



Roy F. Weston, Inc.  
Federal Programs Division  
217 Middlesex Turnpike  
Burlington, Massachusetts 01803-3308  
781-229-6430 • Fax 781-272-3619

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM  
EPA CONTRACT 68-W5-0009

1 October 1998  
11098-031-001-5165-70  
DC No. A-3203

Mr. Chuck Schwer  
Vermont Agency for Natural Resources  
Department of Environmental Conservation  
103 South Main Street\West Office  
Waterbury, Vermont 05671-0404

Subject: Final Site Inspection Prioritization Report  
Riverside Avenue Dump  
Burlington, Vermont  
CERCLIS No. VTD981891286  
TDD No. 98-05-0163

Oct 6 9 58 AM '98

Dear Mr. Schwer:

Enclosed are two copies of the Final Site Inspection Prioritization (SIP) Report for the Riverside Avenue Dump property in Burlington, Vermont. The U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration and the Vermont Department of Environmental Conservation comments regarding the contents of the Draft SIP Report have been incorporated. Attachments have been omitted from this final deliverable as no comments or changes to the Attachments were requested during the review process.

Please contact the undersigned at (781) 229-6430 if you have any questions regarding this report.

Very truly yours,

ROY F. WESTON, INC.  
Region I START

James S. Chow  
Site Leader

Daniel Keefe  
Project Leader

Enclosures

cc: L. Johnson (EPA Task Monitor)

**FINAL SITE INSPECTION PRIORITIZATION REPORT  
FOR  
RIVERSIDE AVENUE DUMP  
BURLINGTON, VERMONT**

Prepared For:  
U.S. Environmental Protection Agency  
Region I  
Office of Site Remediation and Restoration  
John F. Kennedy Federal Building  
Boston, MA 02203-0001

CONTRACT NO. 68-W5-0009

CERCLIS NO. VTD981891286  
TDD NO. 98-05-0163  
PCS NO. 5165  
DC NO. A-3203

Submitted By:  
Roy F. Weston, Inc. (WESTON®)  
Superfund Technical Assessment and Response Team (START)  
217 Middlesex Turnpike  
Burlington, MA 01803

23 September 1998

Region I START  
Reviewed and Approved:

James S. Chow  
James S. Chow  
Site Leader

23 September 1998  
Date

Daniel Keefe  
Daniel Keefe  
Project Leader

9/23/98  
Date

J. F. Kelly  
QA Review

9/23/98  
Date

Work Order No. 11098-031-001-5165-70

## DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the EPA Region I and the Roy F. Weston, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START). Professional services performed and reports generated by START have been prepared for EPA Region I purposes as described in the START contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. START, therefore, expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

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## **INTRODUCTION**

The Roy F. Weston, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START) was requested by the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration to perform a Site Inspection Prioritization (SIP) of the Riverside Avenue Dump (Riverside) property on Riverside Avenue in Burlington, Vermont. Tasks were conducted in accordance with the SIP scope of work and technical specifications provided by EPA Region I. A Site Inspection (SI) for the Riverside property was prepared by NUS Corporation on 8 December 1989. On the basis of the information provided in the SI report, the Riverside SIP was initiated.

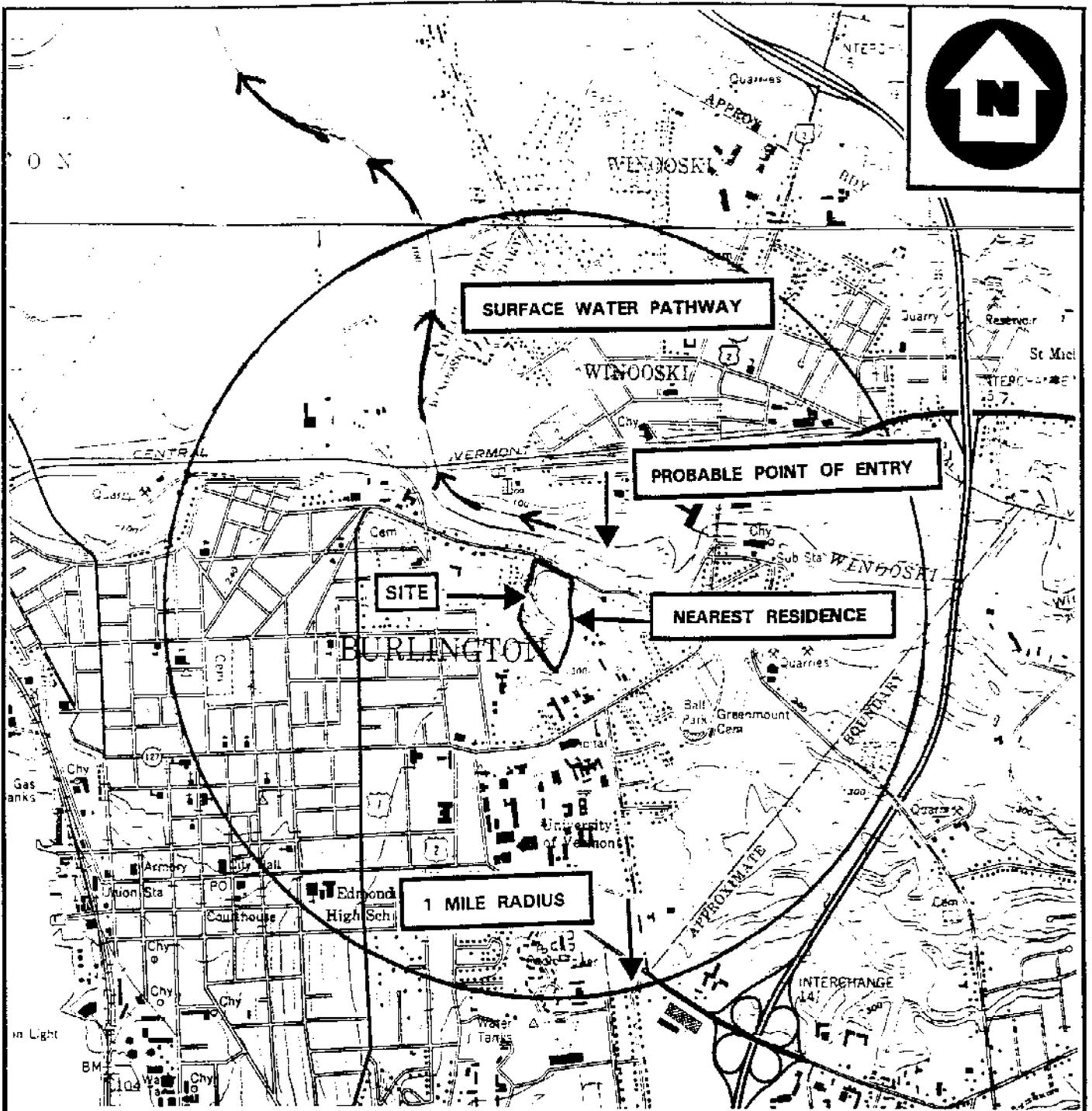
Background information used in the generation of this report was obtained through file searches conducted at the EPA Region I and the Vermont Department of Environmental Conservation (VT DEC), telephone interviews with town officials, conversations with persons knowledgeable of the Riverside property, and conversations with other Federal, State, and local agencies.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

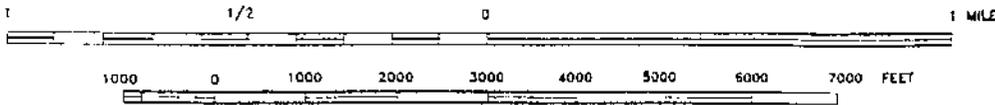
## **SITE DESCRIPTION**

The Riverside property is located at 286 Riverside Avenue in Burlington, Chittendon County, Vermont (Figure 1). The geographic coordinates of the property are 44° 28' 30.0" north latitude and 73° 12' 30.0" west longitude. According to the Burlington Tax Assessor's office, the Riverside property is located on four tax maps, Nos. 40-4, 41-2, 45-3, and 46-1 [44].

