BINKERD ENVIRONMENTAL
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APR 29 10 29 AM '97
WASTE MANAGEMENT

Monday, April 28, 1997

Mr. Andrew Shively
State of Vermont
Sites Management Section
Waste Management Division
103 South Main Street
Waterbury, VT 05671-0404

Dear Mr. Shively:

Subject: ESA - Burlington News Agency, Facility ID#1417

BINKERD ENVIRONMENTAL is pleased to submit to you, on behalf of the Burlington News Agency, Inc., the Environmental Site Assessment Report related to the removal of two underground storage tanks at the Burlington News Agency, 11 Hercules Drive, Colchester, Vermont.

If you have any questions, please call me. Thank you.

Sincerely,
BINKERD ENVIRONMENTAL

Roger C. Binkerd

Roger C. Binkerd, P.E.
President

Enclosure (1)
cc with enclosure: Mr. Brian Todd Murphy, Burlington News Agency

BINKERD ENVIRONMENTAL
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Environmental Site Assessment Related to UST Closure at the Burlington News Agency 11 Hercules Drive, Colchester, VT Facility ID# 1417

APR 29 10 29 AM '97

#96-2119

Prepared for:
Burlington News Agency, Inc.
11 Hercules Drive
Colchester, Vermont 05446

Prepared by:
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BINKERD ENVIRONMENTAL - Project Number 97002

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SUMMARY

In 1986, two underground storage tanks were installed on property owned by Burlington News Agency. Approximately ten years later, on 13 November 1996, both tanks were removed by T. L. Boise Excavating, Inc. and a closure inspection was conducted by ***BINKERD ENVIRONMENTAL.*** The tanks were in excellent condition and no leaks from the tanks were observed; however, soils analyzed with a field photoionization detector exceed state guidelines for fuel oils.

The Sites Management Section (SMS) of the Vermont Agency of Natural Resources, Waste Management Division determined that additional work is necessary at the site in order to determine the severity of the contamination present.

On 28 March 1997 a field investigation was conducted that included five soils borings surrounding the location of the removed underground storage tanks. The first boring was at the edge of the excavation. A temporary well was installed and sampled at this location. A groundwater sample from this well was screened at ITS Environmental Laboratories (ITS) in Colchester on 28 March 1997. The results from that screening were available by 9:30 AM on 28 March 1997. No BETX compounds were detected in the groundwater sample. One compound was detected at a very low level and was tentatively identified as MTBE (Methyl tert-Butyl Ether), a compound added to gasoline. This result was later confirmed; MTBE in this water sample was determined to be 12 micrograms per liter (ug/l).

Based on the screening result of the water sample, the results of field screening of soils recovered in the borings with a photoionization detector, and the on site inspection of the soil conditions, four additional borings were completed surrounding the excavation. These four borings were advanced into an impeding layer of compact silt. Soils were screened from each core with a PID. Soil samples were collected from two of the borings and submitted to ITS for BETX and MTBE analysis according to U.S. EPA method 8100. No compounds in soils were detected above the method detection limits.

There does not appear to be a demonstrated risk to human health or the environment. This conclusion is based on the lack of contamination observed on site and the lack of a viable pathway for exposure to humans or the environment.

The soil stockpiled in the back of the site should be monitored. When PID readings are less than 10 ppm, the soil pile should be spread on site. After this is accomplished and documented, it is the opinion of ***BINKERD ENVIRONMENTAL*** that the Burlington News Agency site should be designated by the State Sites Management Section as "closed" and that no additional work should be required.

1. INTRODUCTION

This report was prepared by ***BINKERD ENVIRONMENTAL*** for the Burlington News Agency, Inc. The Burlington News Agency is owned and operated by Mr. Thomas F. Murphy. The representative for the Burlington News Agency on environmental issues related to this investigation is Mr. Brian Todd Murphy. Mr. Murphy can be reached at (802) 655-7000.

In 1986 two underground storage tanks were installed on property owned by Burlington News Agency. Approximately ten years later, on 13 November 1996, both tanks were removed by T. L. Boise Excavating, Inc. and a closure inspection was conducted by ***BINKERD ENVIRONMENTAL***.[1] The tanks were found to be in excellent condition and no leaks from the tanks were observed.

Soils excavated from the pit were separated into four piles. Soil samples were collected from each pile and in the pit below the tanks and analyzed on site with a photoionization detector (PID) using the states headspace method. One pile, with an average PID reading of 175 ppm was clearly well above the state guideline of 10 ppm for soil contaminated with diesel fuel and 20 ppm for gasoline. This pile was stockpiled. One pile had an average PID reading that was equal to background soil PID readings and was clearly not contaminated. The other two piles and the pit below the tanks had PID average readings of 16, 20 and 15 ppm, respectively. Both piles and the one reading taken in the pit exceeded the state guideline for diesel fuel. Since the soil in the pit exceeded the guideline for diesel fuel, the extend of contamination was unknown. Sites Management Section (SMS) of the Vermont Agency of Natural Resources, Waste Management Division determined that additional work is necessary at the site in order to determine the severity of the contamination present. [2] The SMS requested that:

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1 Closure report dated 16 November 1996. Submitted on behalf of Burlington News Agency to Department of Environmental Conservation, Waste Management Division.
2 Letter dated 13 February 1997 from Mr. Chuck Schwer, Supervisor, Sites Management Section to Mr. Brian Todd Murphy.

- Further define the degree and extent of contamination to the soil. This may be accomplished by obtaining soil borings, digging test pits, performing a soil gas survey or another method approved by the SMS. If soils are found to contain evidence of contamination at the water table, then a sufficient number of monitoring wells should be installed at location(s) which will adequately define the severity of contamination at the site. All groundwater samples should be analyzed for BTEX, MTBE and TPH compounds.

- Perform an assessment of the site to determine the potential for sensitive receptors to be impacted by the contamination. This should include basements of adjacent buildings, nearby surface water, and any public or private drinking water wells which are located within the vicinity of the site. If any water supplies appear to be at risk from this contamination, they should be sampled and analyzed for BETX, MTBE and TPH compounds.

- Determine the need for a long term treatment and/or monitoring plan which addresses the contamination present at the site. The need for such a plan should be based on the results of the above investigation.

- Develop a plan to treat and/or monitor the 22 cubic yards of stockpiled soils. The soils must remain located in an area such that they have a low potential to impact nearby receptors. They must remain properly encapsulated in plastic.

- Submit to the SMS a summary report which outlines the work performed, as well as provides conclusions and recommendations. Included should be analytical data, a detailed site map showing the location of any potential sensitive receptors, an area map, and if monitoring wells are installed, detailed well logs and a groundwater contour map.

On 27 February 1997, the SMS was notified of Burlington News Agency's decision to participate in the expressway program and submitted a "Site Investigation Expressway Notification" form.[3]

This report documents the results of the environmental site assessment conducted to satisfy the above requests.

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3 Letter date 27 February 1997 from Mr. Roger C. Binkerd, ***BINKERD ENVIRONMENTAL***, to Mr. Andrew Shively, SMS.

2.0 SITE BACKGROUND

2.1 Site Location

The Burlington News Agency property and place of business can be accessed by leaving Interstate 89 at Exit 16, Figure 1. At the end of the exit ramp, turn north on Route 2 and 7. This road is also named Roosevelt Highway. The Burlington News Agency is in the Ethan Allen Industrial Park located to the east side of Roosevelt Highway. To enter the Ethan Allen Industrial Park go to the second set of traffic lights and take a right onto Hercules Drive. The Burlington News Agency has a sign along the right hand side of Hercules Drive. The Burlington News Agency can also be accessed by turning right onto Mountain View Road, at the first set of traffic lights, and driving through the parking lot adjacent to Costco Wholesale Company, and then left onto Hercules Drive. Burlington News Agency is on the left.

2.2 General Site Description

The Burlington News Agency is located in a commercially zoned area of Colchester, Vermont and is surrounded by other business. Water is supplied to the Burlington News Agency and all surrounding properties by the Champlain Water District. The building owned by Mr. Thomas (Todd) F. Murphy is occupied by two tenants: the north section is occupied by Dynastar, the south section is occupied by the Burlington News Agency. There are no residences adjacent to the Burlington News Agency property. The closest residence is on property owned by Mr. Daniel E. Mendl at the corner of Roosevelt Highway (Route 7 & 2) and Mountain View Road. This intersection is the main entrance to COSTCO Wholesale Company. Figure 3 is a copy of the property tax map for the Town of Colchester showing adjacent and surrounding property owners.

To the north of the Burlington News Agency is Champlain Cable Company owned by Haveg Industries, Inc., Figure 4. This property is listed on the "Vermont Hazardous Sites List" number 770046. This site has been the subject of extensive environmental investigations due to the past improper disposal of solvents used in the their manufacturing process. According to the sites list the status of this site is that pilot testing of remedial design is ongoing. This site is down-gradient of Burlington News Agency.

Green Mountain Power Company has a substation and the Town of Colchester has a wastewater pump station in adjacent to the northwest portion of the property. The adjacent property to the northwest is owned by Bartletts Bay Company. This property is occupied by Polhemus.

Cynosure, Inc. owns the property to the west and to the south of the Burlington News Agency. The property to the west is occupied by Chucks Heating and Air Conditioning. The property to the south is occupied by VH&V, Inc, Quality Air Control, Inc. Signature, Inc. (electric signs), Network Performance, and Fab-Tech.

The property across Hercules Drive to the east is owned by the United States of America and is a vacant and unused portion of Camp Johnson.

2.3 Site History

2.3.1 Ownership History

The site history was documented by interviews with Mr. Brian Todd Murphy, land records title search at Town of Colchester, and site visits. The recorded land title records were searched from the present owner to 1949 and are described in Table 1. The property was obtained by the Greater Burlington Industrial Corporation (GBIC) in 1964 from the United States of America. GBIC sold the land to Skis Dynastar, Inc. in 1964. Mr. Murphy brought the property in 1986. The building on the property is occupied by Skis Dynastar, Inc. and the Burlington News Agency.

