

DUFRESNE-HENRY, INC.
 Precision Park
 NORTH SPRINGFIELD, VERMONT 05150

LETTER OF TRANSMITTAL

(802) 886-2261

TO AGENCY OF NATURAL RESOURCES
HAZARDOUS MATERIALS MAN. DIV.
103 SOUTH MAIN STREET / WEST OFFICE
WATERBURY, VT 05671-0404

DATE <u>5/6/94</u>	JOB NO. <u>414010</u>
ATTENTION <u>MR. CHUCK SCHWER</u>	
RE: <u>FORMER KNOX & SONS - PHASE I PCI</u>	
<u>MAY 10 1994</u>	

GENTLEMEN:

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
1			REPORT - PETROLEUM CONTAMINATION INVESTIGATION FORMER KNOX & SONS MAY 1994
			<u>93-1543</u>

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
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REMARKS _____

CHUCK,

WE ARE SUBMITTING THE ABOVE REFERENCED REPORT ON BEHALF
OF THE CONNECTICUT RIVER BANK.

COPY TO _____

SIGNED: Bruce Coy

REPORT ON
PETROLEUM CONTAMINATION
INVESTIGATION

CONNECTICUT RIVER BANK
CHARLESTOWN, NEW HAMPSHIRE

Submitted by
Dufresne-Henry, Inc.

May • 1994



May 5, 1994

Mr. William A. Smith
Connecticut River Bank
P.O. Box 500
Charlestown, New Hampshire 03603

Re: Phase I Petroleum Contamination Investigation
Former Knox & Sons
DH 414010

Dear Mr. Smith:

Dufresne-Henry has completed a Phase I Petroleum Contamination Investigation in accordance with our Professional Services Agreement. The investigation consisted of completion of a site Health and Safety Plan, a work plan, the installation and sampling of four shallow groundwater monitoring wells, and conducting a receptor study. This report documents the work completed on the site.

The site Health and Safety Plan and the work plan are included with this report as Attachment A. The scope of the work was based on the January 10, 1994 letter to you from the Agency of Natural Resources, Sites Management Section (SMS). The work plan was accepted by the SMS on March 8, 1994.

The former Ralph Knox & Sons property is located on the west side of U.S. Route 5 in Windsor, Vermont as shown on the locus map included as Attachment B. The 1.3± acre site consists of a single two story building, paved and gravel parking areas, and undeveloped land. The property is surrounded by open land and a farm to the north, Route 5 and an abandoned Suburban Propane distributor to the east, a mobile home park to the south, and undeveloped land to the west. The parcel is very flat with a slight grade to the west. A wetland exists at, or just beyond the western edge of the property. The property is served by the municipal water and sewer system.

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Three (3) Underground Storage Tanks (UST's) were excavated and removed from the site on December 17, 1993. These tanks were one 500 gallon diesel, one 1,000 gallon #2 heating oil, and one 500 gallon gasoline. During the closure assessment PID readings of 170 ppm, 200 ppm, and 200 ppm were observed from tank bed soil samples from the diesel, heating oil, and gasoline tanks respectively. Strong odors primarily characterized as gasoline were noted. Staining of soil with petroleum products was also observed. Depth to groundwater at the time of the assessment was approximately 10 feet. The piping system was determined to be the likely source of contamination. Three test pits were excavated in a semicircle around the tank location. Low level contamination (≤ 3 ppm) was observed at those locations. All excavated soil was backfilled pending additional investigations.

Four (4) shallow groundwater monitoring wells were installed on March 24 and 25, 1994 by M & W Soils Engineering, Inc. of Charlestown, New Hampshire. All borings and well installations were under the field observation of Dufresne-Henry personnel. The wells are designated MW-1 through MW-4. One well was installed just west of the excavation for the tank removal, one was installed approximately 45 feet to the west, and two were installed on the east side of the building near the northeast and southeast corners. In addition, one shallow test boring was performed approximately 85 feet west of the former tank location as a check on surface contamination observed in MW-1 and MW-2. A site sketch showing the well locations is included as Attachment C. Logs of the borings and monitoring well installation reports are included as Attachment D.

During boring advancement split spoon soil samples were taken at various intervals depending on discovered and expected conditions. All samples were screened for the presence of Volatile Organic Compounds (VOC's) with an HNU HW-101 photoionization detector (10.2 eV lamp, calibrated with isobutylene). In MW-1 continuous samples were taken from 1' - 17'. Moderately strong to strong gasoline and oil odors were noted from just under the surface to approximately 12'. HNU readings of up to 150 ppm were observed from samples headspaced at ambient temperature. In the 9' - 11'6" sample a slight pesticide-like (?) odor was observed with an HNU reading of 32 ppm. In MW-2 a moderate oil odor and an HNU reading of 4 ppm was noted in the top 4', but was not observed below 7'. In TB-1 no evidence of contamination (visual, olfactory, or HNU readings) was observed in the samples or on the tools. In both MW-3 and MW-4 a strong, distinct moth ball odor was observed from just under the pavement. In MW-3 the odor was detected to a depth of 12' and in MW-4 to about 3'. The HNU was very slow to react giving a peak reading of 8.5 ppm.

A two inch diameter PVC monitoring well was installed in each boring, with the exception of TB-1. All wells consist of 10' of .020" machine slotted screen. The annular space of each well was backfilled with clean silica sand to a point above the screen and a bentonite seal installed. The wells were protected at the ground surface by grouting in waterproof aluminum monitoring well boxes.

The four monitoring wells were sampled on March 29, 1994 following the standard protocols which accompanied our work plan. The sampling was performed by Dufresne-Henry personnel. Three well volumes were purged prior to drawing a sample. No free product was observed in any well. The samples from MW-1, MW-3, and MW-4 were tested for VOC's by EPA Method 8260. In addition MW-1 was tested for pesticides and herbicides by EPA Methods 608(mod) and 615 respectively. MW-2 was tested for BTEX and MTBE by EPA Methods 602 and 8015. The refrigerated samples were sent to Eastern Analytical, Inc. of Concord, NH on March 31, 1994 via overnight service. A copy of the contract laboratories analytical report is included as Attachment E.

The analytical results indicate elevated levels of BTEX in MW-1. Lesser concentrations of Total Xylenes were found in MW-3 and MW-4. Naphthalene, the source of the moth ball odor, was found in MW-1, MW-2, and MW-3. In MW-2 BTEX and MTBE were not found above detection limits of 1 µg/L and 20 µg/L respectively. In MW-1, no pesticides or herbicides were found above detection limits for the method used. A summary table of analytical results for compounds detected in any sample is presented below.

Compound	ES µg/L	MW-1 µg/L	MW-2 µg/L	MW-3 µg/L	MW-4 µg/L
Benzene	5	20	<1	<1	<1
Toluene	2420	580	<1	<1	<1
Ethylbenzene	680	170	<1	<1	<1
Total Xylenes	400	1,540	<1	6	6
Naphthalene	---	240	TNR	120	300

ES State of Vermont Enforcement Standard
MW Monitoring Well
TNR Test Not Requested

At the time that groundwater samples were obtained on March 29, 1994, the water levels in the wells varied from 2.8 feet to 4.6 feet below the ground surface. The available data indicates the general direction of groundwater movement to be to the southeast toward the Connecticut River. A site sketch showing approximate water table contours as of that date is included as Attachment F.

The 1984 USGS quadrangle indicates 80± structures within a one-half mile radius of the site. Discussions with the Windsor Water and Sewer Department indicate the mobil home park south of the site and properties on both sides of Main Street south of the site are on the municipal water system. The majority of the remaining properties are topographically higher to the west. Based on the observed direction of groundwater flow, the nearest potential surface water receptor is the Connecticut River to the east of the site.

In summary, four (4) shallow groundwater monitoring wells were installed on the site and sampled. Results from the tank closure assessment, boring program, and water quality sampling indicate that a release of petroleum product has occurred on the property. The primary contaminant is gasoline with fuel oil or diesel also present based on odor. Naphthalene was found in three of the wells; MW-1, MW-2, and MW-4.

Benzene and Total Xylenes concentrations in MW-1 exceed the State of Vermont Groundwater Enforcement Standards by a factor of approximately 4. The plume is currently on-site and confined to a relatively small area surrounding the former tank location west of the building. Sounding data from the monitoring wells indicates the direction of groundwater flow is in a southeasterly direction. As a result, the plume has probably migrated under some of the building, but has not yet reached the location of MW-3 and MW-4.

Remediation of groundwater is not recommended at this site because of the limited extent of Benzene migration and the municipal water supply to surrounding properties. It is recommended that the monitoring wells be resampled twice, on a quarterly basis. This will serve to confirm the results of the initial sampling round and help gage the effect of the seasonal high water table.

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A preliminary estimate has been made for the cost to remediate petroleum contaminated soil in the vicinity of the former tanks. Because gasoline is the primary contaminant and the effected area is limited, off-site remediation by asphalt batching is a viable option. Soil would be excavated until PID readings are less than 20 ppm. The estimated volume to be excavated is 450 cubic yards. The estimated cost for excavation, transportation, laboratory analyses, disposal, and replacement of excavated soil is approximately \$55,000. One to two days of additional field work would be required to better define the limits of contaminated soil. Supporting calculations will be found in Attachment G.

In his letter to you dated January 10, 1994, Mr. Chuck Schwer of the Vermont Sites Management Section (SMS) stated that the site is covered by the Vermont Petroleum Cleanup Fund. To ensure eligibility for reimbursement under the Fund, all work on the site will require approval by the SMS prior to initiation.

