD, the NHDES's contractor began an evaluation of the groundwater remedy in 1988, and, based on the results of that evaluation, EPA determined that the ACLs had not been met within the two-year expected time frame established in the SROD. As a result, in 1990, EPA issued an ESD that included the construction of a soil vacuum extraction system and installation of six additional groundwater recovery wells. In addition, the NHDES was required to perform a Remedial Action Evaluation Study, in the event that ACLs were not attained within three years.

Interim Close-Out Report

On April 8, 1992, EPA issued this report and concluded that all long term response action requirements for this Site were met as specified in OSWER Directive 9320.2-3A, as updated by OSWER Directive 9320.2-3B.

Remedial Action Evaluation Study

The Remedial Action Evaluation Study analyzed data collected through Fall 1994, and determined that the additional activities initiated as a result of the ESD had succeeded. All ACLs had been attained in all areas except 1,1-dichloroethane and 1,1,2-trichloroethane. Subsequent groundwater monitoring, conducted during the Spring of 1995, in response to the monitoring requirement of the ESD, determined that the ACL for 1,1,2-trichloroethane had also been attained. With respect to 1,1-dichloroethane, the ACL of 1.5 ppb was not attained. This ACL is below the detection limit of analytical equipment using standard methods. The 1.5 ppb standard is also below the New Hampshire AGQS of 81 ppb. No maximum contaminant limit (MCL) has been set for this contaminant. EPA is considering adjusting the ACL for 1,1 dichloroethane that was set in the SROD in a future decision document to be issued following the Remedial Action Assessment Phase of the Remedial Action, pending continued sampling.

Surface Water Quality. The State has established Surface Water Quality Regulations (SWQRs), Env-Ws 430, for toxic substances. Lyle Reed Brook complies with these regulations. Surface water sampling conducted in Lowell, Massachusetts, where the Nashua River serves as a public drinking water supply, did not detect arsenic concentration above the reportable detection limit of 2 µg/L (2 ppb).

Termination of Groundwater Treatment System. In January 1996, the groundwater treatment system was shut down and placed in a "ready" state. During the time period that the groundwater treatment

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AGQS values which are lower (more stringent) than their respective ACLs (vinyl chloride, benzene, chloroform, tetrachloroethylene, trichloroethylene, methyl ethyl ketone, chlorobenzene, methylene chloride, toluene, and trans-1,2-dichloroethane). For one COC, 1,1-trichloroethane, the ACL and the AGQS are the same. Of the remaining five COCs, one constituent (methyl methacrylate) does not have an AGQS, and four constituents (1,1,2-trichloroethane, 1,1-dichloroethane, selenium, and phenols) have lower, more stringent ACL values than their respective AGQS values.

system was operating, it processed more than one billion gallons of contaminated groundwater and removed approximately 430,000 pounds of contaminants.

Based on the data collected as part of the Remedial Action Evaluation Study, the risk assessment performed by Haley and Aldrich, Inc. (H&A) revealed no current or future significant risk to human health posed by site contaminants. At this Site, the pre-SARA 1982 ROD and 1983 SROD do not require the restoration of the groundwater to drinking water quality. Instead, EPA established ACLs to address the threat of migration to Lyle Reed Brook, and required the extension of the municipal water supply to the area surrounding the Site. For this reason, the H&A risk assessment did not include a consideration of the use of the groundwater for drinking water as an exposure scenario.

Remedial Action Assessment Phase

EPA issued an internal memorandum, dated May 19, 1997, discussing the termination of the groundwater treatment system and planning for the sampling and other activities to be conducted as part of the verification of attainment phase of the cleanup ("Remedial Action Assessment Phase" or "RA Assessment Phase"). The RA Assessment Phase includes a stabilization phase, to determine whether the aquifer is stable (approximately 3 years), followed by a verification phase (approximately 3 years). During the RA Assessment Phase, the NHDES is responsible for maintaining the groundwater treatment plant, performing groundwater sampling and monitoring site conditions, and preparing biennial reviews of the data.

Maintenance of Remedial Components. During the RA Assessment Phase, the NHDES has maintained the groundwater treatment plant in a ready state in the event that site conditions warrant resuming treatment of groundwater. Since May 1996, three full-time staff have been responsible for general maintenance of the property. Integrity evaluations of the slurry wall have concluded that it remains intact and effective at retaining contaminated groundwater. Regular maintenance and mowing of the property have prevented damage to the cap. The chain link fence that surrounds the property remains intact and in good condition.