Table 1. Recorded Land Title Records					
Property Address: Burlington News Agency, 11 Hercules Drive, Colchester, VT					
Records Located at: Colchester Town Hall					
Search Conducted by: Roger C. Binkerd					
Date of Search: April 1997					
Book	Pages	Grantor	Grantee	Date	Notes
119	233-235	Skis Dynastar, Inc.	Thomas F. Murphy	8/25/86	Ethan Allen Indstrial Park
31	445-448	Greater Burlington Industrial Corporation (GBIC)	Skis Dynastar, Inc.	9/2/77	
3	395	United States of America	Greater Burlington Industrial Corporation (GBIC)	1/6/64	
3	19	U.S. District Court; Case No. 331; George F. Meunier and Delia Meunier	Quit Claim; United States of America	1949	Condemnation Proceedings; Chittenden County Registry of Deeds; Federal Property and Administrative Property Act of 1949

2.3.2 Manufacturing History

The building occupied by the Burlington News Agency (south portion) and Ski Dynastar (north portion) was originally entirely occupied by Ski Dynastar, Figure 6. Ski Dynastar manufactures skis. Solid waste produced in the manufacturing of skis is disposed of off site.[4] The Burlington News Agency distributes magazines throughout Vermont and upper state New York. Unsold magazines are collected and returned to the Burlington News Agency facility for recycling.

The former underground storage tanks for diesel and gasoline were installed in 1986 to provide fuels to the fleet of trucks and cars used in the distribution and collection of magazines.

4 Telephone interview with Mr. Todd Murphy, 18 April 1997.

2.4 Previous Site Investigations

A site investigation was conducted by *BINKERD ENVIRONMENTAL* on 13 November 1996 related to the closure of two underground tanks; a 1000 gallon diesel tank and a 2000 gallon gasoline tank. Both tanks were in excellent condition when inspected after removal from the ground. Neither tank had leaked.

Soils removed from the pit during the removal of the two tanks were placed in four separate piles. Soil samples were collected from each pile for field screening using a PID. Odors were not observed from three of the soil piles or from the pit. Odors were noticeable from one pile, pile C. Soils contained in Pile C were excavated from directly under the raised concrete island that was the platform for the gasoline and diesel fuel pumps. The soil in pile C was excavated from the top of the two underground storage tanks. Soil in pile C, about 22 cubic yards with an average PID reading of 150 parts per million, ppm, were polyencapsulated on site. Soils from piles A, B and D, about 27.5 cubic yards with an average PID readings of background, 20 and 15 ppm, respectively, were returned to the pit. A soil sample from the bottom of the pit was 15 ppm.

Pile C clearly exceeded the State guideline of 10 ppm for diesel and 20 ppm for gasoline as the level for contaminated soils. Two of the three piles and the pit exceeded the State guideline for diesel fuel. Soils in the three remaining piles were returned to the pit, since soil condition in these piles were similar to soil condition in the pit based on PID readings.

2.5 Review of Vermont Hazardous Sites List

A review of the Vermont Hazardous Waste Sites List indicated that four sites are listed in the Ethan Allen Industrial Park in addition to the Burlington News Agency. Champlain Cable Company is discussed is section 2.2. The site named "Hershberg," which is the property to the south of COSTCO owned by Moore-Pierce Realty Partnership and occupied by Jordons First Food Products, has ongoing site monitoring. Also, J&B International and Roadway Express, both trucking companies at the southern end of the industrial park are on the hazardous waste sites list. These later three properties are not adjacent to Burlington News Agency and are not expected to impact the site under consideration.

3.0 REGIONAL ENVIRONMENTAL SETTING

3.1 Discussion of Site Surficial Geology

According to the "Soil Survey of Chittenden County, Vermont, 1974"[5] the soils covering the site of the Burlington News Agency property are silty, Figure 5. Surrounding these soils are AdA, loamy sands with 0-5% slopes to the north and Au, fine sandy loam to the south. One small rock outcrop were observed on site and another on the adjacent property to the south, Figure 7.

The predominate geological features proximate to the Burlington News Agency property are a hill to the west, quarries to the southwest, and relatively flat land to the south, east and north, Figure 2. A perched water table was observed on 19 May 1997 covering the property to the east. The elevation of the site and the entire surrounding area is about 300 feet relative to the National Vertical Geodetic Data (NVGD) of 1929. The Geological Survey map depicting the site was enlarged 300% and notes were added as shown in Figure 2.

The lowest area immediately adjacent to the site forms the major south to north drainage for the Ethan Allen Industrial Park. From this drainage, at an elevation of just less than 300 feet, the topography raises to an elevation of about 440 feet NVGD to the west. This area is called Water Tower Hill. Roosevelt Highway (Route 2 and 7) is at an elevation of about 340 feet just west of the site and decreases in elevation toward the north.

3.2 Discussion of Site Hydrogeology

The primary aquifer of concern associated with the Burlington News Agency property is the unconfined surficial acquifer. Groundwater flow in the surficial acquifer is controlled, among other things, by the physical characteristics of the aquifer (material type and porosity, etc.), the thickness, areal extent, and configuration of the aquifer, by the amount and type of recharge to the aquifer, and by the presence of areas where discharge can occur. In shallow water table aquifers, the surficial topography can also be a significant controlling feature in groundwater flow.

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[5] Soil Survey of Chittenden County, Vermont. U.S. Department of Agriculture, Issued January 1974.

The two major physical characteristics of an aquifer that affect groundwater flow are the type of soil materials (affecting hydraulic conductivity) and the porosity of soil materials (affecting groundwater velocity). Hydraulic conductivity describes the ability of the aquifer to transmit fluid and is expressed in units of length/time. The presence of heterogeneities within the aquifer such as bedding planes or clay layers significantly affect groundwater flow by creating either preferential pathways or barriers to flow. The groundwater flow velocity is the actual velocity of the groundwater flowing through the aquifer. In a shallow water table (unconfined) aquifer such as at Burlington News Agency, the velocity is affected by the gradient (the amount of dip) of the water table surface and by the porosity. The amount of asphalt that covers the site also has an impact on the groundwater flow characteristics.

To determine the direction of groundwater flow in a shallow unconfined aquifer, the elevation of the groundwater levels must be measured in shallow wells. These measurements are located on a map, and from them, the topography of the water table is estimated and water table contours generated. Water table contours are imaginary lines connecting equal water elevations that show the estimated topography of the water table. The direction of groundwater flow is then estimated from the map as perpendicular to the water table contours. Groundwater movement in a shallow unconfined aquifer is from high hydraulic head (the water table elevation in an unconfined acquifer) to low hydraulic head. Groundwater in the vicinity of the removed gasoline tanks is likely to be impacted by the fill placed during site development in 1986, by the excavation for the UST's, and by the cover provided by the building and the asphalt.

Monitoring wells do not exist at the Burlington News Agency and without them a definitive determination of the direction of groundwater is not possible. From site topography and surface water drainage patterns the direction of groundwater flow at the site of the removed underground storage tanks is assumed to be in a pie shaped sector that extends from directly west (toward the drainage that flows from south to north) to north parallel to the drainage. The most likely direction of groundwater flow is toward the northwest; not either directly perpendicular to the south to north drainage or perfectly parallel to the drainage. This assumed most likely direction of groundwater flow is indicated on Figure 2.

4.0 CONTAMINATION REGIME

4.1 Contaminants of Concern

The primary contaminants of concern (COC) at the Burlington News Agency are benzene, toluene, ethylbenzene, total xylenes (collectively referred to as BTEX) from gasoline and diesel fuels used on site. These COC fall into the general category of aromatic hydrocarbons.

4.2 Contaminant Sources

The possible sources of gasoline contamination in the soils and groundwater are the two former underground storage tanks, associated piping to fill the tanks, pipes to the gas pumps, and surface spills related to filling the tanks and filling vehicles at the pumps.

It is unlikely that the tanks leaked at all during the ten years of service based on the condition of the tanks when removed on 13 November 1996. On 8 November 1995 an annual tank tightness test (since 1994) was conducted by NDE Environmental Corporation on the two underground storage tanks. The gasoline tank failed the test. Upon inspection by NDE it was determined that there was an air leak at the base of the vent pipe. This air leak did not result in the loss of gasoline to the environment and the air leak was repaired. Both UST's passed the tightness test by NDE on 12 October 1994, the first year of tank testing since they were installed in 1986.[6]

Two fuel pumps were located on a concrete island above the two tanks. A concrete pad is were also located just south of the pumps. This large concrete pad, depicted in Figures 6 and 7, is used by tractor trailer trucks to load and unload magazines. Gasoline and diesel fuels, if spilled during delivery or during routine filling of vehicles tend to seep into the subsurface through cracks at the boundary between concrete pads and the asphalt.

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[6] Records of tank tightness testing are on file at Burlington News Agency.

5.0 FIELD INVESTIGATION RESULTS

5.1 Methods

The field investigation was conducted on 28 March 1997. Adams Engineering, Inc. was contracted to provide the drilling equipment to advance soil borings and install either temporary or permanent monitoring wells. Soils borings were collected by vibrating a two inch diameter core barrel lined with plastic up to five feet at a time into the ground. The soil core was removed from the barrel and the plastic was cut open exposing the soils. These soils were immediately analyzed with a PID along the entire length of the soil core, Figure 9. A metal spatula was used dig into the core and expose fresh soil to the PID. After examination of the core, soil samples were collected, placed in plastic Ziplock bags, and placed in the field sampling trailer for further analysis, Figure 10. After heating the samples in the trailer with a portable electric heater, the bags were opened just enough to insert the probe of the PID and field measurements were taken of the headspace gas above the soils in the plastic bags.

ITS Intertek Testing Services (ITS) is located just south of Interstate Highway exit 16 in Colchester, Vermont. ITS agreed to analyze groundwater sample(s) during the field investigation and provide results within two hours of sample delivery. The analytical screening method consisted of measuring an aliquot from the sample. The aliquot was placed in a head space vial and loaded into a head space analyzer (Tekmar Headspace Analyzer) equipped with an autosampler attached to a Hewlett-Packard 5890 GC. The sample was then heated and a measured volume of the sample head space was injected onto a capillary column. Volatile organic compounds were detected using an electron capture detector (ECD) and a flame ionization detector (FID). Results of the same day screening were reported by telephone to field personnel.