We trust this brief report provides the information you and the SMS require to further evaluate this site. With your approval, we will submit a copy of this report to the State on your behalf. If you have any questions regarding our findings or recommendations, please do not hesitate to contact us.

Respectfully submitted,

DUFRESNE-HENRY, INC.

Bruce H. Cox, P.E.
Environmental Services Division

BHC/dim

Enclosures

cc: Chuck Schwer, SMS

ATTACHMENT A
SITE HEALTH AND SAFETY PLAN
AND
WORK PLAN

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

HEALTH AND SAFETY PLAN
FOR

PHASE I PETROLEUM CONTAMINATION INVESTIGATION

FORMER KNOX & SONS

WINDSOR, VERMONT

This Health and Safety Plan applies only to Dufresne-Henry, Inc. employees.

PROPOSED ON-SITE ACTIVITIES:

Installation of three (3) or four (4) shallow groundwater monitoring wells,
decontamination of drill tools, and sampling.

PROPOSED DATE(S) OF WORK: Borings: March 24 - 25, 1994
Sampling: Week of March 28, 1994

ANTICIPATED WEATHER CONDITIONS: temperatures in the 20's - 50's, possible snow
or rain, light wind.

PROPOSED SITE INVESTIGATION TEAM:

Personnel	Responsibilities
Bruce Cox	Project Manager
Bruce Cox	Site Safety Officer
Bruce Cox/Oscar Garcia	Field Team Leader (Borings/Sampling)
William Smith (Conn. River Bank)	Site Representative
Chuck Schwer	ANR Representative

All Dufresne-Henry, Inc. personnel arriving or departing the Site should check
in and out with the Site Safety Officer. All Dufresne-Henry activities
on-Site must be cleared through the Field Team Leader or Project Manager.

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

Background Information

Site Status: Active Inactive Unknown

Site Description:

The former Knox & Sons site is an abandoned tree service company located on U.S. Rte 5 in Windsor, Vermont. The site consists of a single building. The existence of above- and below ground utilities is not known at this time. The site is relatively flat.

The area of known contamination is from leakage or spillage from one or more UST's formerly located on the west side of the building. Additional details will be found below.

Dig Safe was contacted on March 21, 1994. The site will be marked by 3:15 pm March 23, 1994. The Dig Safe # is 941201293.

Site History:

The history of the site is not known at this time. The site was occupied, until recently, by Knox & Sons. Knox & Sons was in the tree service business.

Field Monitoring or Sampling Data From Previous Site work:

A tank removal assessment was performed by Dufresne-Henry on December 17, 1993. At that time three (3) UST's were removed; a 500 gallon diesel, a 500 gallon gasoline, and a 1,000 gallon #2 heating oil. HNU readings were obtained from headspaced soil samples in all three tank beds; 170 ppm from the diesel tank, 200 ppm from the #2 heating oil tank, and 50 ppm from the gasoline tank. A strong gasoline odor was noted at the time. No perforations were found in any of the tanks. The excavations were backfilled with existing material. Three test pits were excavated in the vicinity of the tanks. Indications were that the contamination might be limited.

No other site investigation work is known.

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

HAZARD REFERENCE

Waste Types:

Liquid Solid (soil) _____ Sludge Vapor _____ Unknown

Waste Characteristics:

_____ Corrosive Ignitable _____ Radioactive
 Volatile _____ Toxic _____ Reactive
_____ Unknown _____ Other _____ Persistent

Specific Substances of Greatest Concern (if known): Gasoline, diesel oil, #2 heating oil.

Hazard Evaluation:

Task: Mon. Well Installation Low _____ Medium _____ High

Identification of Hazards: Gasoline, diesel oil, #2 heating oil.

Task: Decon. Low _____ Medium _____ High

Identification of Hazards: Gasoline, diesel oil, #2 heating oil.

Task: Sampling Low _____ Medium _____ High

Identification of Hazards: Gasoline, diesel oil, #2 heating oil.

Task: _____ Low _____ Medium _____ High

Identification of Hazards:

Other Physical Hazards: (weather, heavy equipment, site structures...)

Drill rig, traffic, weather

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

Hazard Assessment:

OVERALL HAZARD: Serious Moderate Low
 Unknown

On-Site Control

Site control is necessary to minimize potential exposure of workers to hazardous waste/materials, protect the public from the Site's chemical and physical hazards, and to facilitate work activity. The procedures to be followed involve the establishment of Site work zones, Site security, and safe work practices.

The on-Site staging area and support zone has been established at:

The former Knox & Sons building.

The personal contamination reduction zone (decon area) has been established at:

The site of the former tanks.

During the intrusive work, the exclusion area will be defined as follows:

The drill rig and a 15 foot radius around the borehole.

The decontamination of sampling and/or heavy equipment will be conducted:

At the site of the former tanks.

These sub-regions of on-Site control have been established in order to reduce the potential cross contamination and proliferation of contamination by potentially contaminated equipment and personal protective equipment.

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

SITE ACTIVITIES

Required Personal Protective Equipment (PPE)

<u>Task</u>	<u>Entry Level of Protection</u>	<u>Monitoring Equipment</u>	<u>Upgrade/Downgrade Contingency</u>
Well Install.	D	HNU PI-101 Explosimeter O2 meter H2S meter	Upgrade to Level C with HNU readings over 10 ppm for 5 minutes in breathing space.
Decon.	D	"	"
Sampling	D	"	"

Note: Breathing space HNU readings of 50 ppm, explosimeter readings over 25% of the LEL, O2 deficiency or enrichment, or H2S readings will result in shutting down the job and consulting with State officials and the client.

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

Decontamination and Disposal

Personnel Decontamination Procedure:

- _____ Level C: Slush boot and glove wash, slush boot and glove rinse, tape removal, outer glove removal, (cartridge change), slush boot removal, suit removal, inner glove removal.
- _____ Modified Level D: Slush boot and glove wash, slush boot and glove rinse, slush boot removal, suit removal, glove removal.

Equipment Decontamination:

The drill rig and tools will be decontaminated by steam cleaning prior to the start of work and between borings. All decontamination will be done on-site. Routine washing of split spoon samplers, etc will use water obtained at the facility or brought by the boring contractor, with disposal on-site.

Disposal Procedure for Investigation-Derived Materials:
(decon waste, disposables)

All decon waste and disposables will remain on-site.

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JOB NO.: 414010

SITE OPERATING PROCEDURES/SAFETY GUIDELINES

- ** Always observe the buddy system. Never enter or exit site alone, and never work alone in an isolated area. Never wander off by yourself.
- ** Always maintain a line-of-sight.
- ** Practice contamination avoidance. Never sit down or kneel, never lay equipment on the ground, avoid obvious sources of contamination such as puddles, and avoid unnecessary contact with on-site objects
- ** No eating, drinking, or smoking outside the designated "clean" zone.
- ** In the event PPE is ripped or torn, work shall stop and PPE shall be removed and replaced as soon as possible.
- ** Be alert to any unusual changes in your own condition; never ignore warning signs. Notify Health and Safety Coordinator as to suspected exposures or accidents.
- ** A vehicle will be readily available exclusively for emergency use. All personnel going on-site shall be familiar with the most direct route to the nearest hospital.
- ** In the event of direct skin contact, the affected area shall be washed immediately with soap and water.
- ** Copies of the Health and Safety Plan shall be readily accessible at the command post.
- ** Note wind direction. Personnel shall remain upwind whenever possible during on-site activities.
- ** Never climb over or under refuse or obstacles. Use safety harness/safety lines when sampling lagoons, stream beds, and ravines with steep banks.
- ** Hands and face must be thoroughly washed before eating, drinking, etc.
- ** Any modifications to this safety plan MUST be approved by the Site Safety Officer.

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

Special Procedures:
Confined Space Entry

No attempt will be made to enter abandoned buildings, manholes, tanks, or any other confined areas.

Other:

Personnel Monitoring: (If applicable: Heat stress, frostbite, air sampling of individual breathing zone)

Monitoring of individual breathing space will be monitored by an HNU PI-101, explosimeter, O2 meter, and H2S meter as outlined in monitoring procedures. Monitoring of weather related hazards will be as required by ambient conditions.

EMERGENCY SITUATIONS

The following standard emergency procedures will be used by Dufresne-Henry on-site personnel. The Site Safety Officer (SSO) shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

Personnel Injury to Dufresne-Henry Employees in the Exclusion Zone

Upon notification of an injury to a Dufresne-Henry employee in the exclusion zone, a rescue team will enter the zone (if required) to remove the injured person to the hotline. The SSO and Project Manager should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the support zone. The SSO shall arrange for appropriate first aid, and contact should be made for an ambulance and with the designated medical facility (if required). No Dufresne-Henry personnel shall re-enter the exclusion zone until the cause of the injury or symptoms are determined.

Personnel Injury to Dufresne-Henry Employees in the Support Zone

Upon notification of an injury to a Dufresne-Henry employee in the support zone, the Project Manager and SSO will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with the on-site Field Team Leader initiating the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, all Dufresne-Henry personnel shall move to the decon line for further instructions. Dufresne-Henry activities on-site will cease until the added risk is removed or minimized.

Fire/Explosion

Upon notification of a fire or explosion on-site, all Dufresne-Henry personnel will assemble at the decon line. The fire department shall be alerted and all Dufresne-Henry personnel moved to a safe distance from the involved area.