The residentially zoned property consists of 20 acres and is jointly owned and managed by the Riverwatch Condominium Association (Riverwatch), Larkin Realty (Larkin), and the Burlington Housing Authority (BHA). Larkin was the original owner and developer of the portion of land now managed by Riverwatch. After development of each portion of the property, Larkin has relinquished management to Riverwatch, an association comprised of homeowners within the condominium complex. Larkin currently owns approximately 51 units within the 215-unit Riverwatch complex; however, Larkin is not involved in the general management of the complex. The property is bordered by Riverside Avenue and the Winooski River to the north, Trinity College to the east, homes and woods to the south, Hillside Terrace and other BHA houses to the west (Figure 2).



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X MINUTE U.S.G.S. QUADRANGLE(S):  
 COLCHESTER, VT. 1948, PHOTOREVISED 1987. BURLINGTON, VT. 1948, PHOTOREVISED 1987



LOCATION MAP

RIVERSIDE AVENUE DUMP  
 RIVERSIDE AVENUE  
 BURLINGTON, VERMONT



REGION 1 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

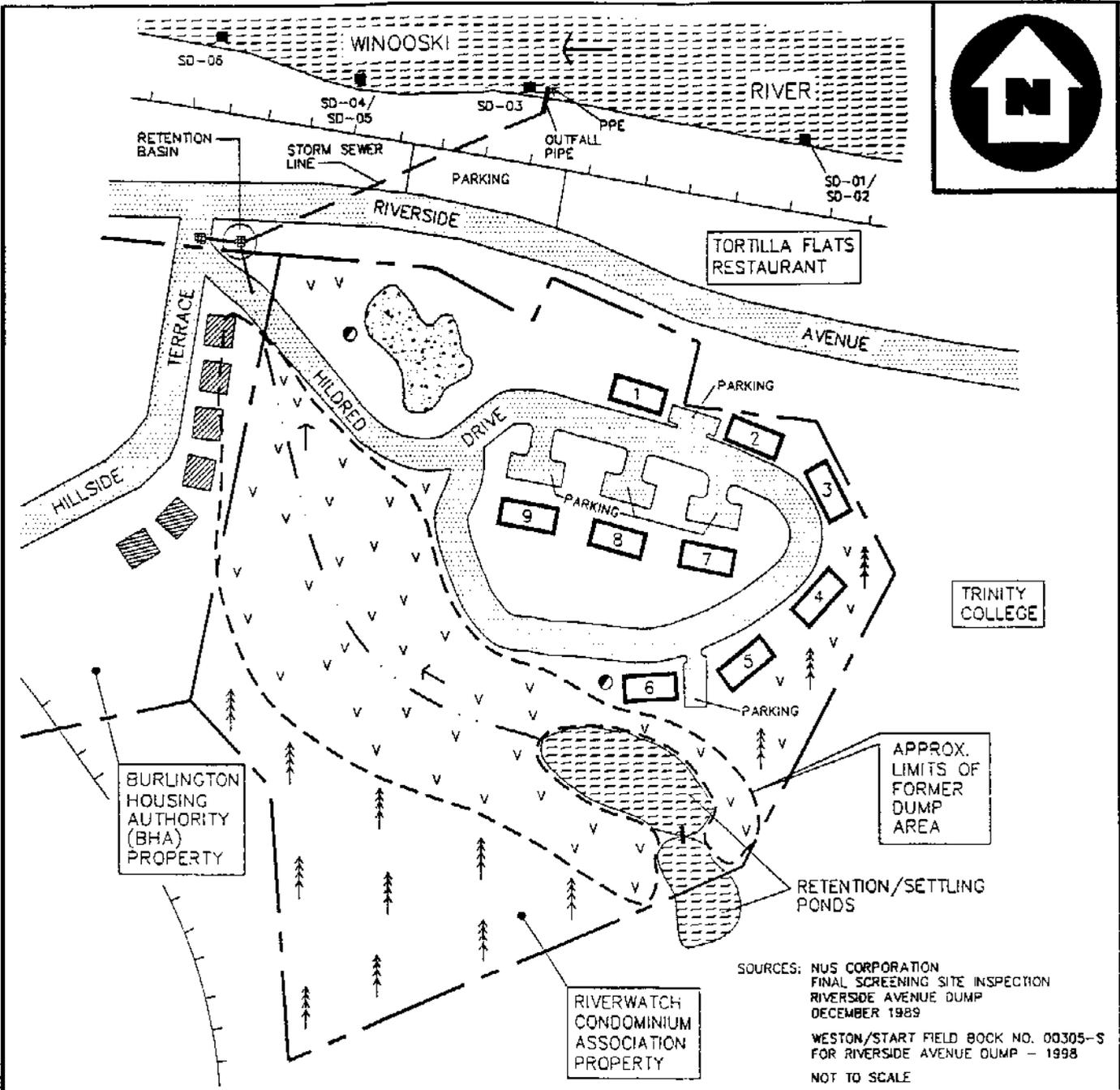
TDD #  
 98-05-0163

DRAWN BY:  
 W. SHAW

DATE  
 5/5/98

FILE NAME:  
 S:\98020010\FIG1

FIGURE 1



SOURCES: NUS CORPORATION  
 FINAL SCREENING SITE INSPECTION  
 RIVERSIDE AVENUE DUMP  
 DECEMBER 1989  
 WESTON/START FIELD BOOK NO. 00305-S  
 FOR RIVERSIDE AVENUE DUMP - 1998  
 NOT TO SCALE

LEGEND			

SITE SKETCH

RIVERSIDE AVENUE DUMP  
 RIVERSIDE AVENUE  
 BURLINGTON, VERMONT



REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 98-05-0163	DRAWN BY: W. SHAW	DATE 4/21/98
FILE NAME: S:\980200\FIG2		FIGURE 2

Currently, the property consists of two housing developments: one, which is managed by BHA, consists of 26 apartments in 13 houses; and the second, which is managed by Riverwatch, consists of 215 condominiums in nine buildings [9; 29].

On 14 April 1998, START personnel conducted an on-site reconnaissance of the Riverside property. START members observed the nine Riverwatch Condominium buildings (Building No. 2 was still under construction) and the BHA duplexes. A former dump area exists between the two housing developments, and is now completely covered by grass. START members also observed the current stormwater drainage network. Water enters this network through two retention/settling ponds located in the southeast corner of the property and then flows through a grass-lined swale across the property (over the former dump area). Upon reaching Hildred Road, the water flows through a culvert underneath the road and into a small retention basin/catchbasin. This basin contains a drain that is connected to a culvert that channels the water under Riverside Avenue into the Winooski River [29].

START also observed two vents that are part of a methane venting barrier system, along with numerous groundwater wells. During the on-site reconnaissance, no levels above background were detected in ambient air with a flame ionization detector (FID); however, readings exceeding 1,000 units above background were recorded adjacent to the exhaust vents of the methane barrier system [29].

START observed standing water in the collection basin during the on-site reconnaissance. Ms. Paula Rudolph, former Property Manager for Riverwatch, suggested that groundwater might also be contributing to the retention basin/catchbasin. However, based on her previous observations, standing water is not present year-round [29].