ITS was also contracted to provide analytical chemistry services for soil and groundwater samples. These samples were submitted to the laboratory at the end of the field investigation and analyzed by U.S. EPA method 8020. Results were reported for benzene, toluene, ethybenzene, xylenes, and Methyl tert-Butyl Ether (MTBE), an additive in fuels. MTBE typically is transported in groundwater at a faster rate than BTEX compounds and is used as an early indicator of hydrocarbon contamination by fuels.

5.2 Results

5.2.1 Subsurface (Groundwater and soils)

Five soil borings were advanced as indicated in Figure 7; SB-1 to SB-5. Soil boring 1 (SB-1) was located four feet from the site of the excavation of the gasoline and diesel tanks in a location that is most likely in the downstream groundwater flow path. The ground surface of SB-1, and all subsequent borings, was blacktop. Below the blacktop was a layer of crushed stone and coarse sand. The coarse sand became finer and saturated about two to two and one-half feet below grade. Soil boring logs by Adams Engineering are in Appendix A. Soil boring information is also listed in Table 2. The depth below ground surface and the soil description is followed by results of the field screening by PID. A significant result of the soil boring was the discovery of an layer of silt/clay at about three feet below ground surface. Figure 11 is a picture of the sandy layer overlaying the silt/clay layer in SB-1 and is typical of all soil borings. This layer would impede the vertical migration of contaminants in the subsurface. For a lighter than water contaminant such as gasoline of diesel fuels, any free product would tend to float on top of the shallow water table, and vertical migration of dissolved fuels would be restricted.

After SB-1 was advanced a temporary stainless steel monitoring well was installed. The screened interval of the well was from 1.1 to 6.1 feet below ground surface. Ground water was measure at 2.1 feet below ground surface. The well was purged with a peristaltic pump until greater than three volumes of well water were removed. Recovery of water in the well was almost instantaneous. After stabilization of the elevation of the groundwater in the well had occurred, a groundwater sample was collected. This sample was immediately transported to ITS Testing Services laboratory which was just minutes away. The groundwater analytical results were available by 9:30 AM the same day. The chemist indicated that no BTEX compounds were detected and that a small peak on the chromatography was most likely MTBE. (A duplicate of this groundwater sample was submitted to the laboratory of analysis by U.S. EPA method 8020. The results of the field screening were later confirmed.)

Based on the results of the screening of the groundwater sample, the field screening results by PID shown in Table 2, and the visual inspection of the soils in the boring, it was decided not install permanent groundwater monitoring wells. [7]

Table 2. Results of field screening with PID, ppm as benzene, 28 March 1997.

Soil Boring Identification	Depth, inches below ground surface	Soil description	Depth of sample, inches below ground surface	Initial Screening from CORE	Final Screening after heating in plastic bag (State Method)
SB-1	18-30	silt/clay	18-30	0.2	1.3
	30-37	gravel	30-37	0.2	1.3
	37-60	silt/clay	37-60	0.2	1.7
	60-90	silt/clay	60-90	0.2	1.1
SB-2	0-12	tarmac, gravel,sandy			
	12-42	gravel/sandy	41-42	0.2	0.9
	42-51	silt/clay	42-43	0.2	0.7
SB-3	0-2	tarmac	23	0.2	0.9
	2-24	gravel/sandy	24	0.2	0.8
	24-60	silt/clay	48	0.2	1.3
SB-4	0-6	tarmac/gravel			
	6-26	silt/clay	12	0.2	0.8
	26-36	sandy	30-36	0.2	0.8
	36-60	silt/clay	48	0.2	0.8
SB-5	0-6	tarmac/gravel			
	6-17	sand/gravel	14-16	0.2	3.1
	17-26	silt/clay	18-20	0.2	2.3

At this point the field investigation proceeded with four additional soil borings. Three soil borings were located in the pie shaped sector that represented the most likely range of groundwater flow direction from the site of the excavation based on surface topography and surface water drainage patterns. These three soil borings were located about 30 to 35 feet from the excavation as indicated in Figure 7. The final soil boring, SB-5, was located east of the excavation in a region that was most likely represented upgradient groundwater and soil

[7] This decision was in accordance with a plan agreed upon with the Site Manager, Mr. Andrew Shively as documented in his letter to Mr. Brian Todd Murphy dated 13 February 1997, and during a site investigation

conditions. A photograph of the site is in Figure 8 shows the location of soil borings relative to the excavation. The new above ground storage tank is seen east of the excavation and the Burlington News Building is in the background. The location of the soil borings are indicated by the orange highway cones.

Pictures of soils from SB-2, SB-3, SB-4 and SB-5 are in Figures 12 to 15, respectively. The interface between the upper gravel and sandy layer and the lower silt/clay layer is evident in all photographs.

In all four additional soil borings and impeding layer was encountered at about two to four feet below ground surface. The soil borings were advanced well beyond this interface to establish that it was a substantial impeding layer and not simple a thin lens of silt or clay. This silt layer is natural and is represented on the Soil Conservation Map, Figure 5.

The result of the groundwater sample collected from MW-1 (SB-1) is listed in Table 3 and Appendix B.[8] The Groundwater Enforcement Standard and the Department of Health Groundwater Advisory level is also listed for comparison. No BTEX compounds were detected and the concentration of MTBE is well below the Health Advisory level.

Table 3. Results of analytical chemistry, ug/l (micrograms per liter); 28 March 1997.

Compound	Groundwater Enforcement Standard	Vermont Health Advisory Level (March 1996)	MW-1 (Temporary Well)
Benzene	5.0	1.0	**<0.5**
Toluene	2420	none	**<0.5**
Ethylbenze	680	none	**<0.5**
m/p xylene	400	none	**<1.0**
o xylene	400	none	**<0.5**
Methyl tert-Butyl Ether	none	40.0	**12**

planing meeting between Mr. Shively and Mr. Roger Binkerd of ***BINKERD ENVIRONMENTAL*** on 24 March 1997.
[8] On 17 April 1997, based on a discussion of site conditions and at the request of Mr. Roger C. Binkerd, Mr. Andrew Shively agreed that TPH analysis was not required.

The analytical chemistry results for the two soil samples collected and submitted to the laboratory are listed in Table 4 and Appendix B.[9] SB-5, 14-16 (inches) was selected for further analysis because this boring had the highest PID result of 3.1 ppm. SB-1, 30-37 (inches) was selected for further analysis because the field screening result was typical of other soils sample screening results. SB-1 was also closest to the excavation and the depth of this sample was near the interface between the surface gravel/sandy layer and the deeper silt/clay layer.

Table 4. Results of analytical chemistry, ug/Kg (micrograms per kilogram); 28 March 1997

Compound	SB1, 30-37	SB5,14-16
Benzene	<0.54	<0.56
Toluene	<0.54	<0.56
Ethylbenze	<0.54	<0.56
m/p xylene	<1.1	<1.1
o xylene	<0.54	<0.56
Methyl tert-Butyl Ether	<0.54	<0.56

5.2.2 Surface Water

Surface water was not sampled since the laboratory result of the groundwater sample did not detect any BTEX compounds, and the soil samples from the five borings were not contaminated according to the field results from the PID measurements.

9 *Ibid.*

6.0 POTENTIAL RISK AND POTENTIAL RECEPTORS

6.1 Human Health

In general, to have potential risk to human health three factors must be present: there must be a contaminant(s); a pathway(s); and, a receptor(s).

Contaminant: At the Burlington News Agency site the only contaminant measured in the environment was MTBE at 12 ug/l, well below the Vermont Health Advisory level of 40.0 ug/l. This represents a low level of contamination, which is most likely due to surface spills of gasoline or diesel fuels that occurred during routine filling of the UST's, or during the filling of gasoline or diesel tanks in vehicles.

Pathways: One possible route of exposure is by groundwater transport. The water table is shallow and the groundwater flow is most likely influenced by the extensive site coverage by asphalt and buildings, and the drainage associated with development of the site. The asphalt and buildings acts as a "cap" and reduces the amount of direct infiltration of rain water and snow melt. This may tend to reduce the rate of transport of possible contaminants off site. The second possible pathway is via the air. Contamination in the vadose zone (above the water table) of the subsurface could migrate directly to the overlying air or into basements. The extensive "cap" on site reduces direct exposure, and there are no basements on site.

Receptors: Possible human receptors are the employees at the Burlington News Agency.

The chain (contaminant - pathway - receptors) appears broken since a volatile organic contaminant was not detected. This break in the chain essentially eliminates the risk to human health. Even if contamination was present the "cap" made by the asphalt and concrete and absence of basements on site, eliminates exposure by employees.

6.2 Environmental

Due to the low level of MTBE and no discovery of BTEX compounds there is no environmental risk to the unconfined surficial aquifer and soil near the removed UST's. Since the ground water is not contaminated, transport of contaminants to the surface water west of the site is not possible.

7.0 IDENTIFICATION OF DATA GAPS AND DATA NEEDS

7.1 Contaminant Fate and Transport

It is the opinion of principal investigator at ***BINKERD ENVIRONMENTAL*** that contaminant fate and transport is sufficiently understood at this site to conclude that no additional information on fate and transport is necessary. This conclusion is based on the following facts:

- the UST's were in excellent condition when inspected following removal and did not leak;
- MW-1, a temporary groundwater monitoring well adjacent to the edge of the excavation, was not impacted as demonstrated by on site PID measurements and analytical laboratory measurements; and,
- Five soil borings surrounding the excavation did not detect any contamination as documented by field PID screening, visual inspection, and analytical chemistry measurements.

7.2 Risk to Human Health and the Environment

There does not appear to be a demonstrated risk to human health or the environment. This conclusion is based on the lack of contamination observed on site and the lack of a viable pathway for exposure to humans or the environment.

7.3 Remediation and Monitoring

The soil pile stockpiled in the back of the site should be monitored. When PID readings are less than 10 ppm, the soil pile should be spread on site. There is sufficient area available on site to spread the stockpiled soil without contaminants being spread to the adjacent drainage and without exposure to the public. Monitoring of the pile should begin in June 1997, and continue every six months until the pile is sufficiently reduced in contaminant concentration. After this is accomplished and documented, it is the opinion of ***BINKERD ENVIRONMENTAL*** that the Burlington News Agency site should be designated by the State Sites Management Section as "closed" and that no additional work should be required.