Personal Protective Equipment Failure

If any Dufresne-Henry site personnel experience a failure or alteration of protective equipment that effects the protection factor, that person and his/her buddy shall immediately leave the exclusion zone. Re-entry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure

If any other equipment on-site fails to operate properly, the Project Manager and SSO shall be notified and then determine the effect of this failure on continuing operations on-site. If the failure affects the safety of on-site Dufresne-Henry personnel or prevents the completion of the tasks, all Dufresne-Henry personnel shall leave the exclusion zone until the situation is evaluated and appropriate actions taken.

In all situations, when an on-site emergency results in evacuation of the exclusion zone, Dufresne-Henry personnel shall not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Dufresne-Henry personnel have been briefed on any changes in the Site Safety Plan.

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

EMERGENCY INFORMATION

AMBULANCE: Windsor Phone: (802) 674 - 2112

HOSPITAL: Mount Ascutney Hospital Phone: (802) 674 - 6711
County Road
Windsor, VT
(see attached map)

POLICE: Phone: (802) 674 - 2183

FIRE DEPARTMENT: Phone: (802) 674 - 2112

POISON CENTER: Burlington Phone: (802) 658 - 3456

ANR INCIDENT RESPONSE: Office Phone: (802) 241 - 3888

CORPORATE:

Dufresne-Henry N. Springfield, VT Phone: (802) 886-2261

Project Manager: Bruce Cox

NEAREST PHONE:

LOCATION OF ON-SITE FIRST AID KIT:

EMERGENCY VEHICLE: The designated emergency vehicle on-site shall be that of the Dufresne-Henry, Inc. representative.

PROJECT: FORMER KNOX & SONS
JOB NO.: 414010

The following individuals have read this safety document and are familiar with its contents, site conditions, and on-site safety procedures (please sign below):

	<u>Company</u>
<u>Bruce Cox</u>	<u>Dufresne-Henry, Inc.</u>
<u>Oscar Garcia</u>	<u>Dufresne-Henry, Inc.</u>
<u>Myron Domingue</u>	<u>M & W Soils Engineering, Inc.</u>
<u>Richard Holmes</u>	<u>M & W Soils Engineering, Inc.</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Copies of this SSP have been given to:

Approval Signatures:

PM _____
Div. Dir. _____

20 000 FEET (VT.)

25' 709

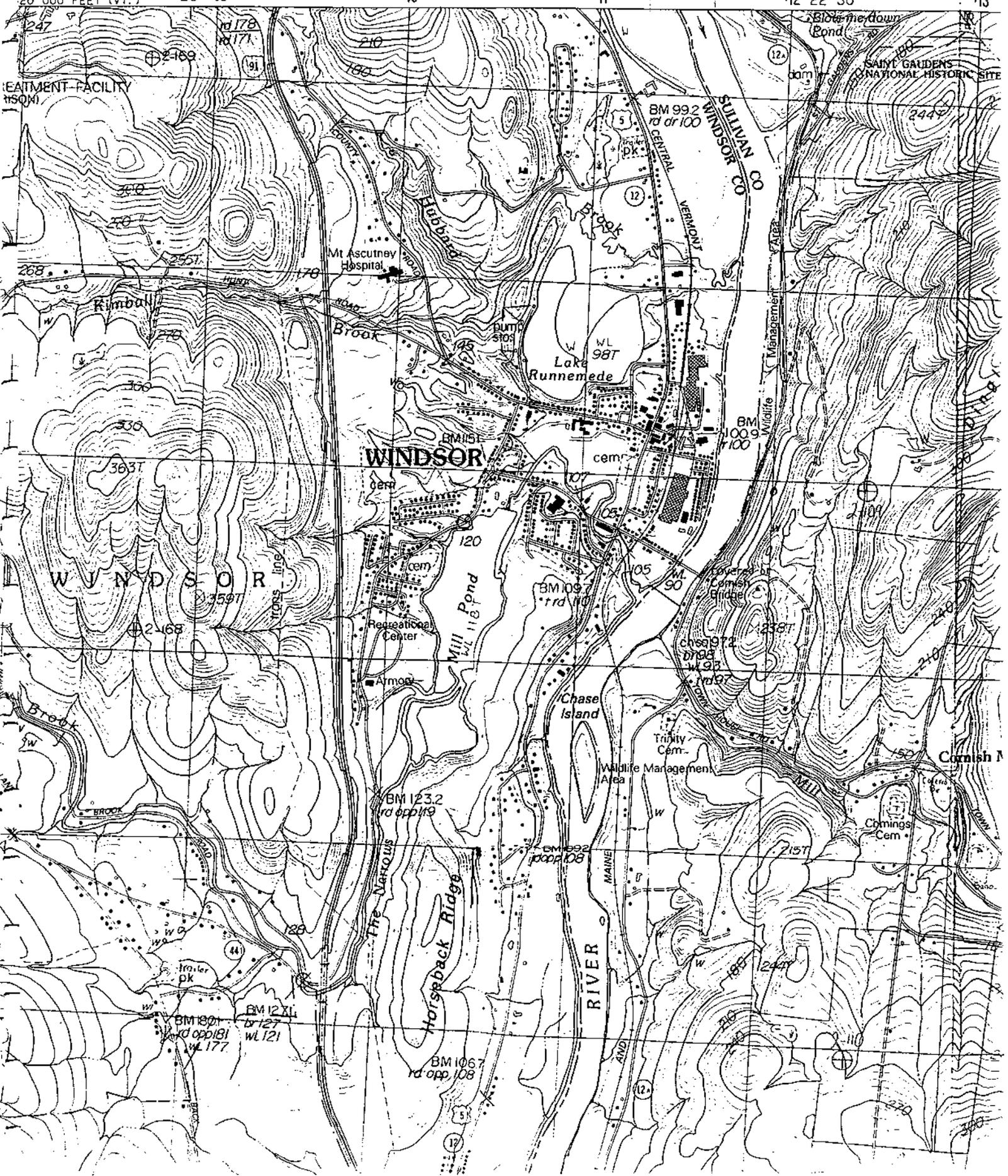
710

711

712 22' 30"