Monitoring of Site Conditions. The NHDES has also sampled groundwater and surface water on a semi-annual basis. Since groundwater treatment was terminated in January 1996, the NHDES has collected five rounds of groundwater monitoring (two in 1997, two in 1998, and one in the first half of 1999). The slurry wall provides a physical barrier. Hence, it provides a dividing line that must be taken into consideration when analyzing the behavior of contaminants within the slurry wall and contaminants outside the slurry wall. The slurry wall separates the overburden groundwater and (to a lesser extent) bedrock groundwater. For this reason, groundwater analytical results generated for monitoring wells have been broken down into four distinct groups: 1) interior bedrock; 2) interior overburden; 3) exterior bedrock; and 4) exterior overburden. *Figure 2* identifies water quality monitoring locations, including eleven surface water sampling points. *Figures 3-7* specifically differentiate between the four aforementioned groups of monitoring wells and provide analytical data trends (*Figures 3* and *4* identify interior overburden wells, *Figure 5* identifies interior bedrock wells, *Figure 6* shows the exterior overburden wells, and *Figure 7* identifies exterior bedrock wells).

Contaminant Rebound within Slurry Wall. Analytical data generated from samples taken from monitoring wells interior of the slurry wall indicate that contaminant rebound occurred and peaked within 1 to 2 years following shut-down of the groundwater treatment system. This conclusion is made by comparing the analytical results from two sampling rounds occurring in 1995 (prior to treatment plant

shut down) to the analytical results generated from 1996 through 1999 (after the treatment system was shut down). *(See Figure 3, 4, and 5)*

In spite of the rebound, all ACLs continue to be met within the slurry wall with the exception of 1,1-dichloroethane and chlorobenzene. Trends indicate that increased concentrations of contaminants in general, are now decreasing.

Contaminant Rebound outside the Slurry Wall. The analytical data generated from monitoring wells exterior of the slurry wall show similar rebound trends as that of monitoring wells located interior of the slurry wall, however, fewer contaminants have been identified in monitoring wells located down gradient and immediately adjacent to the slurry wall. The extent of contamination is limited to wells in close proximity to the slurry wall. Outside of the slurry wall, all ACLs continue to be met except for 1,1-dichloroethane. *(See Figure 6 and 7)*

Due to the continued contaminant rebound within and outside the slurry wall, it appears that the stabilization phase of the remedial action is continuing.

Data Gap. Upon review of the data summarized in *Figures 6* and *7*, a data-gap was identified down gradient of the property at the Proposed GMZ boundary. Therefore, additional data will be required to assess the presence of COC in bedrock groundwater at the Proposed GMZ boundary (see *Figure 2* for proposed location of the supplemental bedrock well).

Upon review of the data summarized in *Figures 3 through 7*, another data-gap was identified concerning metals in groundwater and surface water. Therefore, additional data will be required to assess the presence of metals in groundwater and surface water.

Continued Maintenance of Site and Sampling . The State of New Hampshire is responsible for maintaining the treatment plant, the cap, and the slurry wall, and for the sampling and analysis of identified wells. NHDES will continue to sample wells twice a year. NHDES will also sample surface water and groundwater for the 8 RCRA Metals.

Development of Institutional Controls. Neither the ROD, SROD or ESD require institutional controls. The State owns and controls the 28-acre site and, in 1983, the Town extended a municipal water supply to the area surrounding the Site. While no residents are drinking groundwater impacted by the Site, EPA and the NHDES are working together to develop appropriate institutional controls. A copy of a proposed groundwater management zone, pursuant to NH Env-Ws 410, is attached as Figure 2.

III. STANDARDS (ARARs) REVIEW

The pre-SARA 1982 ROD and the 1983 SROD do not require the restoration of the groundwater at the Site to drinking water quality. Instead, EPA established pre-SARA ACLs to address the threat of migration to Lyle Reed Brook, and required the extension of the municipal water supply to the area surrounding the Site. Thus, drinking water standards are not ARARs at this Site. At this time, sampling indicates that Lyle Reed Brook is in compliance with current New Hampshire surface water quality regulations. For these reasons, EPA finds that there are no newly promulgated ARARs that call into question the protectiveness of the remedy at this Site.

IV. SITE VISIT

The project is currently maintained and staffed with 3 full time employees under contract with the State of New Hampshire. EPA visited the Site on January 21, 1999 and July 7, 1999. The State periodically inspects and maintains the cap as required.

V. AREAS OF NONCOMPLIANCE

The ACL for chlorobenzene has been exceeded due to rebounding within the slurry wall. 1,1-dichloroethane continues to exceed the ACLs both inside and outside the slurry wall. There are no other areas of non-compliance. It is expected that the levels of contamination rebound will decrease in the near future, and that the levels of chlorobenzene in particular will soon once again attain the ACL. As stated above, with respect to 1,1-dichloroethane, the ACL of 1.5 ppb is below the detection limit of analytical equipment and is also below the NH AGQS of 81 ppb. It is expected that the levels of 1,1-dichloroethane will decrease over time. EPA is considering adjusting the ACL for 1,1- dichloroethane pending continued sampling.