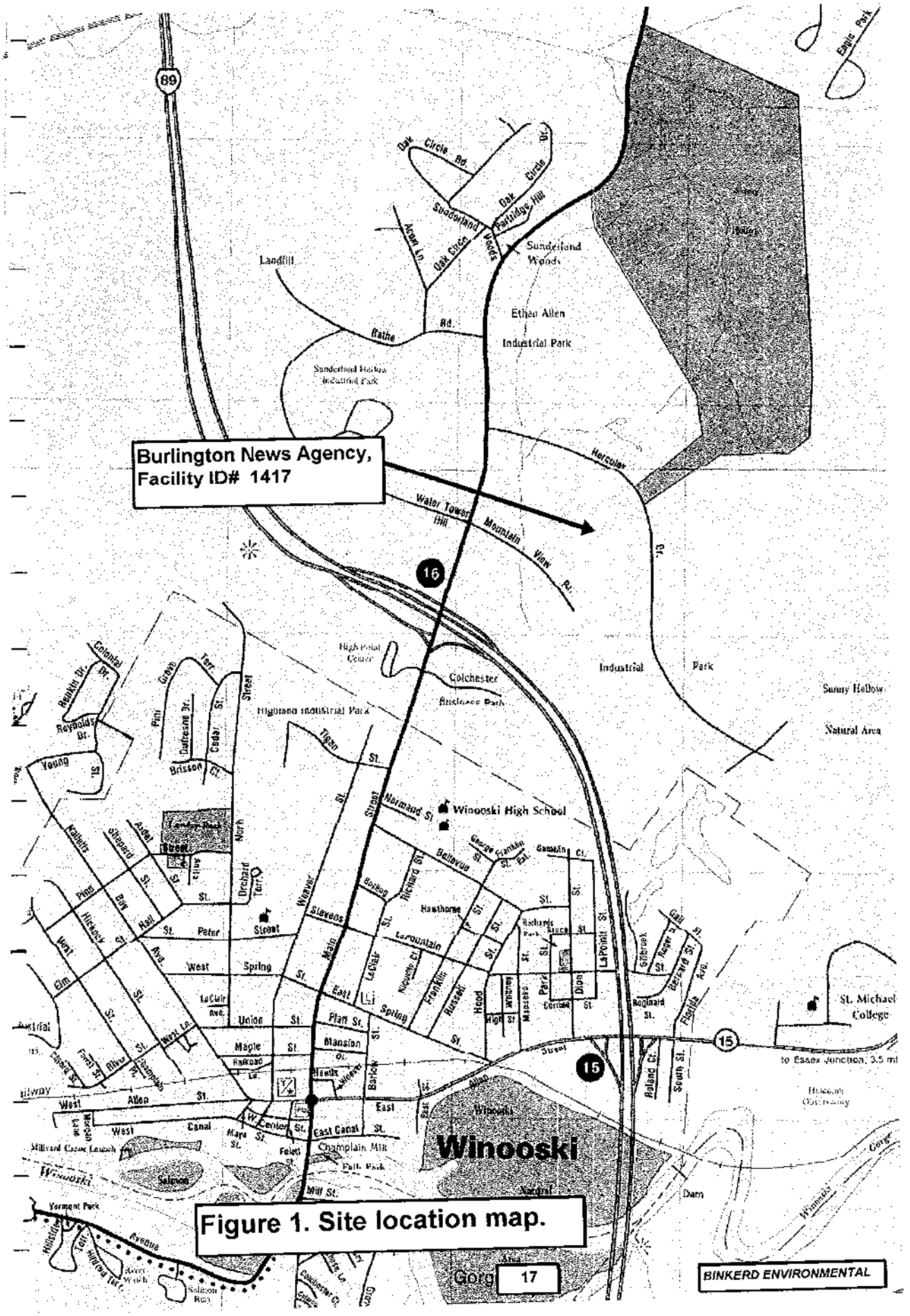

Figure 1. Site location map.

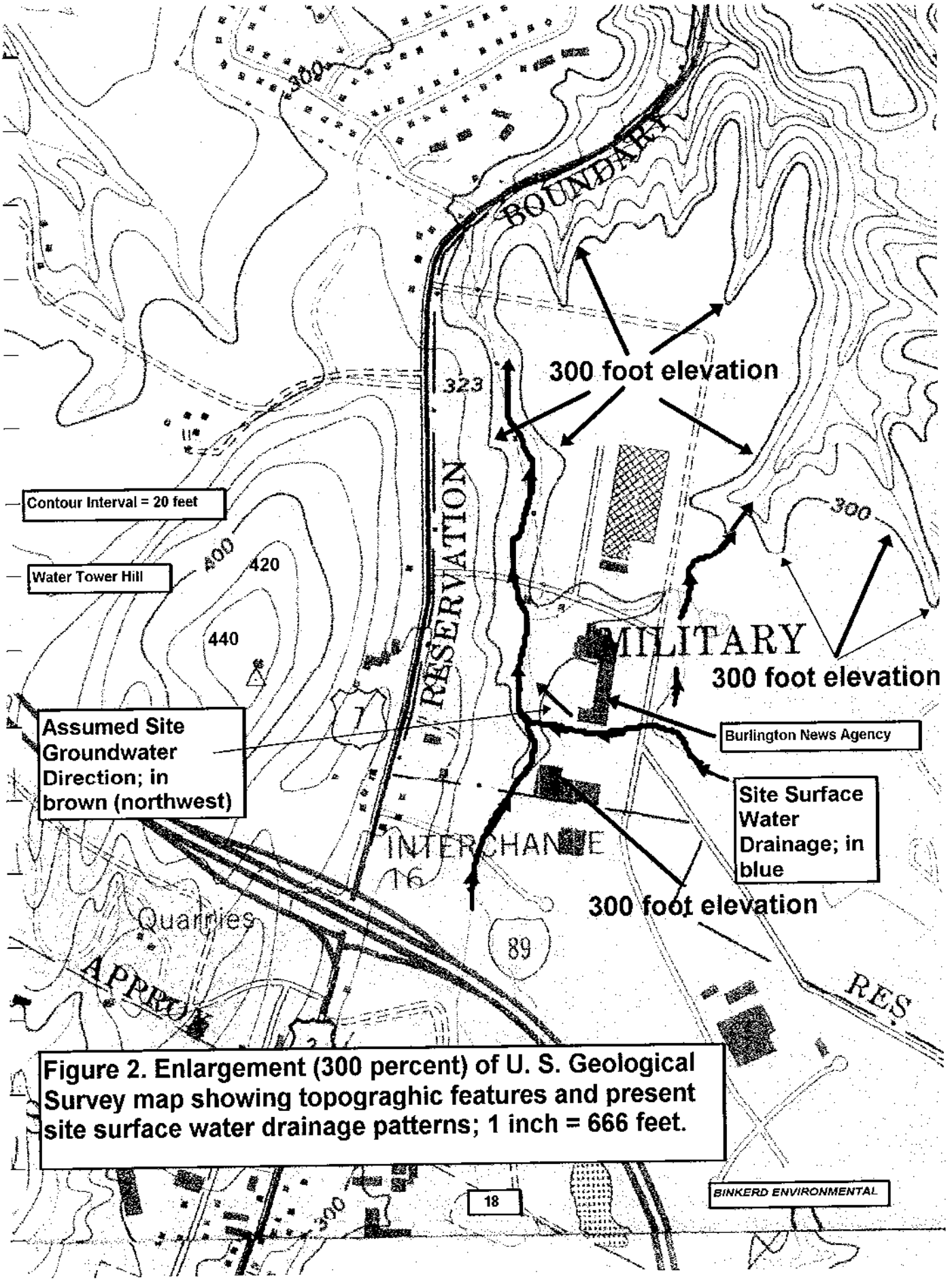

Figure 2. Enlargement (300 percent) of U. S. Geological Survey map showing topograghic features and present site surface water drainage patterns; 1 inch = 666 feet.