713

EATMENT FACILITY
150W1



SAINT GAUDENS
NATIONAL HISTORIC SITE

Mt Ascutney
Hospital

WINDSOR

Lake
Runnede

WINDSOR

Chase
Island

Cornish

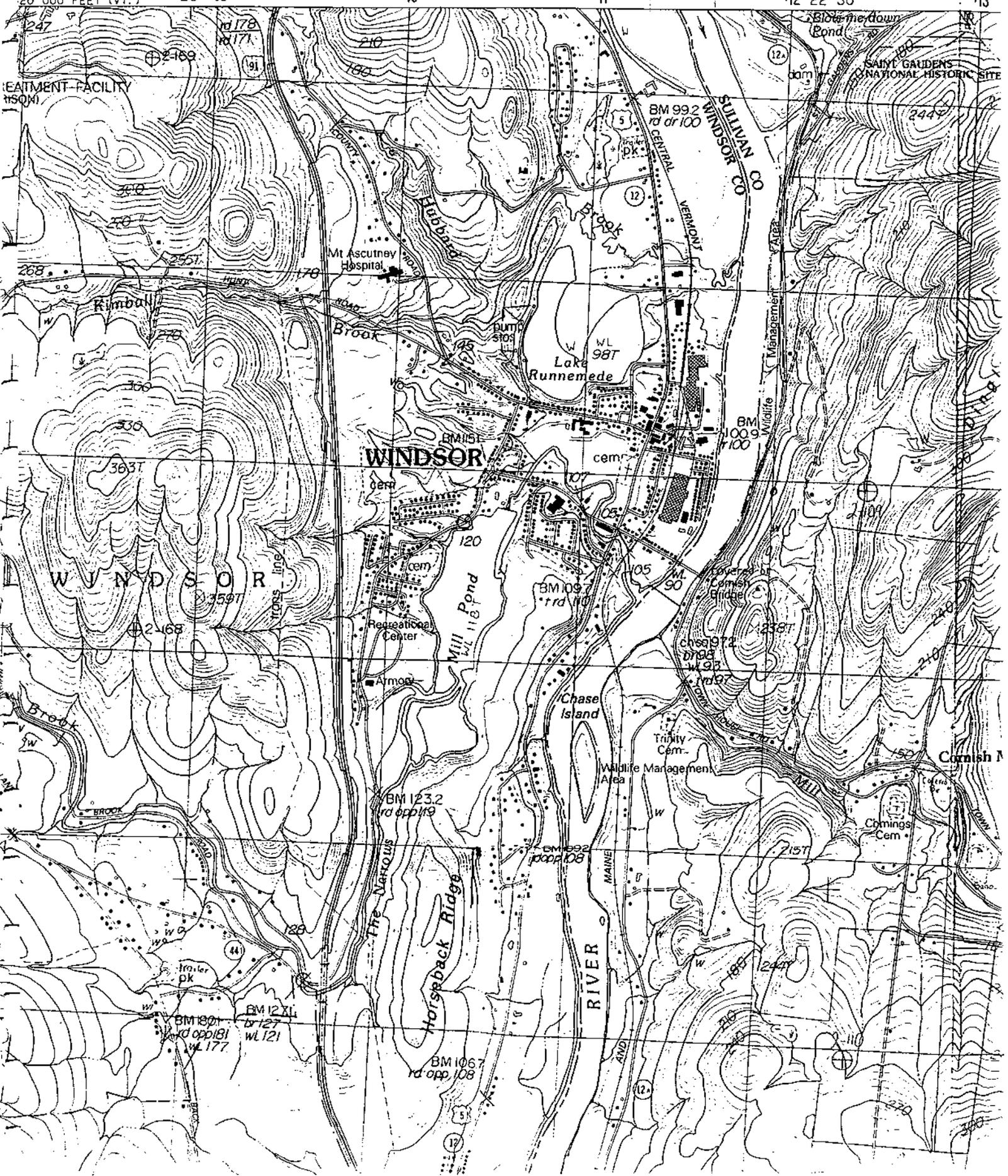
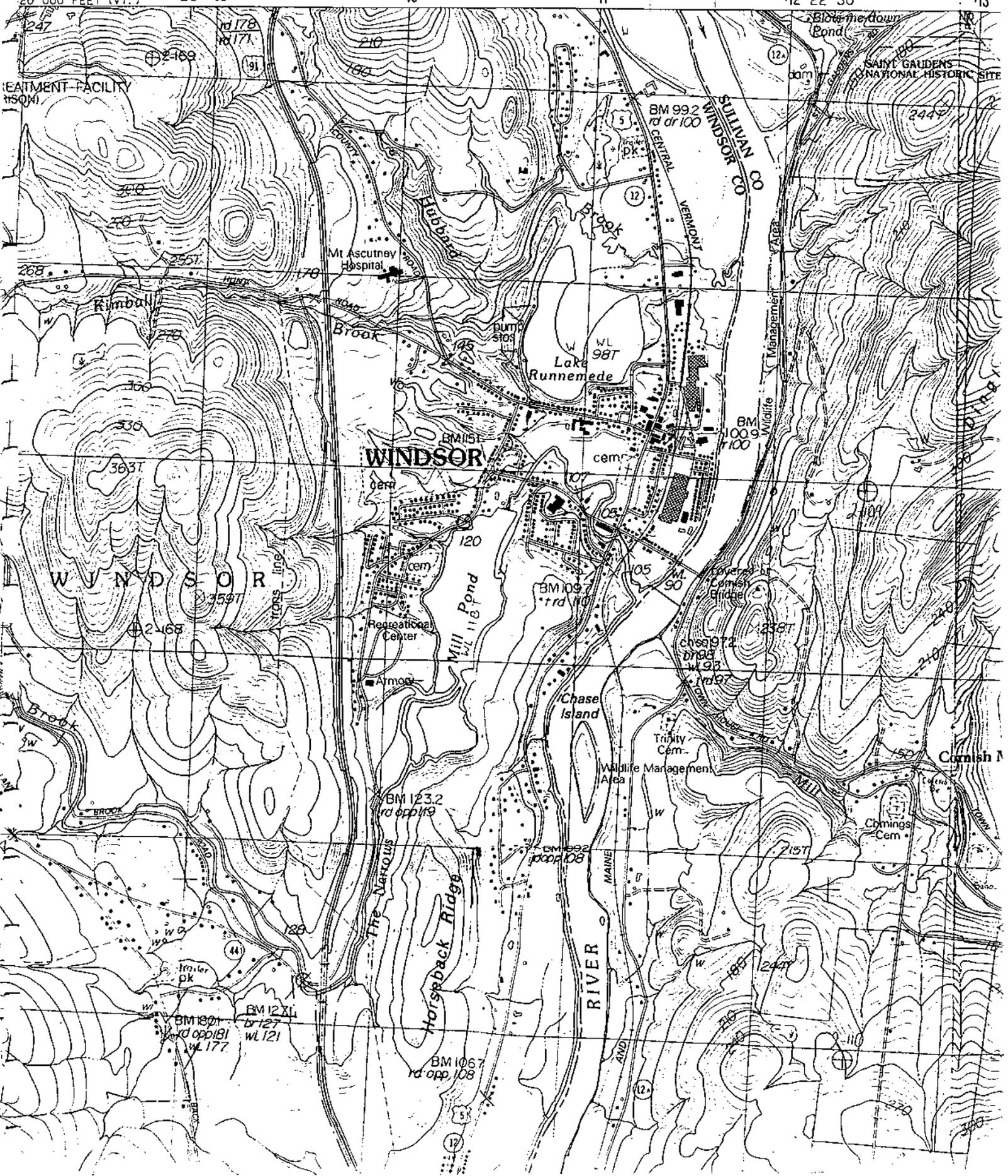
Recreation
Center

Wildlife Management
Area

Chmings
Cem.

Horseback
Ridge

MAINE
RIVER



Proposed Work Plan
Phase I Petroleum Contamination Investigation

KNOX & SONS
WINDSOR, VERMONT

This work plan outlines the boring and monitoring well program for the Phase I Petroleum Contamination Investigation at the Knox & Sons site in Windsor, Vermont. Contaminated soil was discovered at the site during a tank closure assessment. Three underground tanks were removed; one 500 gallon diesel fuel, one 1,000 gallon #2 heating oil, and one 500 gallon gasoline. PID readings of up to 200 ppm were observed from headspaced soil samples. Stained soil was observed around distribution piping. Groundwater was encountered at approximately ten feet. All soils were backfilled pending the results of additional investigations.

The proposed monitoring wells will be used to define the extent of the contamination plume and provide basic hydrogeologic data. It is anticipated that a minimum of three (3) shallow wells will be installed with a maximum of ? (?) wells possible depending on conditions encountered. Wells may not be installed in all borings. A site sketch of approximate proposed boring/well locations will be found attached. All borings and monitoring well installations will be performed by Soils Engineering, Inc. of Charlestown, New Hampshire under the field supervision of Dufresne-Henry personnel. All field personnel are OSHA certified for hazardous site operations under 29 CFR part 1910.120.

BORINGS

It is anticipated that the borings for the monitoring wells will be done using 4 1/4" hollow stem augers. Hollow stem augers offer the advantages of minimal hole caving, ease of geologic sampling, and relatively easy monitoring well installation. They generally are the most cost effective method given the expected subsurface conditions. Monitoring well borings will be taken to a depth of approximately 5' into the prevailing groundwater table or to refusal, whichever occurs first. It is expected that the wells will be approximately 15 deep. Petroleum based pipe dope for use on drill rods, tools, or casing will not be allowed. No type of drilling mud, including polymers, will be used. Should flowing sands be encountered, clean water obtained locally will be used to increase hydraulic head. If flowing sands are particularly problematic, casing will be used.

SOIL SAMPLING

Soil samples will typically be taken at 5 foot intervals using a split spoon sampler. Sampling at other intervals may occur and will be a field decision of the Dufresne-Henry inspector. Possible reasons include abrupt changes in drill rate and suspected, or known, zones of contamination. The boring in the tank excavation will be sampled continuously to obtain accurate data on the vertical extent of the plume. The split spoon sampler allows retrieval of relatively undisturbed soil samples from a known depth for classification and Volatile

Organic Compound (VOC) screening. All soil samples and material from the auger flights will be screened for VOC's by headspace analysis with an HNU HW-101 photoionization detector (10.2 eV lamp, calibrated with isobutylene). The act of driving the sampler (Standard Penetration Test) also gives an indication of the density or degree of compaction of the soil. Representative samples from each spoon will be placed in glass jars and retained by Dufresne-Henry. These are for project records only and are not intended for chemical analysis. Detailed logs of geology, drilling data, HNU readings, and monitoring well installation will be prepared for each boring. Soil samples for laboratory analysis may be obtained as part of this project. Water quality samples will not be obtained during the boring program.

MONITORING WELLS

Monitoring wells will be constructed from 2", 0.020" machine slotted, threaded, flush joint, Schedule 40 PVC. Assuming no refusal, each monitoring well will consist of 10' of screen with sufficient riser to reach approximately 2" below the surface grade. The bottom of the well will be set such that approximately 5 feet of screen extends above and below the water table observed at the time of installation. For wells with shallow depth to the water table, the screened interval will be a decision of the Dufresne-Henry inspector. The bottom of all wells will be provided with a PVC cap or point or a plug with an expanding gasket. The annular space between the auger and the screen will be carefully backfilled with clean silica sand to create a filter pack around the well. The filter pack will extend from the bottom of the well to approximately 2 feet above the screen. At that point a seal will be installed consisting of about 1 foot of bentonite pellets. The remainder of the hole will be backfilled with native soil to about 2 feet from the surface. Another bentonite seal will be installed and a protective monitoring well box will be grouted in flush at the surface or a stick-up steel casing installed depending on the location. All wells will have removable top caps for sampling and sounding.

DECONTAMINATION

The borings may, or may not, be completed within the zone of contamination. However, to prevent cross contamination between the borings, strict decontamination procedures will be followed. All in-ground tools and equipment will be decontaminated by steam cleaning prior to the start of work and between borings. All decontamination will be done on-site at a designated location. Routine cleaning of equipment, such as split spoons, will use water obtained at the site and a product such as Alconox. Disposal of waste will be at the site. Excess contaminated soil will be stockpiled on-site. The soil will be placed on 6 mil polyethylene sheeting and covered with the same material.

RECEPTOR PLAN

A field investigation will be performed to identify potential receptors including nearby water supply wells and surface water. The basement of the Knox & Sons building and other nearby buildings, if any, will be screened with the HNU as deemed necessary.

WATER SAMPLING

Water quality samples will be obtained from all Dufresne-Henry installed monitoring wells following a period of stabilization. Samples will also be obtained from the tap in the Knox & Sons building and any other nearby drinking water supplies identified during the receptor study. The samples will be taken by Dufresne-Henry personnel. Protocols for the sampling are on an attached document. Samples will not be obtained from any well exhibiting free product. The samples will be analyzed for VOC's (BTEX & MTBE) by EPA Method 8020 by Eastern Analytical, Inc. in Concord, New Hampshire. Standard turnaround time for analysis results, approximately 2 weeks, will be requested unless otherwise directed.