## **OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS**

Landfill operations began at Riverside in 1950 when the City of Burlington leased the property on Riverside Avenue from Mr. Thomas Reeves. The landfill operated from 1950 to 1961 and for a brief period in 1979 and 1980. Between the years of 1950 and 1961, the landfill received both industrial and municipal waste. The dump was closed in 1961 when a new landfill was opened on Manhattan Drive in Burlington. During the years of 1979 and 1980, Riverside accepted sewage treatment sludge from the Burlington wastewater treatment plant. This sludge was confined to an area of approximately 0.5 acres. No records were kept documenting types of wastes that were disposed of in the Riverside landfill; however, the types of wastes can be inferred from information concerning wastes generated by companies that were known to have sent their wastes to the landfill [9; 12]. Table 1 lists the typical waste types generated by companies known to have disposed of materials at the Riverside landfill.

**Table 1**

**Companies Known to Have Sent Wastes to the Riverside Avenue Dump**

Company	Typical Waste Types Generated
Blodgett Company	Paint sludges and waste solvents
E.B. and A. C. Whiting	Solvent-soaked rags
Edlund Company	Cyanide compounds and barium chloride salts
General Electric Company	Solvents, corrosives, and waste oils
George Little Press	Solvent-based inks
Lane Press	Petroleum-based inks
Kidder Manufacturing, Durgin & Brown, Tridyne	Thinners and solvents
P.P.G. Industries	Waste paints and solvents
Vermont Structural Steel	Excess paints, thinners, and water-soluble oils

[8; 9; 12]

Other wastes that were known to have been disposed of in the Riverside landfill include coal tar sludge, ferric chloride, hospital wastes (allegedly comprised of low-level radioactive wastes), and gasoline-spill cleanup debris [8; 9].

The landfill originated as a ravine, which existed across the Riverside property, that was filled with trash. When landfilling was initiated at the property, concrete and steel culverts were placed into the ravine in order to transport stormwater and other surface water runoff to the Winooski River. Trash was placed in the ravine, covering the drainage system. Later, it was suspected that the culvert was blocked as a pond began to form at the head of the culvert, and as sinkholes and seeps formed along other parts of the drainage system. In 1955, the blocked culvert was suspected to have caused three landslides along Riverside Avenue, resulting in the formation of a 50-foot ravine across the road. Riverside Avenue remained closed for 3 months while a new culvert was installed [8; 9].

On 5 June 1981, the BHA was issued a Land Use Permit by the State of Vermont District Environmental Commission allowing the construction of 13 duplexes on the western portion of the Riverside property. According to BHA representatives, they added a cap which consisted of approximately 2 feet of fill material. The first residence was constructed in 1982. These residences are slab houses and do not contain basements [19; 29].

In 1986, Larkin purchased the eastern portion of the property with the intention of turning it into a housing development; however, prior to construction, Larkin had to meet the requirements set forth by the Vermont Agency of Environmental Conservation (VT AEC). The requirements included the installation of a landfill cap, a methane barrier venting system, and a stormwater drainage network. Since 1986, Wagner, Heindel & Noyes, Inc. (WH&N), a contractor for both Larkin and Riverwatch,

has assisted in characterizing the landfill, delineating the boundaries of trash in the landfill, and meeting the VT AEC requirements for development. This has included the installation of numerous monitoring wells and the periodic collection of groundwater and soil samples [8; 22; 23]. Due to the large number of wells, they are not shown on Figure 2. Details regarding compounds or elements detected are discussed in the appropriate sections of this report.

In September 1986, WH&N reported to the VT AEC that they had observed a culvert pipe along the south bank of the Winooski River which terminated about 10 feet above the water line. WH&N observed leachate discharging from the pipe into the river and reported a strong unpleasant smell associated with the leachate [21].

In May 1987, VT AEC conducted a Preliminary Assessment (PA) of the Riverside property. The dump was noted to be covered by a thin and incomplete cover of sandy material. During the VT AEC reconnaissance, it was observed that the outfall from a culvert underlying the landfill discharged along a steep bank above the Winooski River. A seep (suspected to be landfill leachate) was observed adjacent to the outfall. Both the seep and the outfall were observed discharging an orange liquid at the time of the inspection. According to the PA, groundwater samples collected previously by WH&N revealed levels of metals in excess of Vermont Department of Health maximum contaminant levels (MCLs) for drinking water. Volatile organic compounds (VOCs) were also reportedly detected [13; 21].

In September 1988, an estimated 5,000 cubic yards of sewage sludge was excavated and removed from the landfill and transported to the Burlington City Landfill for disposal [20].

In 1989, NUS Corporation (NUS) conducted an SI of the Riverside property. No signs of stressed vegetation were observed during their site visit; however, a bright orange leachate was observed discharging to the Winooski River via the outfall on the south bank of the river [8; 25].

In 1989, WH&N completed a Site Assessment report entitled "A Study of the Extent of Contamination of the Vadose Zone, Surface Water, Groundwater, and Soil" for the Larkin/Riverside property. This report summarized the work that WH&N had performed at the Riverside property since 1986 [9].

According to property representatives, Larkin began construction of the eastern portion of the property in 1989. All nine of the buildings were reportedly constructed on portions of the property that do not contain buried refuse. Approximately 2 feet of clean fill and clay material was used to cap the landfill [29].

On 19 June 1990, a Land Use Permit was issued by the State of Vermont District Environmental Commission to Larkin, Tarrant, and Hoehl for the property at 286 Riverside Avenue [27].

In September 1990, Stormwater Discharge Permit No. 1-0961 was issued to the 286 Riverside Avenue Project (Larkin Realty) by VT DEC (formerly VT AEC) [30;31; 45].

In September 1991, during the installation of a gas line to the BHA apartments, elevated levels of methane were identified, and a passive venting system was developed along the western boundary of the landfill [28; 29].

In 1992, according to BHA representatives, soil borings indicated that three BHA houses bordering the western portion of the landfill were built on landfill material. The houses were raised and put up on blocks due to localized subsidence problems [29].

On 14 April 1998, START personnel conducted an on-site reconnaissance of the property. Observations from the site reconnaissance have been described previously. On 19 May 1998, START personnel collected sediment samples from the Winooski River to evaluate potential impacts to the surface water pathway.

On 19 May 1998, START personnel collected six sediment samples (SD-01 through SD-06) from the banks of the Winooski River. The sample locations were chosen to evaluate whether a release to the surface water pathway has occurred. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticide/polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). No elevated levels of VOCs or inorganic were detected; however, one pesticide and six SVOCs were detected at elevated levels in sediment samples collected from the Winooski River [47; 48; 49]. It is unknown whether these substances are attributable to the Riverside property as they have not been previously detected at the landfill.

Table 2 presents identified structures or areas on the Riverside property that are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source.

**Table 2**

**Source Evaluation for Riverside Avenue Dump**

Source Area	Containment Factors	Spatial Location
Landfill	Cap (approximately 2 feet thick)	Approximately half of the former landfill property (i.e., 10 acres)

[8; 9; 12]

Table 3 summarizes the types of potentially hazardous substances which have been disposed, used, or stored on the Riverside property.

**Table 3**  
**Hazardous Waste Quantity for Riverside Avenue Dump**

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Industrial Waste	Unknown	1950 - present	1950 - 1961	Landfill
Municipal Waste	Unknown	1950 - present	1950 - 1961	Landfill
Sewage	Unknown	1950 - present	1950 - 1961 1979 - 1980	Landfill

[8; 9; 12]

In addition to Riverside, there are seven other CERCLA sites located in the Town of Burlington [46].

**WASTE/SOURCE SAMPLING**

On 8 October 1986, during field activities for the WH&N Site Assessment, three sludge samples were collected and analyzed for metals, nitrates, total kjeldahl nitrogen (TKN), and pH. The pH of the samples ranged from 7.5 to 7.8. The following metals were detected in the samples: barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc. No reference sample was collected in association with the sludge samples. Table 4 summarizes the sludge samples collected by WH&N [9].