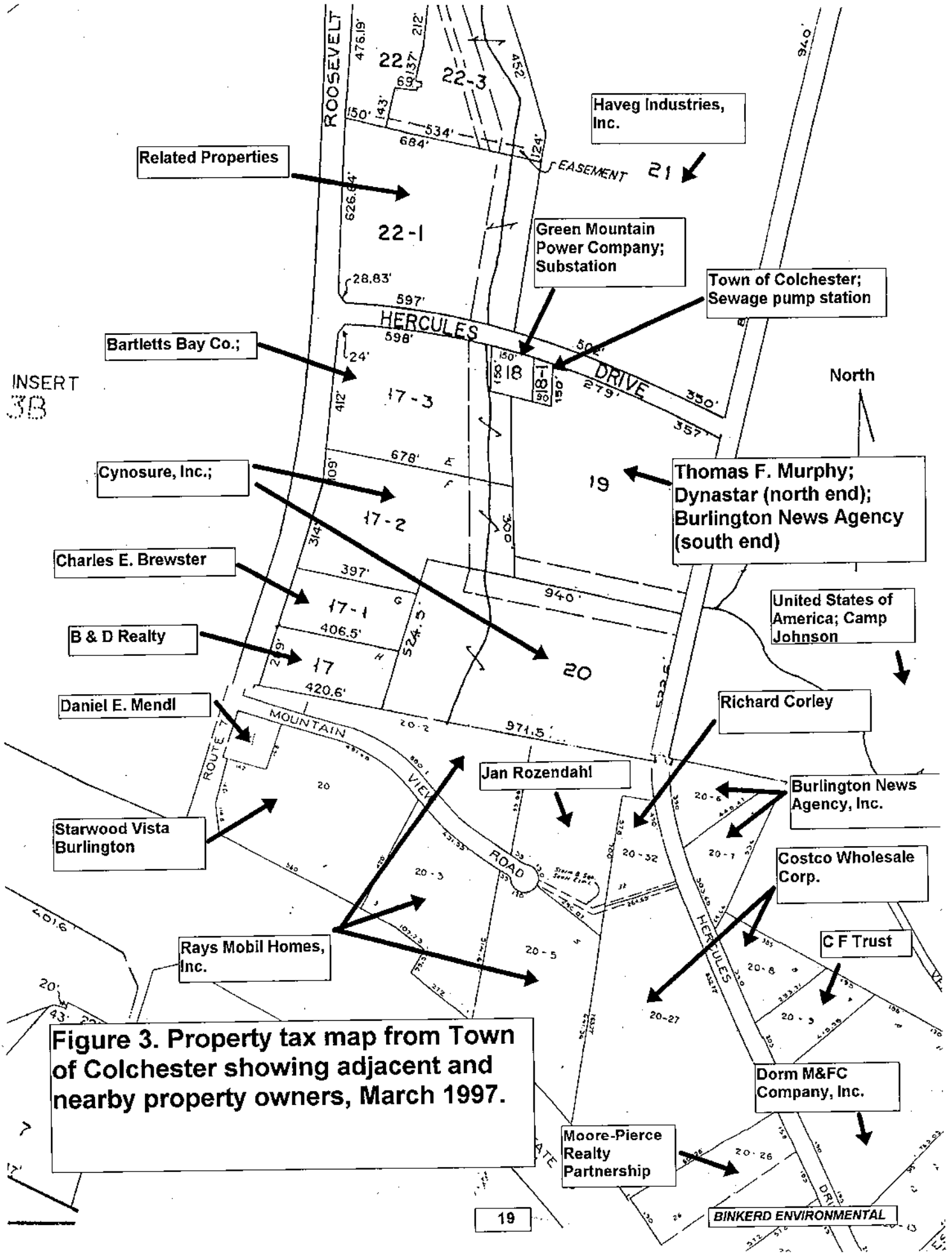

Figure 3. Property tax map from Town of Colchester showing adjacent and nearby property owners, March 1997.

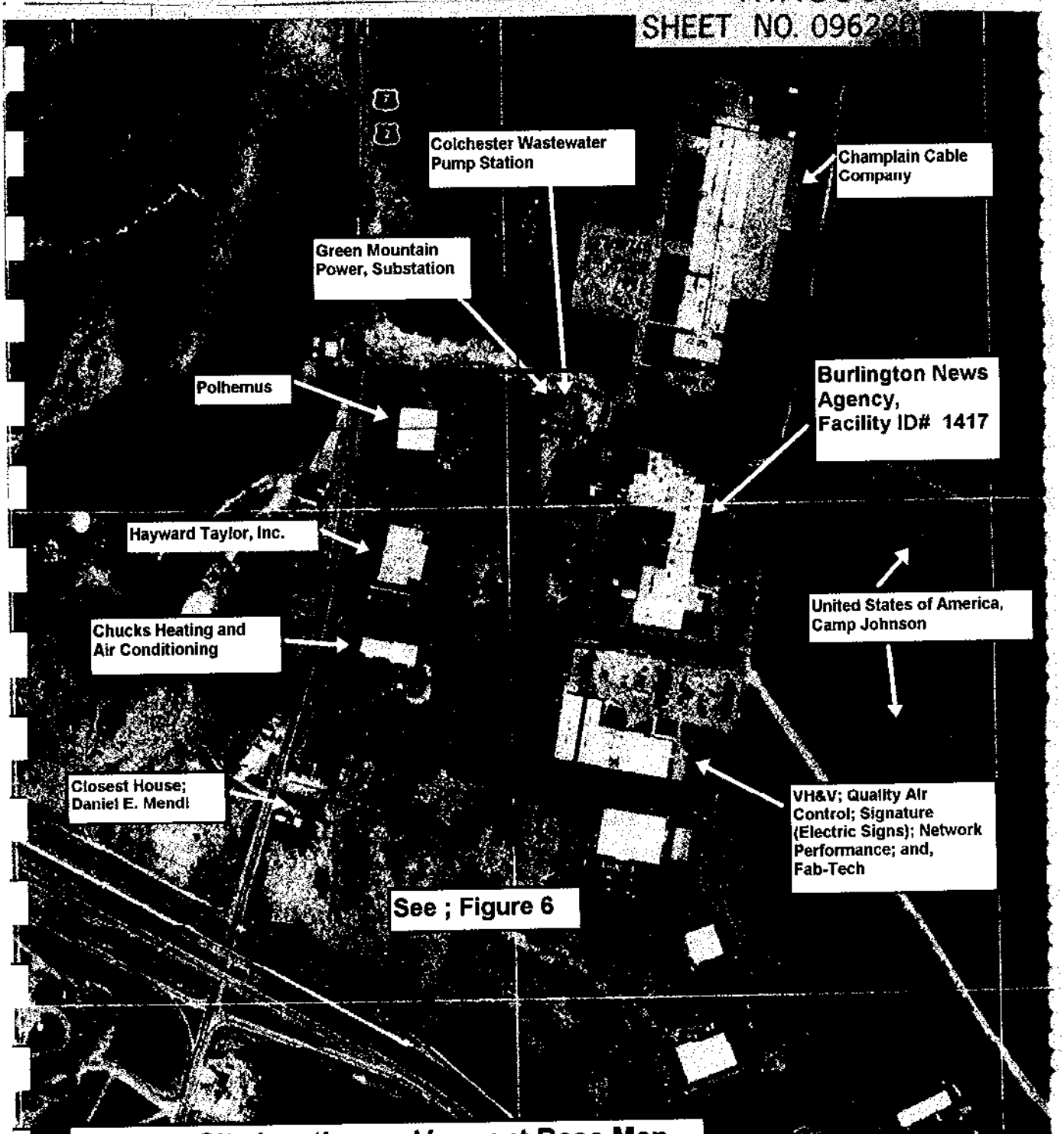

Figure 4. Site location on Vermont Base Map, Winooski , Sheet No. 096220, Series 5000, flown spring of 1988; showing adjacent properties, buildings and occupants.

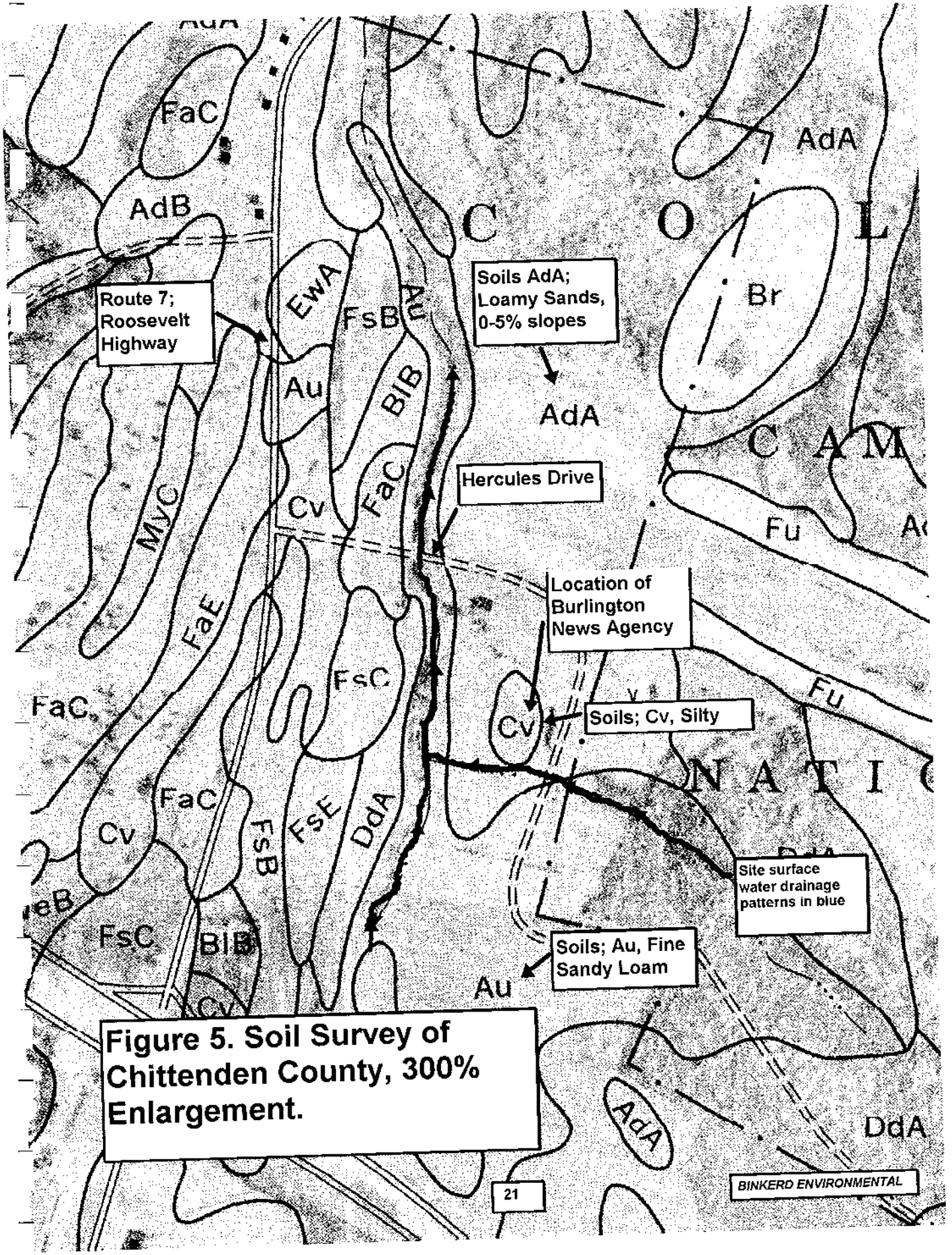

Figure 5. Soil Survey of Chittenden County, 300% Enlargement.