REPORTING

A verbal report of field findings will be made to the HMMD SMS immediately following boring installation. A letter report including a sketch indicating the boring locations and observed limits of contamination will follow within 30 days of the completion of well installation. Included will be recommendations for additional investigations or remediation. Water quality results will follow upon their receipt.

WATER QUALITY SAMPLING TECHNIQUES

Quality Assurance Document

Introduction

Sample collection for groundwater monitoring wells is performed with polyvinyl chloride (PVC) bailers for samples which are analyzed for inorganic parameters, and by Teflon bailers for organic parameters. Surface water samples are hand grab samples. All samples are collected in suitable containers and refrigerated and/or field preserved as appropriate until delivered to a certified laboratory for analysis. Samples are delivered to the laboratory as soon as possible and in all circumstances within the recommended delivery time for specific parameters. A Chain of Custody record is kept for each sample location and sampling occurrence.

Monitoring Wells

The casing and well guard are inspected for signs of vandalism or damage. The condition of the ground surface at the well head is examined for signs of surface water infiltration. Information regarding condition is noted as well as information regarding identification of the lock and key. Well casing diameter is noted. Weather conditions are noted as well as any recent rainfall or drought conditions.

Upgradient wells ("clean") are sampled prior to downgradient wells. Static water level is determined using an electronic water sounder or a tape and weight with an accuracy of ± 0.01 foot. Measurements are recorded to the nearest 0.02 foot from the top of the protective steel casing or monitoring well casing. The PVC bailer is washed with a non-ionic phosphate free detergent and rinsed with distilled water. The depth to the bottom of the well is determined and the volume of water required for purging is calculated. A minimum of three volumes of static water in the well is purged. The purged water is discarded. Teflon bailers are used for sample collection. The Teflon bailers are washed with detergent and rinsed with distilled water between sampling locations.

The color, odor, and turbidity of the sample is noted. Samples are obtained for parameters required for the specific well. An example of the parameters typically obtained immediately after the well has been flushed are: chemical oxygen demand (COD), chloride, and site specific metals. Samples may also be obtained for nitrates, calcium, manganese, sulfates, total organic compounds, total halogenated organic compounds, and volatile organic compounds. If volatile organic analysis (VOA) is required, these samples are obtained first. The VOA sample is slowly released into a clean VOA vial with as little disturbance to the sample as possible. The vial cap is retained in the hand during the process with the Teflon seal protected from all contamination. No free gases are permitted in the sample.

All samples which will be analyzed for dissolved metals and COD are field filtered using a pressurized 0.45u filter. Samples are placed in containers provided by the certified laboratory and labeled with an identification number, date, and method of preservation.

Surface Water Sampling

Hand grab samples are collected at surface water sampling locations. Samples are obtained from mid-depth of the water column in a field cleaned sampling device. Samples which will be analyzed for dissolved metals, COD, and which have observable turbidity are filtered with a 0.045u filter and immediately preserved. Field parameters of temperature, pH, and specific conductance are also measured in the water column. Conditions in the vicinity of the sampling location are noted, depth of sample below water surface, and general flow conditions.

Sample Preservation and Handling

Samples collected which require fixing with preservative chemicals are placed in sample containers with the appropriate reagent. The samples are placed in insulated chests with ice packs or ice. Samples are kept refrigerated until they are delivered to the laboratory no later than allowable according to the holding times determined by Standard Methods. Sampling personnel contact the laboratory personnel regarding sampling delivery and analysis.

Record Keeping

Field data sheets are utilized to reconstruct sampling conditions at any time after sampling. These sheets shall contain all information regarding the site: name, date, time of sampling, weather, ambient air temperature, identification numbers, and sampler's name. Field data is to include information regarding the condition of the well head and casing, well specifics (total depth, static water level, diameter, length of casing above grade, volume of water purged), sampling date (equipment used, depth sample obtained, physical properties of sample), field measurements of pH, conductivity, temperature, and the number and type of sample containers.

Chain of custody record for all samples shall be maintained. A sample shall be considered to be in the custody of an individual if it is in the direct view of, or otherwise controlled by, the individual in custody. Storage of samples during custody shall be accomplished according to established preservation techniques in appropriately sealed and numbered storage containers. Chain of custody shall be maintained during the exchange of the samples or sealed sample container directly transferred from one individual to the next with the former custodian witnessing the signature of the recipient on the chain of custody record. Chain of custody forms shall contain the following information: sample location names, field identification numbers, signature of collector, date and time of collection, number of containers transferred, parameters for analysis, all signatures of individuals involved in the chain of possession, description of sample condition, and any comments regarding sample collection.

Quality Assurance and Control

To check the integrity of field sampling and equipment cleaning techniques, the following field control procedures are used. Field blanks, and occasionally trip blanks, are used as control or external QA/QC samples to detect contamination that may be introduced in the field (atmospheric or from sampling

equipment), in transit to or from the sampling site, during bottle preparation, and sample log-in or storage.

A "field blank" is collected after sampling a well that previously indicated high concentrations of the water quality parameters analyzed. The sampling equipment is cleansed and a sample of distilled water is obtained using the sampling equipment. The distilled water sample is then used to prepare the field blank.

A sample replicate is used periodically to provide quality assurance for the laboratory analysis techniques. A sample is split in the field and provided to the laboratory in two or more sampling containers.

Decontamination of Field Equipment

All field equipment is rinsed with de-ionized or distilled water. This includes the electronic water sounder probe, the bailer winch spool, Teflon coated bailer wire, filter unit, and bailers. In addition, the bailers are disassembled, washed with a non-phosphate detergent, and rinsed with pressurized distilled water.

Site Health and Safety

All sampling personnel shall receive an annual medical examination to determine the baseline physiological condition. Appropriate blood chemistry work and x-rays are taken as required.

Protective clothing is worn by all site technicians during sampling. This clothing includes protective rubberized overalls, rubber gloves, and steel-toed boots. Full-face respirators with organic filter cartridges, combustible gas and oxygen detection meters, and photoionization detectors are available for the sampler's protection.

Upon arrival at the site a visual survey is performed to determine the safety of the work place. No water quality testing is performed if there is any evidence of hazardous waste disposal or the uncovering of suspected hazardous materials. Upon arrival at a monitoring well location, the cap is removed from an upwind position. The well head is allowed to vent for at least five minutes while sampling equipment is set up. No smoking or use of flammable materials is permitted adjacent to a well head.

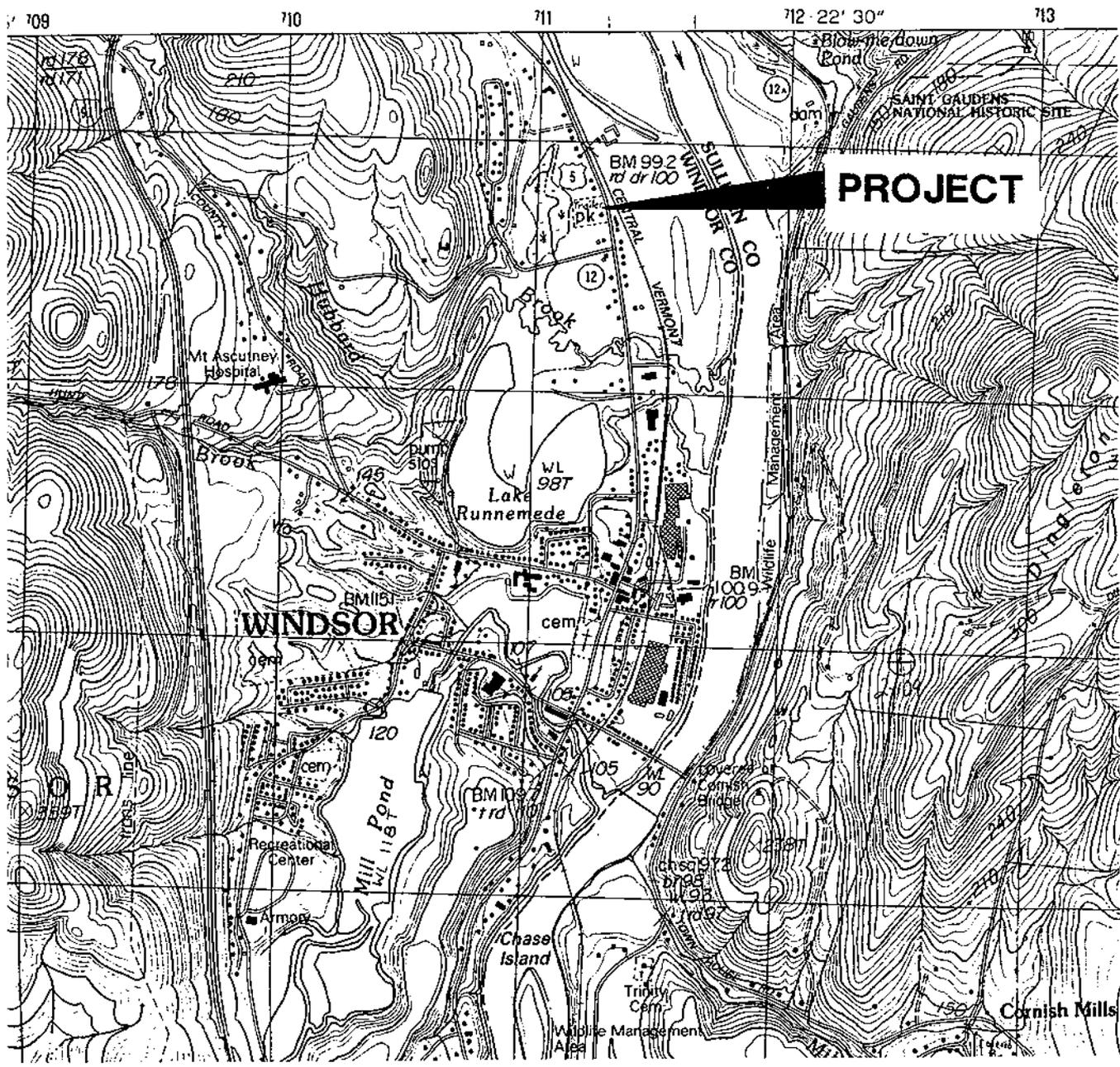
Data Transaction, Reduction and Report Generation

Data analysis and interpretation are the responsibility of the Project Manager or Project Team member responsible for a particular task of the project. The data are compiled in table form for ease of presentation to highlight the significant information. The data may be input into the computer and plotted on various types of graphs and maps, or analyzed by various statistical methods.