VI. RECOMMENDATIONS

- To address the data gap mentioned above, NHDES shall install one additional bedrock and one overburden monitoring well downgradient of plume towards Troutbrook Drive (see *Figure 2* for location).

- To address the second data gap mentioned above, all wells in the monitoring program and the surface water in Lyle Reed Brook should be sampled and analyzed for the 8 RCRA Metals by NHDES twice per year.

- NHDES shall continue the current monitoring program which calls for sampling and analysis twice a year and producing reports every other year.

- NHDES shall finalize the institutional controls and enforce them once implemented.

VII. STATEMENT ON PROTECTIVENESS

Although there are exceedences of two ACLs within the slurry wall, and exceedences of one ACL outside the slurry wall, EPA has determined that the remedy implemented at this Site remains protective of human health and the environment for the following reasons: (1) the groundwater at the Site and downgradient is currently not being used as a drinking water source; (2) the rebounding experienced is on a downward trend; and (3) Lyle Reed Brook is in compliance with New Hampshire Surface Water Quality Regulations. As stated above, in October 1996, H&A performed a risk assessment which did not include a drinking water scenario because the goal of the site cleanup was to prevent migration. The risk assessment found that there was no current or future significant risk to human health posed by site contaminants. The sampling results obtained since 1996 would not alter that conclusion.

VIII. NEXT REVIEW

The next five-year review will be conducted in September 30, 2004.

Patricia L. Meaney, Director
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EPA Region I - New England

9/30/99
Date

SITE CHRONOLOGY
GILSON ROAD SUPERFUND SITE
NASHUA, NEW HAMPSHIRE

Pre-1960s	6 acres of site used as borrow pit.
1960s	Illegal disposal of demolition debris & household wastes in old pit.
1970	Illegal disposal first discovered.
1974	Estimated start of hazardous waste disposal on-site.
1976	Court injunction against disposal and removal ordered - ignored by operator.
November 1978	State officials observed drums on-site.
January to October 1979	800,000 gallons of documented hazardous waste disposal on-site by Cannon Engineering.
May 1980	Security fence installed.
May to June 1980	1314 drums removed from surface of site.
Summer 1980	Geophysical surveys performed, test pits and boring/monitoring wells installed by GHR/GZA.
July 1981	Groundwater testing and monitoring began. 0.8 to 1.6 ft./day contaminant migration rate determined.
November 1981	EPA under CERCLA installs emergency groundwater interception trench and recirculation system operated December 1981 to September 1982.
July 1982	First ROD on site issued by EPA to install slurry wall and cap, and proposes pilot study for a 100 gpm treatment system with a 6.2 year operating life.
December 1982	Slurry wall and cap completed.
Winter 1982/1983	Treatment plant pilot study conducted.
June 1983	Pilot plant constructed and studies completed.

September 1983	Second ROD issued on site by EPA: (1) Current (1982) slurry wall leakage rate estimated at 30,000 to 55,000 gallons per day into the fractured bedrock. (2) Mentions possible destruction actions of high contamination concentrations to slurry wall. (3) 300 gpm treatment plant authorized to address above issues. Higher flow rate should reduce operating time to 1.7 years.
April 1984 to April 1986	300 gpm treatment plant constructed.
September 1984 to April 1986	1981 emergency groundwater system in operation.
April 1986	Treatment plant starts operation.
August 1987	EPA report on slurry wall issued.
1988 to 1989	Remedial Program Evaluation of site undertaken by Weston found hot spots of contaminants still existing on-site.
July 1990	EPA issues ESD for site: (1) 6 additional recovery wells should be installed in Fall 1990 to treat stagnant areas within slurry wall. (2) Treatment plant will operate 4 more years (to July 1994). (3) Study required in July 1993 if ACL are not met.
Fall 1990	Soil gas survey and subsurface sampling conducted near well M-19 to find possible separate phase source for Toluene and VOCs.
1991 to early 1993	Six recovery wells install and $1.3 million vapor extraction system installed.

April 1992	Superfund Site Interim Closeout Report
September 1994	First Five Year Review
January 1996	Interim Treatment Plant Shutdown
October 1996	Haley and Aldrich Remedial Action Evaluation Study
May 1997	Remedial Action Assessment Phase
January 1999	EPA Site Visit
July 1999	EPA Site Visit
September 1999	Second Five Year Review