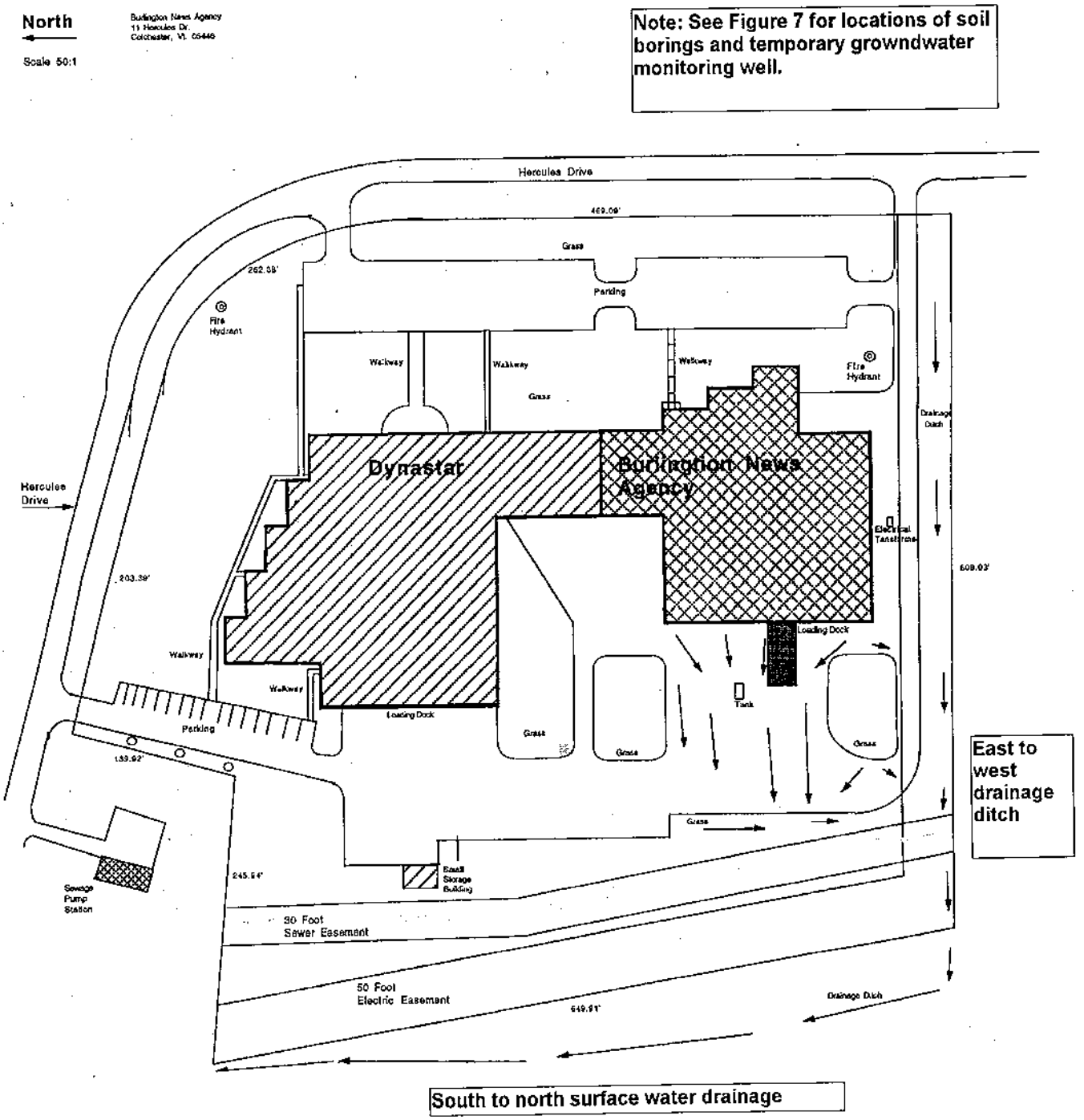

Figure 6. Site location map showing the building, surface water runoff patterns from the parking lot, east-west drainage ditch, and south-north off site drainage; drawing provided by Burlington News Agency.

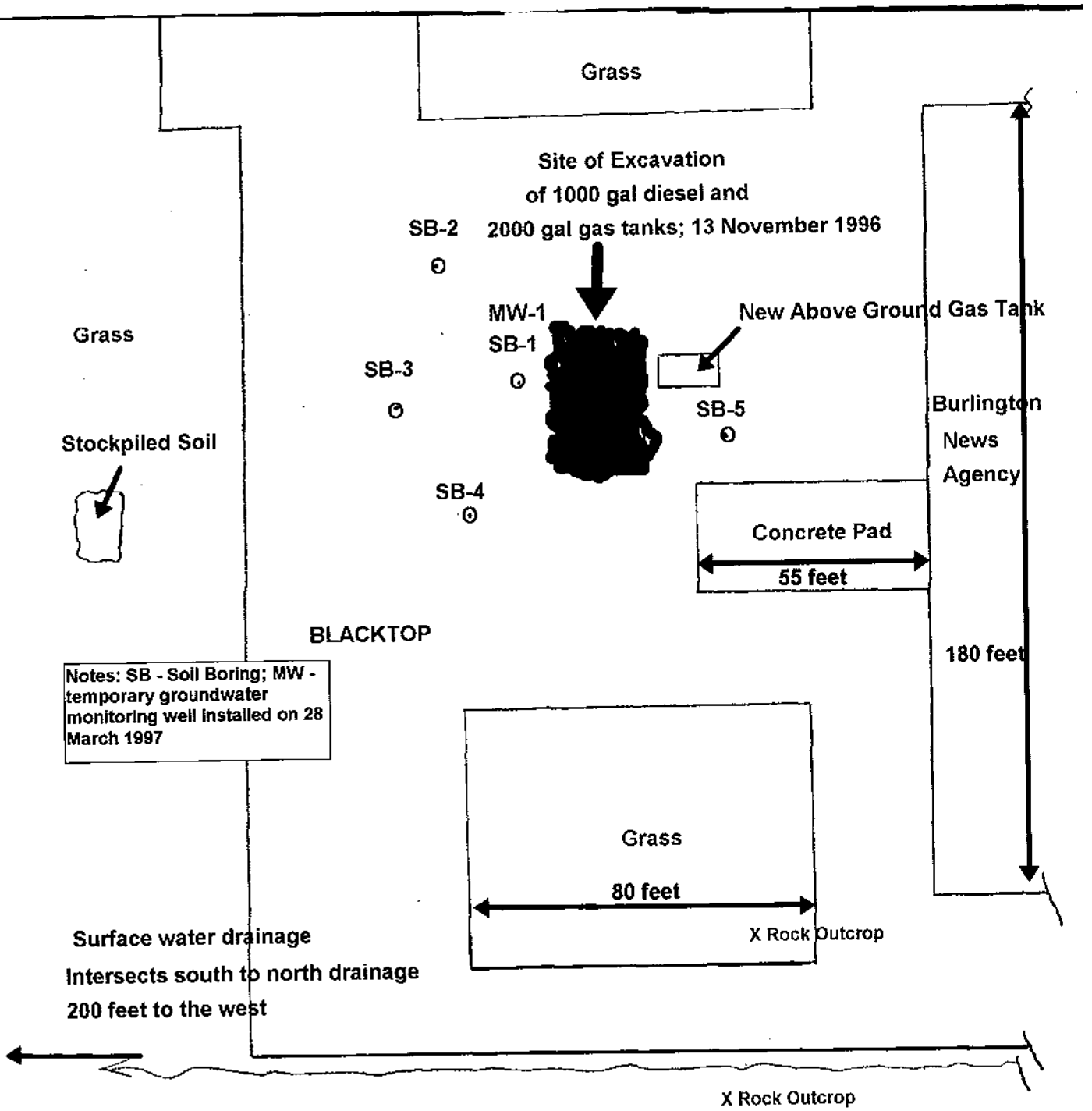

Figure 7. Site location map showing locations of soil borings and temporary monitoring well relative to excavation.

Scale: 1 inch = 35 feet

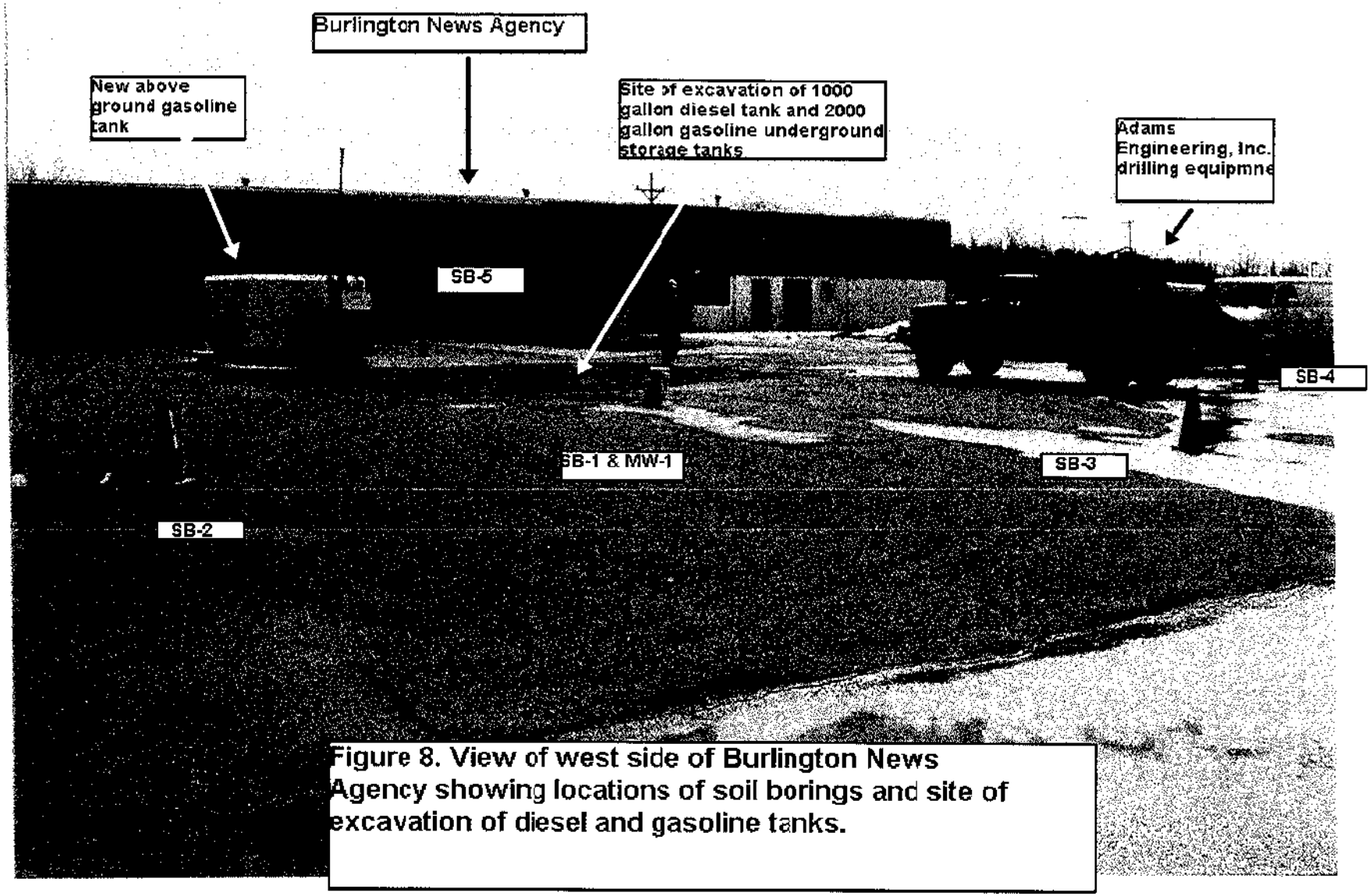

Figure 8. View of west side of Burlington News Agency showing locations of soil borings and site of excavation of diesel and gasoline tanks.