Sampling Protocol Addendum for: Knox & Sons
Windsor, Vermont

1. The person(s) sampling the wells will utilize an HNU photoionization detector. Immediately upon removal of the well cap, the HNU will be used to make a preliminary determination as to the VOC activity in the well.
2. A Teflon bailer will then be lowered into the well to check for the presence of free product floating on the groundwater surface. If free product is found, the well will be purged until product ceases to be observed. Product will be stored in a container that will remain on-site. The well will be allowed to recover and be repurged and checked for free product. If free product is again observed, no water quality samples will be taken. If free product is not observed, the well will be sounded, purged, and sampled as outlined above.
3. Water samples will be forwarded to a contract laboratory. Analysis will be for Volatile Organic Compounds including "BTEX" and MTBE by EPA Method 8020.

ATTACHMENT B
SITE LOCATION MAP



LOCUS PLAN
 APPROXIMATE SCALE 1:25000

TAKEN FROM USGS QUAD SHEET FOR MT. ASCUTNEY, VERMONT - NEW HAMPSHIRE

DH
 Dutton-Harry, Inc.
 Precision Park
 No. Springfield,
 Vermont 05150
 Tel. (802)886-2261 Fax (802)886-2260

CONNECTICUT RIVER BANK
FORMER KNOX AND SONS
WINDSOR, VERMONT

Project No.	414010
Proj. Mgr.	B.H.C.
Date	4/94
A	1

ATTACHMENT C

SITE SKETCH



NORTH

PROPERTY LINE

PROPERTY LINE

U.S. ROUTE 5

NORTH MAIN ST.

TB-1



MW-2



MW-1



OFFICE

MW-4



MW-3



PROPERTY LINE

DRIVEWAY TO MOBILE HOME PARK

SCALE: 1" = 50'

DH
 Duffins-Harry, Inc.
 Precision Park
 No. Springfield,
 Vermont 05150
 Tel. (802)886-2261 Fax (802)886-2260

PHASE 1 PETROLEUM CONTAMINATION INVESTIGATION
 FORMER KNOX AND SONS
 SITE PLAN

WINDSOR,

VERMONT

Project No.	414010
Proj. Mgr.	B.H.C.
Date	5/94
A	1

ATTACHMENT D

BORING LOGS
AND
MONITORING WELL INSTALLATION REPORTS

BORING LOCATION MW-1		INCLINATION V		BEARING		DATE START/FINISH 3/24/94 / 3/24/94				
CASING ID		CORE SIZE		TOTAL DEPTH 17 FT		DRILLED BY: SOILS ENGINEERING, INC. (M.D.)				
GROUND EL (AD) 495.50		DEPTH TO WATER/DATE 2.80 FT/ 3/29/94		LOGGED BY: B. COX						
ELEV AD FT	SAMPLE			SAMP OD IN	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION	
	DEPTH FT	TYPE AND NO.	B		REC IN	PENETRATION IN				
494.50	1						4 1/4" HSA	8"/CCH	Medium brown and gray sandy GRAVEL.	
492.5	3	SS-1	10* 12* 14* 8	2	20	24	* frozen soil		Medium - dark gray, sandy SILT. Very fine grained sand. 80%+ non plastic inorganic fines. Very moist. Saturated. Slight gasoline and oil odor. 9 ppm (from partially frozen sample).	
490.50	5	SS-2	4 4 4 4	2	12	24			Medium - dark gray, loose sandy SILT similar to above. Non - slightly plastic fines. Saturated. Oily odor, no staining. 4 ppm.	
488.50	7	SS-3	1 2 2 1	2	8	24			Medium - dark gray, very loose - loose, sandy SILT similar to above, but slightly sandier. Saturated Moderate gasoline and oil odor, no staining. 150 ppm.	
486.50	9	SS-4	2 2 2 1	2	24	24			Medium - dark gray, very loose - loose, silty SAND Very fine - fine grained, well sorted sand. 40%+ non plastic fines. Saturated. Moderate - strong gasoline and oil odor, no staining. 120 ppm.	
484.00	11.5	SS-5	1 1*	2	24	30	* 1/12" * 1/12"		Medium gray brown, very loose, silty SAND. Very fine - rarely medium grained, moderately well sorted sand. 20% - 30% non plastic fines. Trace mica. Saturated. Slight pesticide-like (?) odor. 32 ppm.	
482.00	13.5	SS-6	1 1 3 3	2	20	24			Medium brown gray, loose, silty SAND similar to above, but slightly coarser. Trace mica. Saturated. No odor or staining. 6 ppm.	
480.50	15						4 1/4" HSA	8"/CCH	Probable silty SAND similar to above.	
478.50	17	SS-7	1* 1 2	2	12	24			Medium - dark gray, very loose, silty SAND similar to above, but coarser. Very fine - medium grained, moderately poorly sorted sand. 20%+ non plastic fines. Saturated. No odor or staining. 7 ppm.	
									No refusal to depth. Set 10' of 2" dia, .020" slot, threaded, flush joint, Schd 40 PVC at 14'7". Sand backfill to 2'. Bentonite seal 1' - 2'. Grouted in flush aluminum waterproof monitoring well box.	
B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30 in to drive a split spoon sampler. REC - Length of sample recovered. SS - Split spoon sample. U - Undisturbed samples S - Shelby tube N - Denison F - Fixed piston P - Pitcher O - Osterberg SAMP OD - Outside diameter of sampling spoon							NOTES HSA = Hollow Stem Auger CCH = Conical Cutter Head ppm Refers to HNU reading (10.2 eV lamp) Top of PVC elev = 495.03		CONNECTICUT RIVER BANK FORMER KNOX & SONS WINDSOR, VERMONT DATE: 3/24/94 PROJECT: 414010	
							PAGE 1 OF 1	LOG OF BORING: MW-1		

BORING LOCATION MW-2 INCLINATION V BEARING DATE START/FINISH 3/24/94 / 3/24/94
 CASING ID CORE SIZE TOTAL DEPTH 15 FT DRILLED BY: M & W SOILS ENGINEERING, INC. (M.D.)
 GROUND EL (AD) 495.33 DEPTH TO WATER/DATE 2.55 FT/ 3/29/94 LOGGED BY: B. COX

ELEV AD FT	SAMPLE			SAMP OD IN	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION
	DEPTH FT	TYPE AND NO.	B		REC IN	PENETRATION IN			
490.33	5						4 1/4" HSA	8"/CCH	0' - 4' Medium brown and gray, GRAVEL. Moderate oil odor. 4' - 5' Medium brown gray, sandy SILT.
488.33	7	SS-1	2 2 2 3	2	24	24			Medium brown gray, loose, sandy SILT. Very fine grained sand. 70%+ non plastic inorganic fines. Trace mica. Saturated. Slight oil odor. 4 ppm.
486.33	9						4 1/4" HSA	8"/CCH	Probable sandy SILT or silty SAND similar to above
484.33	11	SS-2	1* 1*	2	24	24	* 1/12" * 1/12"		Medium - dark gray, very loose, silty SAND. Very fine - rarely medium grained, moderately well sorted sand. 20%+ non plastic fines. Trace mica. Saturated. No odor or staining. .5 ppm.
480.33	15						4 1/4" HSA	8"/CCH	Probable silty SAND or sandy SILT similar to above No sample taken due to flowing sand.
									No refusal to depth. Set 10' of 2" dia, .020" slot, threaded, flush joint, Schd 40 PVC at 15'. Sand backfill to 5'. Bentonite seal 4'2" - 5'. Grouted in flush aluminum waterproof monitoring well box.