**Table 4**  
**Sludge Samples Collected by WH&N on 8 October 1986**

Sample	Substance	Highest Concentration
SS-3	Barium	107 mg/kg
SS-2	Cadmium	2.53 mg/kg
SS-2	Chromium	50.6 mg/kg
SS-2	Copper	199 mg/kg
SS-2	Lead	85.4 mg/kg
SS-3	Mercury	1.37 mg/kg
SS-2	Nickel	50.9 mg/kg
SS-2	TKN	2,240 mg/kg
SS-2	Zinc	146 mg/kg

TKN = Total kjeldahl nitrogen.  
 mg/kg = Milligrams per kilogram.  
 [9]

## **GROUNDWATER PATHWAY**

Bedrock in the area of the Riverside property is classified as Monkton Quartzite and Winooski Dolomite, and is described as quartzite with occasional relatively thick dolomite layers or alternating layers of quartzite and dolomite of about equal thickness that are generally resistant to both physical and chemical erosion [6; 11]. Bedrock is encountered approximately 60 feet below ground surface (bgs). No bedrock formation mapped within 4-radial miles of the property exhibits karst characteristics. Surficial soils in this area are classified as Lacustrine and Marine Sands and Gravels and are described as marine deposits located along Lake Champlain that are predominantly sand and pebbly sand, well-drained, above the water table [6]. Based on groundwater studies in the Winooski River Basin, the area near the Riverside property is considered to be an area underlain by thick deposits of coarse-grained stratified glacial drift [7].

Groundwater on the Riverside property is estimated to flow in a northerly direction, toward the Winooski River, following the surface topography, at depths ranging from 2.5 feet to 53.6 feet bgs [8; 9].

All or part of the following Vermont cities and towns are located within 4-radial miles of the Riverside property: Burlington (population 39,127), Colchester (population 14,731), Essex (population 16,498), Essex Junction (population 8,396), Shelburne (population 5,871), South Burlington (population 12,809), Williston (population 4,887), and Winooski (population 6,649) [4]. The majority of these towns are supplied water by one of two sources, the Burlington Water Department (BWD) or the Champlain Water Company (CWC) [1; 2; 4].

The BWD provides water to the City of Burlington and Colchester Fire District No. 2. The BWD has a single surface water source located in Lake Champlain, at an approximate depth of 50 feet. The intake for the water supply is located in Burlington Bay, approximately 0.25 miles southwest of the northern portion of the breakwater. This system serves an estimated 53,600 people: 47,600 people in Burlington, and 6,000 people in Colchester Fire District No. 2 [1; 15; 17; 42]. This system is located along the 15-mile downstream surface water pathway.

CWC is located in Burlington and provides water to approximately 65,000 people in the following cities and towns: Colchester, Essex, Shelburne, South Burlington, Williston, and Winooski [2]. The source of this water supply is in Lake Champlain, approximately 0.5 miles off Red Rocks Point (approximately 2.3 miles south of the BWD intake and not within the 15-mile downstream surface water pathway) [2].

There is only one public groundwater well located within 4-radial miles of the Riverside property. The South Burlington Fire District is served by a groundwater well located in South Burlington, approximately 3.1 miles southwest of the property. This well serves an estimated 220 people [15; 17; 32; 33; 34; 35; 36; 37; 42].

Table 5 describes groundwater sources located within 4-radial miles of the Riverside property.

**Table 5**

**Public Groundwater Supply Sources Within 4-Radial Miles of Riverside Avenue Dump**

Distance/ Direction from Site	Source Name	Location of Source <sup>a</sup>	Estimated Population Served	Source Type <sup>b</sup>
3.1 miles southwest	S. Burlington Fire District	South Burlington	220	Unknown

<sup>a</sup> Indicates Town in which well is located.

<sup>b</sup> Overburden, Bedrock, or Unknown.

[1; 2; 15; 17; 32; 33; 34; 35; 36; 37]

The location of the nearest private groundwater well is unknown; however, it is estimated to be within 0.25-radial miles of the Riverside property [3]. The number of persons who rely on private groundwater supplies located within 4-radial miles of the Riverside property was reported by CENTRACTS, which estimates groundwater populations using equal distribution calculations of U.S. Census CENTRACTS data identifying population, households, and private water wells for "Block Groups" that lie within or partially within individual radial distance rings measured from the Riverside property.

Table 6 describes the estimated drinking water population served by groundwater sources within 4-radial miles of the Riverside property.

**Table 6**

**Estimated Drinking Water Populations Served by Groundwater Sources  
Within 4-Radial Miles of Riverside Avenue Dump**

Radial Distance from Riverside Avenue Dump (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
≥ 0.00 to 0.25	3	0	3
> 0.25 to 0.50	7	0	7
> 0.50 to 1.00	0	0	0
> 1.00 to 2.00	12	0	12
> 2.00 to 3.00	139	0	139
> 3.00 to 4.00	335	220	555
<b>TOTAL</b>	<b>496</b>	<b>220</b>	<b>716</b>

[1; 2; 3; 15; 17; 32; 33; 34; 35; 36; 37]

Numerous monitoring wells have been installed on the property by WH&N during the environmental characterization work performed prior to development of the property. According to the 1989 NUS Trip Report, approximately 40 to 50 monitoring wells are present on the Riverside property [25].

Groundwater samples have been periodically collected by WH&N and analyzed primarily for VOCs and metals since 1986. Twice during this period (in 1987 and 1988), groundwater samples were also analyzed for SVOCs; however, no SVOCs were detected. In the 1987 PA, VT AEC reported that past groundwater samples indicated elevated levels of VOCs and several metals [13]. Analytical results of samples collected on 8 October 1986 during the WH&N Site Assessment indicated elevated levels of arsenic, bromoform, carbon tetrachloride, chlorobenzene, chromium, copper, iron, manganese, methylene chloride, nickel, and selenium. Additionally, on 8 March 1988, levels of methylene chloride as high as 20.9 parts per billion (ppb) were detected; however, this was suggested by WH&N to be the result of laboratory contamination [9].

In November 1988, groundwater samples were collected from three on-site monitoring wells by WH&N. These samples were analyzed for radiation (gross alpha, gross beta, tritium, and gamma). Results of these analyses revealed elevated levels of gross alpha [10.01 picocuries/liter (pCi/L)], gross beta (12.93 pCi/L), and tritium (175 pCi/L). All values are below Environmental Protection Agency (EPA) MCL values, but above the natural background concentration levels for the local area. The Vermont Department of Health reports background levels of gross alpha and gross beta radiation, natural to the Burlington area, to be 0.04 pCi/L and 0 pCi/L, respectively [24].

START did not perform any groundwater sampling as part of the Riverside property Site Inspection Prioritization (SIP). Groundwater samples have been collected by WH&N as discussed previously; however, samples have only been analyzed for VOCs, SVOCs, metals, and radiation. Based on analytical results from previous groundwater sampling events, groundwater beneath the property has been impacted by a release of hazardous substances which appears to be partially attributable to on-site sources. However, based on the location and distance from the property to residential and public wells, no nearby drinking water sources are known or suspected to have been impacted by the release from on-site sources. To date, no actions have been taken to address the release to groundwater.

## **SURFACE WATER PATHWAY**

Stormwater runoff enters the on-site stormwater drainage network through two retention/settling ponds which are located in the southeast corner of the property. Stormwater continues through a grass-lined swale across the property (over the former dump area). Upon reaching Hildred Road, the water flows through a culvert underneath the road and into a small retention basin. This basin contains a drain that is connected to a culvert that channels the water under Riverside Avenue and into the Winooski River [29].