Figure 9. Field screening of core with photoionization detector.

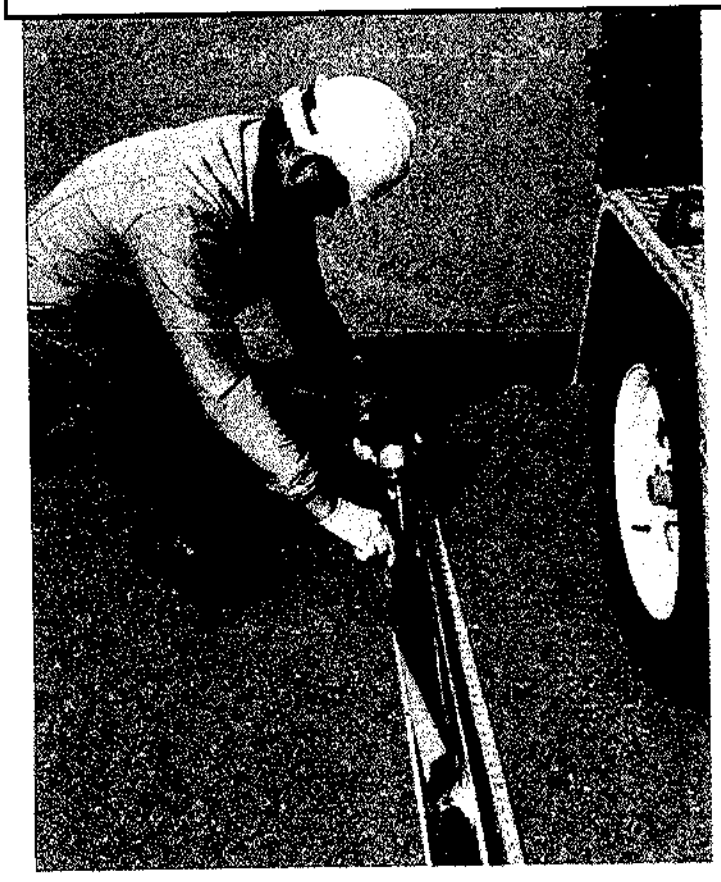

Figure 10. Soil samples in plastic bags prepared for PID screening.

Figure 11. Close-up of soil boring showing upper gravel/sandy layer on top of tight silt/clay layer (typical of all soil borings at Burlington News Agency).

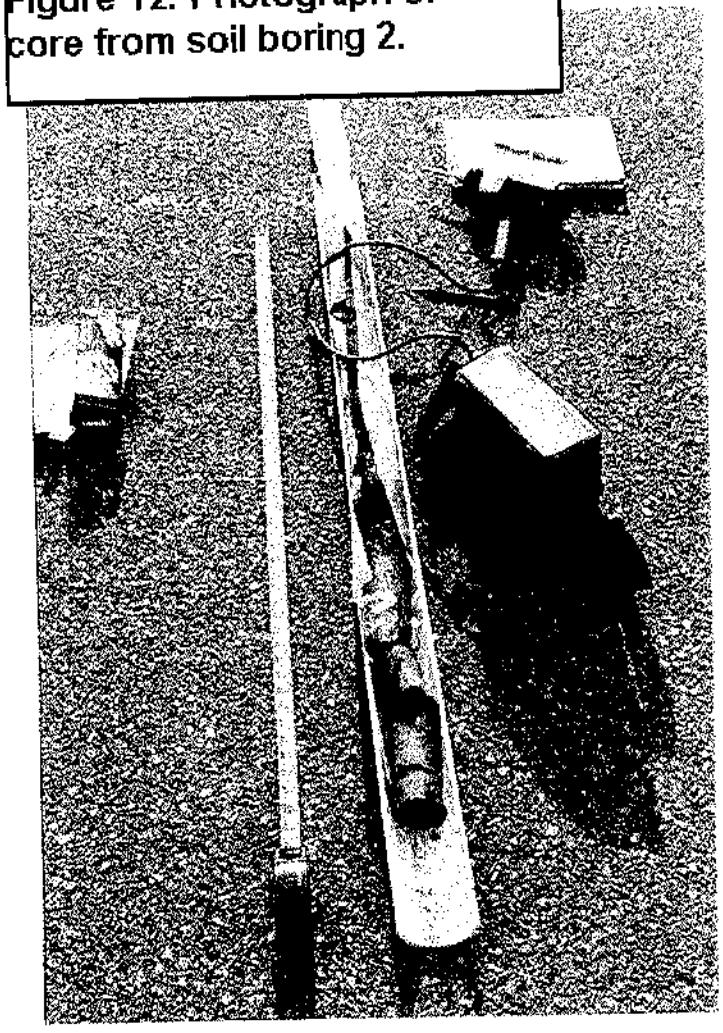

Figure 12. Photograph of core from soil boring 2.

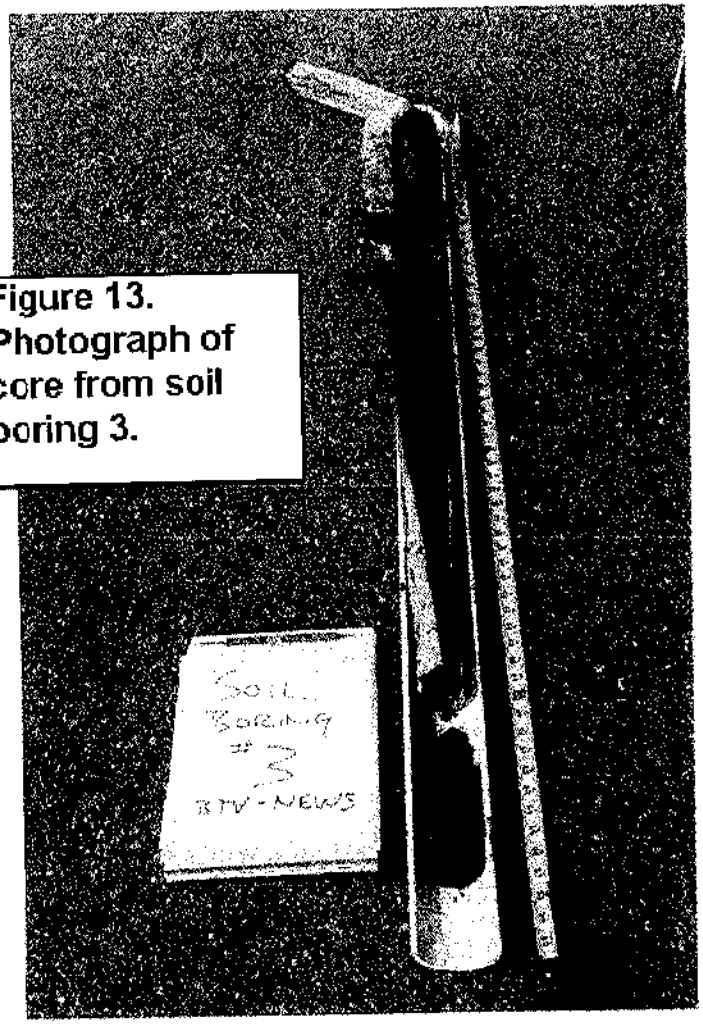

Figure 13. Photograph of core from soil boring 3.

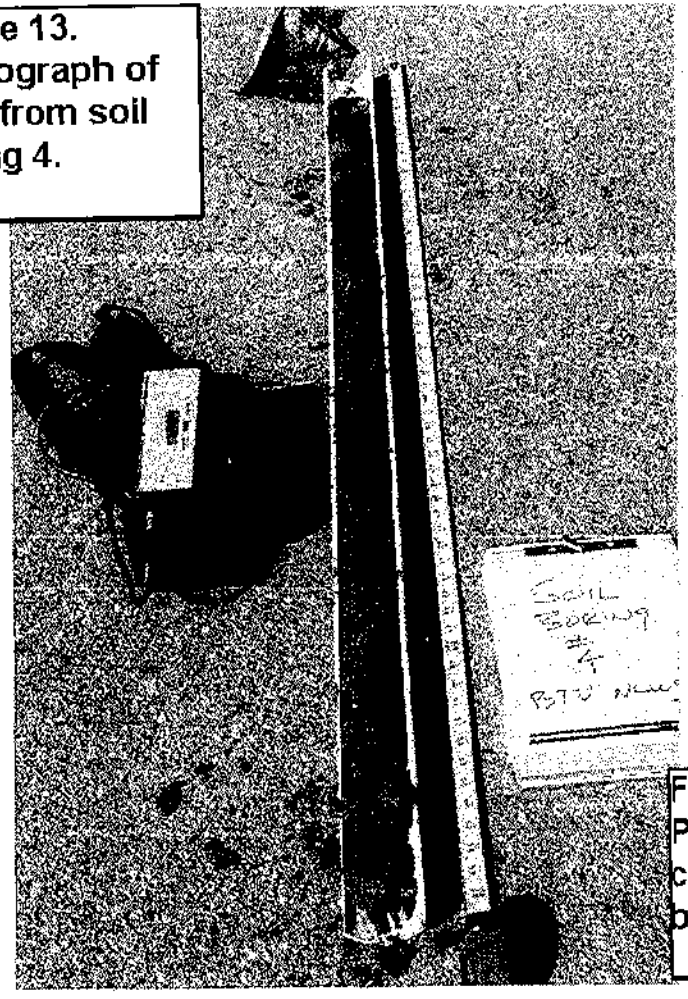

Figure 13. Photograph of core from soil boring 4.