B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30 in to drive a split spoon sampler. REC - Length of sample recovered. SS - Split spoon sample. U - Undisturbed samples S - Shelby tube N - Denison F - Fixed piston P - Pitcher O - Osterberg SAMP OD - Outside diameter of sampling spoon	NOTES HSA = Hollow Stem Auger CCH = Conical Cutter Head ppm Refers to HNU reading (10.2 eV lamp) Top of PVC elev =	CONNECTICUT RIVER BANK FORMER KNOX & SONS WINDSOR, VERMONT DATE: 3/24/94 PROJECT: 414010	
		PAGE 1 OF 1	LOG OF BORING: MW-2

BORING LOCATION MW-3 INCLINATION V BEARING DATE START/FINISH 3/24/94 / 3/24/94
 CASING ID CORE SIZE TOTAL DEPTH 16.5 FT DRILLED BY: M & W SOILS ENGINEERING, INC. (M.D.)
 GROUND EL (AD) 495.93 DEPTH TO WATER/DATE 4.60 FT/ 3/29/94 LOGGED BY: B. COX

ELEV AD FT	SAMPLE			SAMP OD IN	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION
	DEPTH FT	TYPE AND NO.	B		REC IN	PENETRATION IN			
495.43	.5						4 1/4" HSA	8"/CCH	0" - 3" Bituminous concrete pavement. 3" - 6" SAND and GRAVEL.
493.43	2.5	SS-1	8 12* 24*	2	24	24	* frost		Dark brown - black, silty, sandy, gravelly FILL. Very fine - medium grained, moderately poorly sorted sand. 20%+ non plastic fines. 20%+ fine rounded gravel. Brick at 2'±. Moist. Upper 2'± has a distinct moth ball odor. 2 - 4 ppm from borehole.
491.43	4.5						4 1/4" HSA	8"/CCH	Probable silty SAND.
489.43	6.5	SS-2	2 2 2 2	2	24	24			Medium brown, very loose - loose, silty SAND. Very fine - predominately fine grained, well sorted sand. 20% - 30% non plastic fines. Saturated at 6'. No odor or staining. 4 ppm.
486.43	9.5						4 1/4" HSA	8"/CCH	Probable silty SAND similar to above.
483.93	12	SS-3	5 1*	2	20	30	* 1/24"		Medium - dark brown, very loose, silty SAND similar to above, but slight coarser. Saturated. Moderately strong - strong moth ball odor, no staining. 8.5 ppm.
484.43	14.5						4 1/4" HSA	8"/CCH	Probable silty SAND similar to above.
479.43	16.5	SS-4	1 2 1 2	2	20	24			Medium - dark gray, very loose, silty SAND. Very fine - medium grained, moderately poorly sorted sand. 20%+ non plastic fines. Abundant mica. Saturated. No odor or staining. 8 ppm.
									No refusal to depth. Set 10' of 2" dia, .020" slot, threaded, flush joint, Schd 40 PVC at 14'6". Sand backfill to 3'. Bentonite seal 2' - 3'. Grouted in flush aluminum waterproof monitoring well box.

B - Penetration resistance, 8blows/6" of a 140 lb hammer falling 30 in to drive a split spoon sampler. REC - Length of sample recovered. SS - Split spoon sample. U - Undisturbed samples S - Shelby tube N - Denison F - Fixed piston P - Pitcher O - Osterberg SAMP OD - Outside diameter of sampling spoon	NOTES HSA = Hollow Stem Auger CCH = Conical Cutter Head ppm Refers to HNU reading (10.2 eV lamp) Top of PVC elev = 495.68	CONNECTICUT RIVER BANK FORMER KNOX & SONS	
		WINDSOR, VERMONT DATE: 3/24/94 PROJECT: 414010	PAGE 1 OF 1 LOG OF BORING: MW-3

BORING LOCATION MW-4 INCLINATION V BEARING DATE START/FINISH 3/25/94 / 3/25/94
 CASING ID CORE SIZE TOTAL DEPTH 17 FT DRILLED BY: M & W SOILS ENGINEERING, INC. (M.D.)
 GROUND EL (AD) 495.99 DEPTH TO WATER/DATE 4.30 FT/ 3/29/94 LOGGED BY: B. COX

ELEV AD FT	SAMPLE			SAMP OD IN	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION
	DEPTH FT	TYPE AND NO.	B		REC IN	PENETRATION IN			
494.99	1						4 1/4" HSA	8"/CCH	0" - 3" Bituminous concrete pavement. 3" - 1' Medium brown and gray GRAVEL.
492.99	3	SS-1	10* 19* 18* 11*	2	24	24	* frozen		Medium gray, sandy SILT. Very fine grained sand. 80%± non - slightly plastic inorganic fines. Moist. Moth ball odor. .5 ppm from partially frozen sample.
490.99	5						4 1/4" HSA	8"/CCH	Probable silty SAND or sandy SILT similar to above
488.99	7	SS-2	2 2 1 1	2	20	24			Medium - dark brown, very loose, silty SAND. Very fine - fine grained, well sorted sand. 20% - 30% non plastic fines. Abundant mica. Saturated. No odor or staining. 1.8 ppm.
485.99	10						4 1/4" HSA	8"/CCH	Probable silty SAND similar to above.
483.99	12		2 1* 3	2	0	24	* 1/12"		Probable silty SAND similar to above.
480.99	15						4 1/4" HSA	8"/CCH	Probable silty sand similar to above.
478.99	17	SS-3	1 1 2 1	2	16	24			Medium - dark gray, very loose, silty SAND. Very fine - rarely medium grained, moderately well sorted sand. 20% - 30% non plastic fines. Trace mica. Saturated. No odor or staining. 0 ppm.
									No refusal to depth. Set 10' of 2" dia, .020" slot, threaded, flush joint, Schd 40 PVC at 15'. Sand backfill to 2'6". Bentonite seal 1'6" - 2'6". Grouted in flush aluminum waterproof monitoring well box.

B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30 in to drive a split spoon sampler. REC - Length of sample recovered. SS - Split spoon sample. U - Undisturbed samples S - Shelby tube N - Denison F - Fixed piston P - Pitcher O - Osterberg SAMP OD - Outside diameter of sampling spoon	NOTES HSA = Hollow Stem Auger CCH = Conical Cutter Head ppm Refers to RNU reading (10.2 eV lamp) Top of PVC elev = 495.65	CONNECTICUT RIVER BANK FORMER KNOX & SONS	
		WINDSOR, VERMONT DATE: 3/25/94 PROJECT: 414010	PAGE 1 OF 1 LOG OF BORING: MW-4

BORING LOCATION TB-1 INCLINATION V BEARING DATE START/FINISH 3/24/94 / 3/24/94
 CASING ID CORE SIZE TOTAL DEPTH 7 FT DRILLED BY: M & W SOILS ENGINEERING, INC. (M.D.)
 GROUND EL (MSL) DEPTH TO WATER/DATE FT/ LOGGED BY: B. COX

ELEV MSL FT	SAMPLE			SAMP OD IN	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION
	DEPTH FT	TYPE AND NO.	B		REC IN	PENETRA- TION IN			
	.5						4 1/4" HSA	8"/CCH	0" - 6" Medium brown GRAVEL.
	2.5	SS-1	1 3 4 6	2	14	24			Medium gray, sandy SILT. Very fine grained sand. 80%+ non plastic inorganic fines. Saturated. No odor or staining. 0 ppm.
	5						4 1/4" HSA	8"/CCH	Probable silty SAND or sandy SILT.
	7	SS-2	2 2 2 2	2	24	24			5' - 6' Medium gray, very loose - loose, sandy SILT. Very fine grained sand. 70%+ non plastic fines. Saturated. No odor or staining. 0 ppm. 6' - 7' Medium gray, very loose - loose, silty SAND. Very fine - fine grained, well sorted sand. 40%+ non plastic fines. Saturated. No odor or staining. 0 ppm.
									No refusal to depth.

B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30 in to drive a split spoon sampler. REC - Length of sample recovered. SS - Split spoon sample. U - Undisturbed samples S - Shelby tube N - Denison F - Fixed piston P - Pitcher O - Osterberg SAMP OD - Outside diameter of sampling spoon	NOTES HSA = Hollow Stem Auger CCH = Conical Cutter Head ppm Refers to HNU reading (10.2 eV lamp)	CONNECTICUT RIVER BANK FORMER KNOX & SONS	
		WINDSOR, VERMONT DATE: 3/24/94 PROJECT: 414010	PAGE 1 OF 1 LOG OF BORING: TB-1

M & W Soils Engineering, Inc.
Main St. Charlestown, NH 03603

TO DUFRESNE-HENRY ENGINEERING ADDRESS NORTH SPRINGFIELD, VT
 PROJECT NAME KNOX TREE SERVICE LOCATION WINDSOR, VT
 REPORT SENT TO BRUCE COX PROJ. NO. _____
 SAMPLE SENT TO RETAINED BY DUFRESNE-HENRY OUR JOB NO. 5985-94

SHEET 1 OF 1
 DATE 3/24/94
 HOLE NO. MW-1
 LINE & STA. _____
 OFFSET _____

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT <u>2'2"</u>	AT <u>24</u> HOURS		HSA	SS		DATE STARTED <u>3/24/94</u>
AT _____	AT _____ HOURS	Size I. D.	<u>4 1/4"</u>	<u>1 1/2"</u>		DATE COMPL. <u>3/24/94</u>
		Hammer Wt.		<u>140#</u>	BIT	BORING FORMAN <u>M.D. & R.H.</u>
		Hammer Fall		<u>30"</u>		INSPECTOR _____
						SOILS ENGR. _____