The probable point of entry (PPE) for the Riverside property is the outfall pipe located along the Winooski River, approximately 500 feet north of the property. The Winooski River continues

approximately 10 miles before discharging into Lake Champlain. The flow rate of the Winooski River near Essex Junction (approximately 8 miles upstream of the PPE) is 1,728 cubic feet per second (cfs) based on U.S. Geological Survey (USGS) gauging station No. 04290500 [10]. The remaining 5 miles of the surface water pathway is an arc originating at the mouth of the Winooski River that encompasses the shoreline along Lake Champlain north to Colchester near Holy Cross Camp and south to Burlington Bay (Figure 3).

One drinking water intake is located within the surface water pathway. The BWD provides water to the City of Burlington and to Colchester Fire District No. 2. The BWD has a single surface water source located in Lake Champlain, at an approximate depth of 50 feet. The intake for the water supply is located in Burlington Bay, approximately 0.25 miles southwest of the northern portion of the breakwater. The intake is located approximately 14.5 miles downstream of the PPE. This system serves an estimated 53,600 people: 47,600 people in Burlington and 6,000 people in Colchester Fire District No. 2 [1; 15; 17; 42].

The CWC also has a surface water intake in Lake Champlain, although it is located beyond the 15-mile downstream surface water pathway [2]. This surface water intake is located approximately 16.8 miles downstream of the PPE.

Table 7 describes the 15-mile downstream surface water pathway.

**Table 7**

**Surface Water Bodies Along the 15-Mile Downstream Pathway  
from Riverside Avenue Dump**

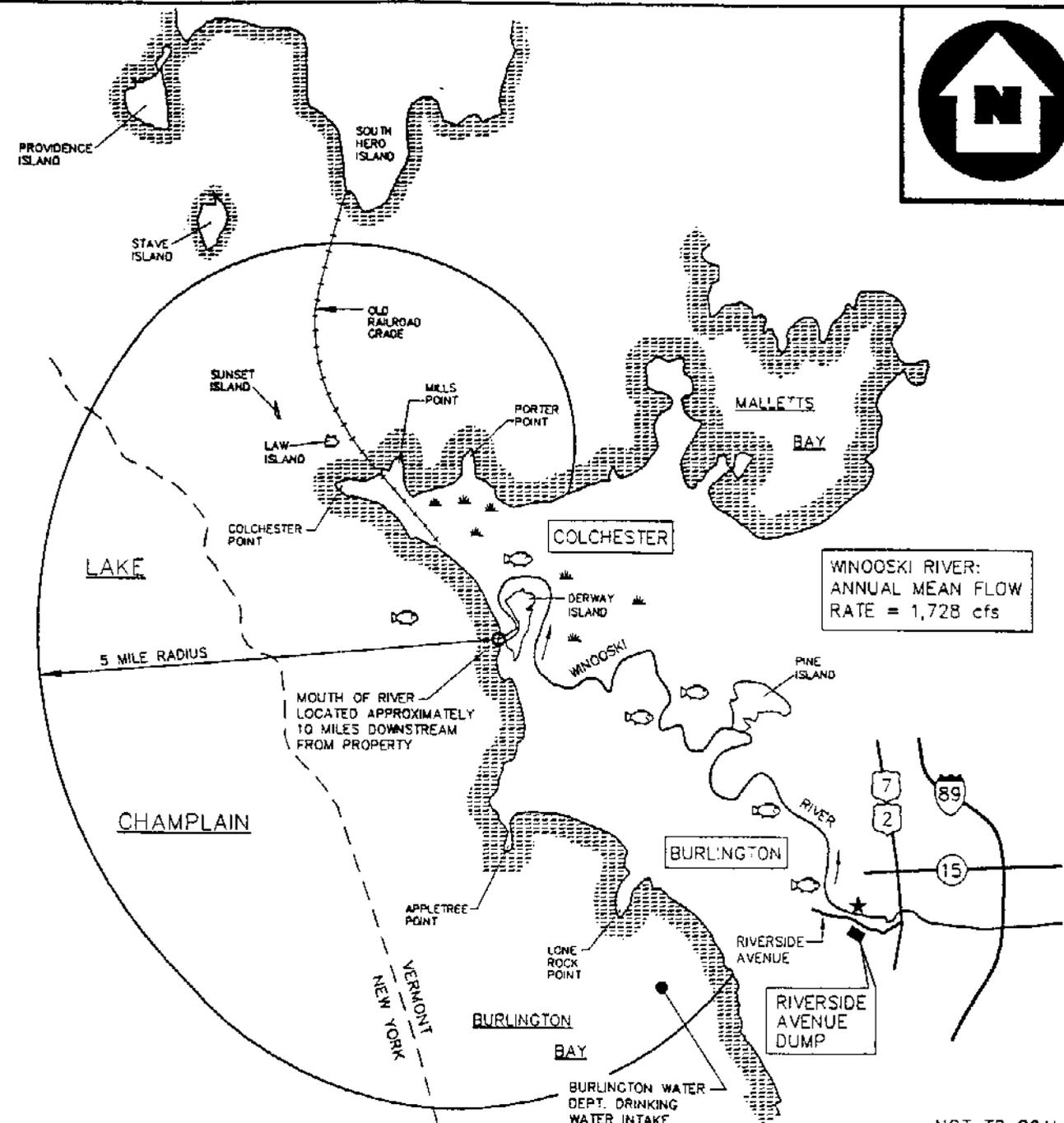
Surface Water Body	Descriptor <sup>a</sup>	Length of Reach (miles)	Flow Characteristics (cfs) <sup>b</sup>	Length of Wetlands (miles)
Winooski River	Large stream to river	10	1,728	4
Lake Champlain	Great Lake (deep)	5	NA	0

<sup>a</sup> Minimal stream <10 cfs. Small to moderate stream 10-100 cfs. Moderate to large stream >100-1,000 cfs. Large stream to river >1,000-10,000 cfs. Large river >10,000-100,000 cfs. Very large river >100,000 cfs. Coastal tidal waters (flow not applicable). Shallow ocean zone or Great Lake (flow not applicable). Moderate depth ocean zone or Great Lake (flow not applicable). Deep ocean zone or Great Lake (flow not applicable). Three-mile mixing zone in quiet flowing river 10 cfs or greater.

<sup>b</sup> Cubic feet per second.  
NA = Not applicable.

[10; 18; 32; 33; 34; 35; 36; 37; 38; 39; 40; 41]

Table 8 describes the drinking water intakes along the 15-mile downstream pathway from the Riverside property.



WINOOSKI RIVER:  
ANNUAL MEAN FLOW  
RATE = 1,728 cfs

NOT TO SCALE

**LEGEND**

- ▲ WETLANDS
- ★ PROBABLE POINT OF ENTRY TO SURFACE WATER
- 🐟 FISHERY
- FLOW DIRECTION
- cfs CUBIC FEET PER SECOND
- - - STATE LINE
- ▨ SURFACE WATER

SOURCE: U.S.G.S. QUADRANGLE(S):  
COLCHESTER POINT, VT-NY, 1966, PHOTOREVISED 1972.  
COLCHESTER, VT, 1948, PHOTOREVISED 1987.  
BURLINGTON, VT, 1948, PHOTOREVISED 1987.  
WILLSBORO BAY, VT-NY, 1980.