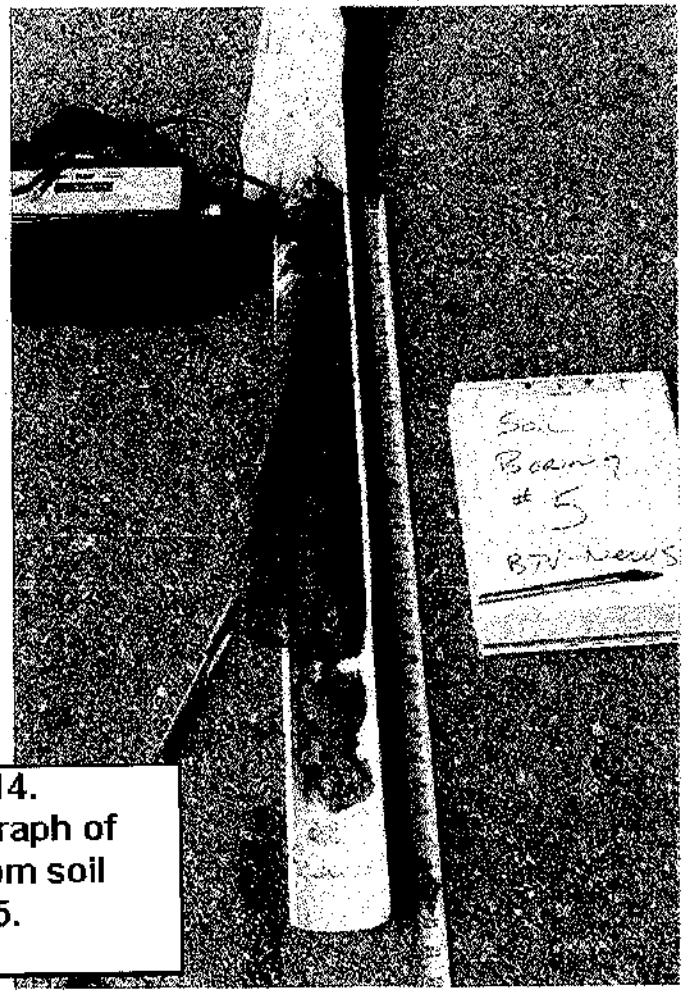

Figure 14. Photograph of core from soil boring 5.

APPENDIX A

Soil Boring Logs

ADAMS ENGINEERING
Gerard Adams
#47 Blakey Rd., Underhill, VT 05489-9493
(802)-899-4945

March 28, 1997

Mr. Roger Binkerd PE
Binkerd Environmental
Well logs: Burlington News Agency

2" point through blacktop. Soils sampled in open borehole with 2 3/5" OD X 2 3/8" ID X 5' NQ sampler lined with a polyethylene bag , the sampler brought to the surface, and the sample contained in the PE bag vibrated out for examination. Temporary stainless steel placed as noted.. Well developed with peristaltic pump using dedicated polyethylene suction tubing. Boreholes collapsed at -2'+- backfilled with sand.backfilled with sand.

3/28/97 TW #1
SOILS WELL

G.	Blacktop & sub grade crushed stone.
0>-1.5'	8" & 4" Solid auger.
-1.5>4.2'	Coarse sand becoming saturated // (over) blue gray silt/clay, water about -2.3'
-4.2>7.5'	Blue gray silt/clay.

-1.1>6.1' Temporary stainless steel well.
Well developed: Fair flow, cloudy.

SB #2

G>-1'	2" Point through blacktop.
-1>4.2'	Coarse sand becoming saturated // light brown silt with limestone,fragment.

SB #3

G>-1'	2" Point through blacktop.
-1>4.2'	Coarse sand becoming saturated // silt/clay.

SB #4

G>-1'	2" Point through blacktop.
-1>4.2'	Coarse sand becoming saturated // silt/clay//saturated sand//silt/clay.

SB #5

G>-1'	Point through blacktop.
-1>3.6'	Refusal, Coarse sand becoming saturated // blue gray silt clay//brown saturated silty sand.

G. Adams

APPENDIX B

Analytical Chemistry Results

ITS Intertek Testing Services
Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Binkerd Environmental
664 Hills Point Road
Charlotte, VT 05445

Date : 04/07/97
ETR Number : 64405
Project No.: 97000
No. Samples: 3
Arrived : 03/28/97

Attention : Roger Binkerd

Job:BTV-News

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
328178	Well 1:03/28/97 (Water)	
8020	Aromatic Volatiles	C
328179	SB1,30-37:03/28/97 (Soil)	
8020	Aromatic Volatiles	C
328180	SB5,14-16:03/28/97 (Soil)	
8020	Aromatic Volatiles	C

Comments/Notes

C = Procedure/analysis completed

< Last Page > Submitted By : Ken R. Clinger Aquatec Inc.

CHAIN of CUSTODY

ITS Environmental

55 South Park Drive
Colchester, Vermont 05446
(802) 655-1203 or (800) 654-4255
Fax: (802) 655-1248

ITS Project Manger: Chris Ouellette

CLIENT INFORMATION

Name: BINKERD ENVIRONMENTAL
Address: 664 Hills Point Road
Charlotte, VT 05445
Phone: 802 425 4939
Fax: 802 425 5939
Contact: Roger Binkerd
Quote #:

SHIPPING INFORMATION

Carrier: [ ] FedEx [ ] Airborne [ ] UPS [X] By Hand [ ] DHL [ ] Other: ____
Airbill Number:
Date Shipped:

PROJECT INFORMATION

Project Name: 97002
Site: BTV - News

TURNAROUND TIME

[X] Standard
[ ] RUSH (please specify)*:
* Must coordinate with project manager. A surcharge will be applied.

ANALYSIS REQUESTED

HAZARDOUS SAMPLES

Are samples hazardous? Yes/No
If yes, please explain:

Sample ID	Lab ID (For Lab Use Only)	Date and Time Collected		Matrix H_2O, Soil, etc.	# of Containers 40ml	BTEX + MTBE									ADDED CHEMICALS HCl, H_2SO_4, NaOH, other	COMMENTS
Well 1		3/28	8:15	H_2O	2	X									HCl	4°C
SB1, 30-37		3/28	7:30	Soil	2	X									—	4°C
SB5, 14-16		3/28	10:45	Soil	2	X									—	4°C

Shipment for Case complete? [ ] Yes [ ] No

Sample used for a spike and/or duplicate:

Sampler Name: Roger Binkerd

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
R Binkerd	3/28/97	1300	[signature]	3-28-97	1300
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time

FOR LABORATORY USE ONLY

Samples received in good condition? [X] Yes [ ] No
Custody Seal Intact? [ ] Yes [X] No
Samples Chilled? 5 C [X] Yes [ ] No

The following Qualifiers may be used when reporting any Organic Parameters analyzed by Gas Chromatography (GC) or High Pressure Liquid Chromatography (HPLC). Any additional qualifiers used in the reports will be described in the case narrative. These flags are based on the EPA Contract Laboratory Program statement of work.

GC/HPLC Qualifiers

U - Indicates compound was analyzed for but not detected above the reporting limit.

J - Indicates an estimated value. This flag is used when the result is less than the reporting limit, but ≥ 1/2 reporting limit.

P - This flag is used for a pesticide/Aroclor target analyte when there is greater than 25.0% difference for detected concentrations between the two analytical columns. The lower of the two values is reported on the Form I and flagged with a "P".

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated method blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. Only the samples get a "B" flag. The method blank does not.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. This flag alerts data users that any discrepancies between the concentrations reported for the dilutions may be due to dilution of the sample or extract. It additionally indicates that spike recoveries may have been diluted below quantifiable levels.

E - This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than the upper level of calibration range, the extract shall be diluted and re-analyzed.

X,Y,Z -Laboratory defined flags. These flags must be fully described, and such description attached to the Sample Data Summary Package and the case Narrative. Begin by using "X" and go on to "Y" and "Z" as necessary. These flags may also be used to combine several flags, as needed.

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SB1_30-37

Lab Name: ITS ENVIRONMENTAL Contract: 97000

Lab Code: INCHVT Case No.: 97000 SAS No.: SDG No.: 64405

Matrix: (soil/water) SOIL Lab Sample ID: 328179

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 03AR970344-I061

Level: (low/med) LOW Date Received: 03/28/97

% Moisture: not dec. 7 Date Analyzed: 04/03/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1634-04-4	Methyl tert-Butyl Ether	0.54	U
71-43-2	Benzene	0.54	U
108-88-3	Toluene	0.54	U
100-41-4	Ethylbenzene	0.54	U
	p/m-Xylene	1.1	U
95-47-6	o-Xylene	0.54	U

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SB5_14-16

Lab Name: ITS ENVIRONMENTAL Contract: 97000

Lab Code: INCHVT Case No.: 97000 SAS No.: SDG No.: 64405

Matrix: (soil/water) SOIL Lab Sample ID: 328180

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 02AR970513-I021

Level: (low/med) LOW Date Received: 03/28/97

% Moisture: not dec. 10 Date Analyzed: 04/02/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1634-04-4	Methyl tert-Butyl Ether	0.56	U
71-43-2	Benzene	0.56	U
108-88-3	Toluene	0.56	U
100-41-4	Ethylbenzene	0.56	U
	p/m-Xylene	1.1	U
95-47-6	o-Xylene	0.56	U

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

WELL_1

Lab Name: ITS ENVIRONMENTAL Contract: 97000

Lab Code: INCHVT Case No.: 97000 SAS No.: SDG No.: 64405

Matrix: (soil/water) WATER Lab Sample ID: 328178

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 03AR970344-I011

Level: (low/med) LOW Date Received: 03/28/97

% Moisture: not dec. _____ Date Analyzed: 04/03/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	12	
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U