SURFACE WATER PATHWAY

RIVERSIDE AVENUE DUMP  
RIVERSIDE AVENUE  
BURLINGTON, VERMONT



REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDO # 98-05-0163	DRAWN BY: W. SHAW	DATE 4/22/98
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FILE NAME: S:\98020010\FIG3	FIGURE 3
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**Table 8**

**Drinking Water Intakes Along the 15-Mile Downstream Pathway from Riverside Avenue Dump**

Intake Name	Surface Water Body	Downstream Distance from PPE (miles)	Flow Rate at Intake (cfs) <sup>a</sup>	Estimated Population Served
BWD intake	Lake Champlain	14.5	NA	53,600

<sup>a</sup> Cubic feet per second

PPE = Probable point of entry.

BWD = Burlington Water Department.

NA = Not applicable.

[1; 15; 17; 42]

According to the VT DEC, the Lake Sturgeon is the only State-endangered species along the 15-mile downstream surface water pathway. Based on U.S. Department of Interior (US DOI) wetland maps, an estimated 4 miles of wetlands are located along the Winooski River portion of the 15-mile downstream surface water pathway.

Table 9 lists sensitive environments along the 15-mile downstream surface water pathway from Riverside Avenue Dump.

**Table 9**

**Sensitive Environments Along the 15-Mile Downstream Pathway from Riverside Avenue Dump**

Sensitive Environment Name	Sensitive Environment Type	Surface Water Body	Downstream Distance from PPE (miles)	Flow Rate at Environment (cfs) <sup>a</sup>
Clean Water Act	Clean Water Act	Winooski River	0	1,728
Lake Sturgeon	State-Endangered Habitat	Winooski River	0 to 10	1,728
Wetlands	Wetlands (4 miles)	Winooski River	0 to 10	1,728

<sup>a</sup> Cubic feet per second

PPE = Probable Point of Entry

[18; 38; 39; 40; 41]

On 25 August 1983, the VT DEC Air and Solid Waste Program collected five surface water samples from a variety of locations associated with the Riverside property to identify the potential

impact on surface water by the solid waste buried at the Riverside property. Samples were analyzed for metals only. One of these samples was reportedly collected from the "stream discharge". START assumes that this sample was collected from the area adjacent to the discharge culvert leading to the Winooski River. This sample was collected from an area described as a large, bright orange, foamy-leachate seep that appeared to contain raw sewage. Results of this analysis indicated elevated levels of iron, lead, manganese, and nickel [14]. The exact locations of the remaining samples are unknown; therefore, START has not evaluated these samples due to a lack of information regarding sample locations.

In September 1986, WH&N reported to the VT DEC that they had observed a culvert pipe along the south bank of the Winooski River which terminated about 10 feet above the water. WH&N observed leachate discharging from the pipe into the river and reported a strong unpleasant odor associated with the leachate [21].

On 8 December 1989, NUS completed an SI for the Riverside property. During the on-site reconnaissance, it was observed that leachate was entering the Winooski River from a culvert that originated on the Riverside property [8].

In September 1990, Stormwater Discharge Permit No. 1-0961 was issued to the 286 Riverside Avenue Project (Larkin Realty) by VT DEC. However, no monitoring was required as a condition of this permit [30;31; 45].

On 19 May 1998, START personnel collected six sediment samples (SD-01 through SD-06) from the banks of the Winooski River. The sample locations were chosen to evaluate whether a release to the surface water pathway has occurred. Samples were analyzed for VOCs, SVOCs, pesticide/PCBs, and inorganics (metals and cyanide).

Sediment samples SD-01 through SD-06 were collected along the Winooski River. Sediment samples were collected from areas upstream and downstream of the culvert, which is the point of discharge for the Riverside property stormwater drainage network. Reference samples (SD-01 and SD-02) were collected from an area approximately 170 feet upstream of the culvert. START personnel noted that sediment sample SD-03, collected near the culvert outfall pipe, was covered by a thin layer of orange silt and had a moderate odor. Sediment samples SD-04 and SD-05 were collected approximately 245 feet downstream of the culvert, and sediment sample SD-06 was collected approximately 650 feet downstream of the culvert.

Table 10 summarizes the locations and characteristics of the samples collected by START on 19 May 1998.

Table 10

Sample Summary: Riverside Avenue Dump  
Sediment Samples Collected by START on 19 May 1998

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (Inches)	Sample Source
<b>MATRIX: Sediment</b>					
SD-01	DAFQ35	1130	Grab	6 to 18	Sediment sample collected approximately 170 feet upstream of the culvert outfall pipe, in order to establish reference conditions. Material is a medium-to-fine, gray, sandy clay. No organic material was observed.
SD-02	DAFQ36	1130	Grab	6 to 18	Duplicate of SD-01, collected for quality control (metals only).
SD-03 (MS/MSD)	DAFQ37	1150	Grab	6 to 18	Sediment sample collected from the PPE (location of the culvert outfall pipe) to determine the existence of potential contamination in the river. Material is a medium-to-fine, gray to brown, sandy clay. Material was covered by a layer of orange silt. No organic material was observed.
SD-04	DAFQ38	1210	Grab	6 to 18	Sediment sample collected approximately 245 feet downstream of the culvert outfall pipe, in order to determine the existence of potential contamination in the river. Material is a medium-to-fine, gray, sandy clay. No organic material was observed.
SD-05	DAFQ39	1210	Grab	6 to 18	Duplicate of SD-04, collected for quality control.
SD-06	DAFQ40	1225	Grab	6 to 18	Sediment sample collected approximately 650 feet downstream of the culvert outfall pipe, in order to determine the existence of potential contamination in the river. Material is a dark brown, fine sandy clay. Some organic material was observed.

- MS/MSD = Matrix spike/Matrix spike duplicate.
- NA = Not applicable.
- VOCs = Volatile organic compounds.
- SVOCs = Semivolatile organic compounds.
- PCBs = Polychlorinated biphenyls.
- PPE = Probable point of entry.

Table 11 is a summary of organic compounds and inorganic elements detected through Delivery of Analytical Services (DAS) analyses of START sediment samples. For each sample location,

a compound or element is listed if it is detected at three times or greater than the reference sample concentration (SD-01 or SD-02). However, if the compound or element is not detected in the reference sample, the reference sample's sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Complete analytical results of START sediment samples including quantitation and detection limits are presented in Attachment A. Sample results quantified with a "J" on analytical tables are considered approximate because of limitations identified during DAS data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

**Table 11**  
**Summary of Analytical Results**  
**Sediment Sample Analysis for Riverside Avenue Dump**

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SD-03 (DAFQ37)	<b>SVOCs</b>			
	Phenanthrene	79 J $\mu\text{g}/\text{kg}$	10 J $\mu\text{g}/\text{kg}$	7.9 $\times$ Ref
	Anthracene	20 J $\mu\text{g}/\text{kg}$	4 J $\mu\text{g}/\text{kg}$	5.0 $\times$ Ref
	Fluoranthene	170 J $\mu\text{g}/\text{kg}$	16 J $\mu\text{g}/\text{kg}$	10.6 $\times$ Ref
	Pyrene	150 J $\mu\text{g}/\text{kg}$	17 J $\mu\text{g}/\text{kg}$	8.8 $\times$ Ref
	Benzo(a)anthracene	74 J $\mu\text{g}/\text{kg}$	8 J $\mu\text{g}/\text{kg}$	9.3 $\times$ Ref
	Chrysene	87 J $\mu\text{g}/\text{kg}$	9 J $\mu\text{g}/\text{kg}$	9.7 $\times$ Ref
	<b>PESTICIDES/PCBs</b>			
4,4' - DDT	13 J $\mu\text{g}/\text{kg}$	4.3 U $\mu\text{g}/\text{kg}$	3.0 $\times$ SQL	
SD-04 (DAFQ38)	<b>SVOCs</b>			
	Phenanthrene	140 J $\mu\text{g}/\text{kg}$	10 J $\mu\text{g}/\text{kg}$	14 $\times$ Ref
	Anthracene	52 J $\mu\text{g}/\text{kg}$	4 J $\mu\text{g}/\text{kg}$	13 $\times$ Ref
	Fluoranthene	230 J $\mu\text{g}/\text{kg}$	16 J $\mu\text{g}/\text{kg}$	14.4 $\times$ Ref
	Pyrene	240 J $\mu\text{g}/\text{kg}$	17 J $\mu\text{g}/\text{kg}$	14.1 $\times$ Ref
	Benzo(a)anthracene	130 J $\mu\text{g}/\text{kg}$	8 J $\mu\text{g}/\text{kg}$	16.3 $\times$ Ref
Chrysene	160 J $\mu\text{g}/\text{kg}$	9 J $\mu\text{g}/\text{kg}$	17.8 $\times$ Ref	

**Table 11**

**Summary of Analytical Results  
Sediment Sample Analysis for Riverside Avenue Dump (Concluded)**

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SD-05 (DAFQ39)	<b>SVOCs</b>			
	Phenanthrene	140 J $\mu\text{g}/\text{kg}$	10 J $\mu\text{g}/\text{kg}$	14 $\times$ Ref
	Anthracene	35 J $\mu\text{g}/\text{kg}$	4 J $\mu\text{g}/\text{kg}$	8.8 $\times$ Ref
	Fluoranthene	340 J $\mu\text{g}/\text{kg}$	16 J $\mu\text{g}/\text{kg}$	21.3 $\times$ Ref
	Pyrene	360 J $\mu\text{g}/\text{kg}$	17 J $\mu\text{g}/\text{kg}$	21.1 $\times$ Ref
	Benzo(a)anthracene	180 J $\mu\text{g}/\text{kg}$	8 J $\mu\text{g}/\text{kg}$	22.5 $\times$ Ref
	Chrysene	220 J $\mu\text{g}/\text{kg}$	9 J $\mu\text{g}/\text{kg}$	24.4 $\times$ Ref
SD-06 (DAFQ40)	<b>SVOCs</b>			
	Phenanthrene	93 J $\mu\text{g}/\text{kg}$	10 J $\mu\text{g}/\text{kg}$	9.3 $\times$ Ref
	Anthracene	22 J $\mu\text{g}/\text{kg}$	4 J $\mu\text{g}/\text{kg}$	5.5 $\times$ Ref
	Fluoranthene	180 J $\mu\text{g}/\text{kg}$	16 J $\mu\text{g}/\text{kg}$	11.3 $\times$ Ref
	Pyrene	180 J $\mu\text{g}/\text{kg}$	17 J $\mu\text{g}/\text{kg}$	10.6 $\times$ Ref
	Benzo(a)anthracene	87 J $\mu\text{g}/\text{kg}$	8 J $\mu\text{g}/\text{kg}$	10.9 $\times$ Ref
	Chrysene	120 J $\mu\text{g}/\text{kg}$	9 J $\mu\text{g}/\text{kg}$	13.3 $\times$ Ref

- Ref = Reference value.
- J = Quantitation is approximate due to limitations identified during the quality control review.
- U = Indicates the sample was analyzed but not detected and reports the detection value.
- $\mu\text{g}/\text{kg}$  = Micrograms per kilogram (i.e. parts per billion).
- PCBs = Polychlorinated biphenyls.
- VOCs = Volatile organic compounds.
- SVOCs = Semivolatile organic compounds.
- SQL = Sample Quantitation Limit.

[47; 48; 49]

No elevated levels of VOCs or inorganics (metals or cyanide) were detected in sediment samples collected from the Winooski River [47; 48; 49].

Six SVOCs were detected at elevated levels in sediment samples collected from the Winooski River. The substances and their maximum concentrations include the following: anthracene [52 J micrograms per kilogram ( $\mu\text{g}/\text{kg}$ )], benzo(a)anthracene (180 J  $\mu\text{g}/\text{kg}$ ), chrysene

(220 J  $\mu\text{g}/\text{kg}$ ), fluoranthene (340 J  $\mu\text{g}/\text{kg}$ ), phenanthrene (140 J  $\mu\text{g}/\text{kg}$ ), and pyrene (360 J  $\mu\text{g}/\text{kg}$ ) [47; 48; 49].

One pesticide was detected in sediment samples at 13 J  $\mu\text{g}/\text{kg}$ , approximately three times greater than the reference sample's SQL [47; 48; 49].

It is unknown whether these substances are attributable to the Riverside property as they have not been previously detected in the landfill.

In 1983, VT DEC collected surface water samples from the Riverside property. The sample locations are unclear; however, START is presuming the samples were collected from the stormwater drainage network. In addition, on 19 May 1998, START collected sediment samples from the Winooski River as part of the Riverside property SIP. No other samples are known to have been collected directly from the Winooski River in association with the Riverside property. Based on the observation of leachate entering the Winooski River via the stormwater culvert, a release of hazardous substances from on-site sources to the Winooski River has been documented. If START sediment sampling results are determined to be attributed to the Riverside property, a Clean Water Act-protected water body, a State-endangered habitat, and a fishery will be impacted. No other sensitive environments are known or suspected to have been impacted. To date, no known actions have been taken to address the release to the Winooski River.

## SOIL EXPOSURE PATHWAY

Two housing complexes are built on the former Riverside property: one complex is operated by Riverwatch and includes 215 condominium units in nine buildings; the other is managed by BHA and includes 26 apartments in 13 buildings. START estimates that two people reside in each apartment; therefore, an estimated 482 people live on the Riverside property [9; 19; 27; 29].

An estimated 21,556 people live within 1-radial mile of the Riverside property [3]. No known terrestrial sensitive environments are located on the Riverside property. There are no schools or day-care facilities located within 200 feet of identified source areas on the property; however, Trinity College is located adjacent to the eastern property boundary. Pedestrian and vehicular access to the Riverside property is unrestricted.

Soil samples were collected from the Riverside property in 1987 and 1988 by WH&N. All samples were collected from depths between 1 and 2 feet and analyzed for purgeable halocarbons and aromatics, and for SVOCs. Analytical results of samples indicated the detection of a variety of VOCs, including chloroform (9.17  $\mu\text{g}/\text{kg}$ ), methylene chloride [21.1 micrograms per liter ( $\mu\text{g}/\text{L}$ )], 1,1,1-trichloroethane (8.8  $\mu\text{g}/\text{L}$ ), and tetrachloroethylene (PCE) (2.6  $\mu\text{g}/\text{L}$ ). No elevated levels of SVOCs were detected [9].

The landfill is currently capped with a minimum of 2 feet of clay [16; 29]. Due to the cap, START does not consider the above-mentioned substances to be available to soil exposure targets.

START did not perform surface soil sampling as part of the Riverside property SIP. Based on the available file information and the presence of a cap, no release of hazardous substances to surficial soils from on-site sources has been documented.

## AIR PATHWAY

No known air samples have been collected from the Riverside property to date. The nearest individuals to the property are the approximately 482 people that live in homes built on the property [29]. An estimated 62,972 people live within 4-radial miles of the Riverside property [3]. Table 12 summarizes the residential population located within 4-radial miles of the Riverside property.

**Table 12**

### **Estimated Population Within 4-Radial Miles of Riverside Avenue Dump**

Radial Distance from Riverside Avenue Dump (miles)	Estimated Population
On a Source	482
> 0.00 to 0.25	2,228
> 0.25 to 0.50	6,588*
> 0.50 to 1.00	14,040
> 1.00 to 2.00	17,199
> 2.00 to 3.00	11,562
> 3.00 to 4.00	12,199
<b>TOTAL</b>	<b>64,298*</b>

\* This value includes the 1,300 students enrolled at Trinity College.

[3]

The nearest school, Trinity College on Pearl Street, is located adjacent to the eastern boundary of the Riverside property and has an enrollment of 1,300 students [5]. No known sensitive environments are located on the property. According to the VT DEC, there is one Federally-threatened species and 20 habitats utilized by State-threatened or endangered species located within 4-radial miles of the Riverside property. Based on US DOI Wetland Inventory maps, there are approximately 1,248 acres of wetlands within 4-radial miles of the Riverside property [18; 38; 39; 40; 41].

During the 14 April 1998 START on-site reconnaissance, no levels above background were detected in ambient air utilizing a FID; however, readings exceeding 1,000 units above background were recorded adjacent to the exhaust vents for the methane barrier system [29].

Table 13 summarizes sensitive environments located within 4-radial miles of Riverside Avenue Dump.

**Table 13**

**Sensitive Environments Located Within 4-Radial Miles of Riverside Avenue Dump**

Radial Distance from Riverside Avenue Dump (miles)	Sensitive Environment/Species (status)
> 0.00 to 0.25	Clean Water Act
	Habitat for Two State Threatened or Endangered Species
> 0.25 to 0.50	4 acres of wetlands
> 0.50 to 1.00	95 acres of wetlands
	Habitat for One State Threatened Species
> 1.00 to 2.00	190 acres of wetlands
	Habitat for One Federal Threatened Species
	Habitat for Two State Threatened or Endangered Species
> 2.00 to 3.00	390 acres of wetlands
	Habitat for Six State Threatened Species
> 3.00 to 4.00	569 acres of wetlands
	Habitat for Nine State Threatened or Endangered Species

[18; 38; 39; 40; 41 50]

No laboratory quantitative air samples are known to have been collected from the Riverside property. Based on the available data, no release of hazardous substances to the ambient air from on-site sources is known or suspected to have occurred, and no impacts to nearby residential populations or sensitive environments are known or suspected.

## SUMMARY

The Riverside Avenue Dump (Riverside) property is located at 286 Riverside Avenue in Burlington, Chittendon County, Vermont. The residentially zoned property consists of 20 acres and is jointly owned and managed by the Riverwatch Condominium Association (Riverwatch), Larkin Realty (Larkin), and the Burlington Housing Authority (BHA). The property is bordered by Riverside Avenue and the Winooski River to the north, Trinity College to the east, homes and woods to the south, Hillside Terrace and other BHA houses to the west. Currently the property consists of two housing developments: one, which is managed by BHA, consists of 26 apartments in 13 houses; and the second, which is managed by Riverwatch, consists of 215 apartments in nine buildings.

Landfill operations began at Riverside in 1950 when the City of Burlington leased the property on Riverside Avenue from Mr. Thomas Reeves. Between the years of 1950 and 1961, the landfill received both industrial and municipal waste. The dump was closed in 1961 when a new landfill was opened on Manhattan Drive in Burlington. During the years of 1979 and 1980, Riverside accepted sewage treatment sludge from the Burlington wastewater treatment plants. This sludge was confined to an area of approximately 0.5 acres. No records were kept documenting the specific substances that were disposed of in the landfill; however, based on known wastes generated by companies that were documented to have sent their wastes to the landfill, the types of wastes can be inferred to include the following: paint sludges, excess paints and thinners, waste solvents, solvent-soaked rags, cyanide compounds, barium chloride salts, corrosives, waste oils, solvent-based inks, and petroleum-based inks. Other wastes that were known to have been disposed of in the Riverside landfill include coal tar sludge, ferric chloride, hospital wastes (allegedly comprised of low-level radioactive wastes), and gasoline-spill cleanup debris.

Groundwater is estimated to flow north, toward the Winooski River, at depths ranging from 2.5 to 53.6 feet. One public well is located approximately 3.1 miles southwest of the Riverside property. Approximately 716 people are served by groundwater sources located within 4-radial miles of the Riverside property.

In September 1986, Wagner, Heindel, and Noyes (WH&N) reported to the Vermont Department of Environmental Conservation (VT DEC) that they had observed a culvert pipe along the south bank of the Winooski River which terminated about 10 feet above the water line. WH&N observed leachate discharging from the pipe into the river and reported an odor associated with the leachate.

Currently, stormwater runoff enters the on-site stormwater drainage network through two retention/settling ponds which are located in the southeast corner of the property. Stormwater continues through a grass-lined swale across the property. Upon reaching Hildred Road, the water flows through a culvert underneath the road and into a small retention basin/catch basin. This basin contains a drain that is connected to a culvert that channels the water under Riverside Avenue and then into the Winooski River. The probable point of entry (PPE) for the Riverside property is the outfall pipe located along the Winooski River approximately 500 feet north of the property. The Winooski River continues approximately 10 miles before discharging into Lake Champlain. The remainder of the surface water pathway is limited to Lake Champlain.

One drinking water intake is located within the surface water pathway. The Burlington Water Department (BWD) has a single surface water source located in Lake Champlain, at an approximate depth of 50 feet, that serves an estimated 53,600 people. The intake for the water supply is located in Burlington Bay, approximately 0.25 miles southwest of the northern portion of the breakwater, approximately 14.5 miles downstream of the PPE.

According to the Vermont Department of Environmental Concern (VT DEC) (formerly VT AEC), the Lake Sturgeon is the only State endangered species along the 15-mile downstream surface water pathway. In addition, based on U.S. Department of Interior (US DOI) wetland maps, an estimated 4 miles of wetlands are located along the Winooski River portion of the 15-mile downstream surface water pathway.

On 25 August 1983, the VT DEC Air and Solid Waste Program collected five surface water samples from the Riverside property to identify the potential impact on surface water by the solid waste buried at the Riverside property. One of these samples was reportedly collected from the stream discharge. This sample was collected from an area described as a large, bright orange, foamy-leachate seep that appeared to contain raw sewage. Results of this analysis indicated elevated levels of iron, lead, manganese, and nickel.

On 19 May 1998 START personnel collected six sediment samples (SD-01 through SD-06) from the banks of the Winooski River. The sample locations were chosen to evaluate whether a release to the surface water pathway has occurred. Six semivolatile organic compounds (SVOCs) were detected at elevated levels in sediment samples collected from the Winooski River. The substances include the following: anthracene, benzo(a)anthracene, chrysene, fluoranthene, phenanthrene, and pyrene. One pesticide was also detected in sediment samples. No elevated levels of volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), or inorganic (metals or cyanide) were detected in sediment samples collected from the Winooski River. It is unknown whether these substances are attributable to the Riverside property as they have not been previously detected at the landfill.

The nearest individuals to the property are the approximately 482 people that live in homes built on the property. No known sensitive environments are located on the property. Pedestrian and vehicular access to the Riverside property is unrestricted. Soil samples were collected from the Riverside property in 1987 and 1988 by WH&N. All samples were collected from depths between 1 and 2 feet and analyzed for purgeable halocarbons and aromatics, and for SVOCs. Analytical results of samples indicated elevated levels of chloroform, methylene chloride, 1,1,1-trichloroethane, and tetrachloroethylene.

An estimated 62,972 people live within 4-radial miles of the Riverside property. The nearest school, Trinity College, is located adjacent to the eastern boundary of the Riverside property and has an enrollment of 1,300 students. According to the VT DEC, there is one Federally threatened species and 20 habitats utilized by State threatened or endangered species located within 4-radial miles of the Riverside property. Based on US DOI Wetland Inventory maps, there are approximately 1,248 acres of wetlands within 4-radial miles of the Riverside property.

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