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect.	SAMPLE					
				From 0-6	6-12	To 12-18				NO.	PEN	REC			
5'		1' - 3'	SS	10	12		WET	1'	BROWN SAND AND GRAVEL	1	24"	18"			
				14	18										
		3' - 5'	SS	4	4					FROZEN TO LOOSE GREY FINE SANDY SILT	2	24"	14"		
				4	4										
		5' - 7'	SS	1	2					SAME MATERIAL - STRONG GAS ODOR	3	24"	12"		
				1	2										
10'		7' - 9'	SS	2	2		WET	9'6"	SAME MATERIAL WITH 1" SAND LAYERS - GAS ODOR	4	24"	24"			
		9' - 11'8"	SS	1	1 1/12"								5	30"	24"
				1 1/12"											
15'		11'6" - 13'6"	SS	1	1		WET	17'	LOOSE BROWN SILTY FINE SAND	6	24"	24"			
				3	3										
20'		15' - 17'	SS	1 1/12"					GREY COLOR - SAME MATERIAL INSTALLED 2" PVC WELL AT 15' SLOTTED FROM 5'-15' WITH 0.020" SLOTSCREEN FILTER SAND TO 3' BENTONITE FROM 1'-3' MATERIALS USED: 10' OF 2" PVC 0.020" SLOT SCREEN 5' OF 2" PVC SOLID 10' OF FILTER SOCK 1 2" SLIDE CAP 1 2" EXPANSION CAP 1 8" MANHOLE COVER 225# OF SAND 25# OF BENTONITE CHIPS 40# OF CONCRETE MIX	7	24"	24"			
				1	2										

GROUND SURFACE TO 15'

USED HSA CASING THEN DROVE SS 24"

Sample Type
 D-Dry C-Cored W-Washed
 UP-Unfinished Piston
 TP-Test Pit A-Auger V-Vane Test
 UT-Undisturbed Thinwall

Proportions Used
 trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
Cohesionless Density
 0-10 Loose
 10-30 Med. Dense
 30-50 Dense
 50+ Very Dense

Cohesive Consistency
 0-4 Soft 30 + Hard
 4-8 M/Stiff
 8-15 Stiff
 15-30 V-Stiff

summary

EARTH BORING 17'
 ROCK CORING _____
 SAMPLES 7
 HOLE NO. MW-1

M & W Soils Engineering, Inc.
Main St. Charlestown, NH 03603

TO DUFRESNE-HENRY ENGINEERING ADDRESS NORTH SPRINGFIELD, VT
PROJECT NAME KNOX TREE SERVICE LOCATION WINDSOR, VT
REPORT SENT TO BRUCE COX PROJ. NO. _____
SAMPLE SENT TO RETAINED BY DUFRESNE-HENRY OUR JOB NO. 5985-94

SHEET 1 OF 1
DATE 3/24/94
HOLE NO. MW-2
LINE & STA. _____
OFFSET _____

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT <u>1'5"</u>	AT <u>20</u> HOURS		<u>HSA</u>	<u>SS</u>	_____	_____
		Size I. D.	<u>4 1/4"</u>	<u>1 1/2"</u>	_____	DATE STARTED <u>3/24/94</u>
		Hammer Wt.	_____	<u>140#</u>	<u>BIT</u>	DATE COMPL. <u>3/24/94</u>
		Hammer Fall	_____	<u>30"</u>	_____	BORING FORMAN <u>M.D. & R.H.</u>
AT _____	AT _____ HOURS				INSPECTOR _____	SOILS ENGR. _____

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect	SAMPLE		
				From 0-6	6-12	To 12-18				NO.	PEN	REC
5'		5' - 7'	SS	2	2		WET	1'	SAND AND GRAVEL			
				2	3				FROZEN TO LOOSE GREYISH BROWN FINE SANDY SILT - SLIGHT ODOR	1	24"	24"
10'		9' - 11'	SS	1/12"				7'6"				
				1/12"				GREYISH BROWN SILTY FINE SAND - NO ODOR	2	24"	24"	
15'								15'	INSTALLED 2" PVC WELL AT 15' SLOTTED FROM 5'-15' WITH 0.020" SLOT SCREEN FILTER SAND TO 4' BENTONITE FROM 3'-4'			
									MATERIALS USED: 10' OF 2" PVC 0.020" SLOT SCREEN 5' OF 2" PVC SOLID 1 2" SLIDE CAP 1 2" EXPANSION CAP 1 8" MANHOLE COVER 225# OF SAND 25# OF BENTONITE CHIPS 40# OF CONCRETE MIX			

GROUND SURFACE TO 15'

USED HSA CASING THEN

Sample Type
D-Dry C-Cored W-Washed
UP-Unfinished Piston
TP-Test Pit A-Auger V-Vane Test
UT-Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50+ Very Dense

Cohesive Consistency
0-4 Soft 30 + Hard
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff

summary	
EARTH BORING 15'	
ROCK CORING	
SAMPLES 2	
HOLE NO. <u>MW-2</u>	

M & W Soils Engineering, Inc.
Main St. Charlestown, NH 03603

TO DUFRESNE-HENRY ENGINEERING ADDRESS NORTH SPRINGFIELD, VT
PROJECT NAME KNOX TREE SERVICE LOCATION WINDSOR, VT
REPORT SENT TO BRUCE COX PROJ. NO. _____
SAMPLE SENT TO RETAINED BY DUFRESNE-HENRY OUR JOB NO. 5985-94

SHEET 1 OF 1
DATE 3/24/94
HOLE NO. MW-3
LINE & STA. _____
OFFSET _____

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT 5'6" AT 18 HOURS	Type	HSA	SS		DATE STARTED 3/24/94
	Size I. D.	4 1/4"	1 1/2"		DATE COMPL. 3/24/94
	Hammer Wt.		140#	BIT	BORING FORMAN M.D. & R.H.
AT _____ AT _____ HOURS	Hammer Fall		30"		INSPECTOR _____
					SOILS ENGR. _____

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect	SAMPLE		
				0-6	6-12	12-18				NO.	PEN	REC
5'		1' - 3'	SS	8	12		WET	2"	ASPHALT PAVEMENT	1	24"	18"
				24	54			1'	FROZEN SAND AND GRAVEL			
		4'6" - 6'6"	SS	2	2			4"	OLIVE BROWN FINE SANDY SILT WITH GRAVEL AND BRICKS - NAPHTHA ODOR	2	24"	24"
				2	2				LOOSE BROWN SILTY FINE SAND - SLIGHT ODOR			
10'		9'6" - 11'6"	SS	5	1/24"			SAME MATERIAL - NO ODOR	3	24"	18"	
15'		14'6" - 16'6"	SS	2	1			SAME MATERIAL - GREY COLOR	4	24"	18"	
				2	1		16'6"	INSTALLED 2" PVC WELL AT 15' SLOTTED FROM 5'-15' WITH 0.020" SLOT SCREEN FILTER SAND TO 4' BENTONITE FROM 3'-4'				
20'								MATERIALS USED: 10' OF 2" PVC 0.020" SLOT SCREEN 5' OF 2" PVC SOLID 1 2" SLIDE CAP 1 2" EXPANSION CAP 1 8" MANHOLE COVER 225# OF SAND 25# OF BENTONITE CHIPS 40# OF CONCRETE MIX				

GROUND SURFACE TO 14'6"

USED HSA CASING THEN DROVE SS 24"

Sample Type
D-Dry C-Cored W-Washed
UP-Unfinished Piston
TP-Test Pit A-Auger V-Vane Test
UT-Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50+ Very Dense
Cohesive Consistency
0-4 Soft 30 + Hard
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff

summary
EARTH BORING 16'6"
ROCK CORING
SAMPLES 4
HOLE NO. MW-3

M & W Soils Engineering, Inc.
Main St. Charlestown, NH 03603

TO DUFRESNE-HENRY ENGINEERING ADDRESS NORTH SPRINGFIELD, VT
PROJECT NAME KNOX TREE SERVICE LOCATION WINDSOR, VT
REPORT SENT TO BRUCE COX PROJ. NO. _____
SAMPLE SENT TO RETAINED BY DUFRESNE-HENRY OUR JOB NO. 5985-94

SHEET 1 OF 1
DATE 3/25/94
HOLE NO. MW-4
LINE & STA. _____
OFFSET _____

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT <u>6'7"</u>	AT <u>*</u> HOURS		HSA	SS		DATE STARTED <u>3/25/94</u>
*WELL COMPLETION		Size I. D.	<u>4 1/4"</u>	<u>1 1/2"</u>		DATE COMPL. <u>3/25/94</u>
AT _____	AT _____ HOURS	Hammer Wt.		<u>140#</u>	BIT	BORING FORMAN <u>M.D. & R.H.</u>
		Hammer Fall		<u>30"</u>		INSPECTOR _____
						SOILS ENGR. _____

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect.	SAMPLE		
				From 0-6	6-12	To 12-18				NO.	PEN	REC
		1' - 3'	SS	10	19			2'	ASPHALT PAVEMENT	1	24"	24"
				18	11			1'2"	BROWN SAND AND GRAVEL			
5'		5' - 7'	SS	2	2		WET	5'	FROZEN TO LOOSE OLIVE BROWN FINE SANDY SILT	2	24"	24"
				1	2							
10'		10' - 12'	SS	2	1/12*				LOOSE GREYISH BROWN SILTY FINE SAND			
				3					SAME MATERIAL - LOST SAMPLE	3	24"	*
15'		15' - 17'	SS	1	1			17'	SAME MATERIAL - GREY COLOR	4	24"	18"
				2	1							
20'									INSTALLED 2" PVC WELL AT 15' SLOTTED FROM 5'-15' WITH 0.020" SLOT SCREEN FILTER SAND TO 4' BENTONITE FROM 2'-4'			
									MATERIALS USED: 10' OF 2" PVC 0.020" SLOT SCREEN 5' OF 2" PVC SOLID 1 2" SLIDE CAP 1 2" EXPANSION CAP 1 8" MANHOLE COVER 250# OF SAND 25# OF BENTONITE CHIPS 40# OF CONCRETE MIX			

GROUND SURFACE TO 15'

USED HSA CASING THEN DROVE SS 24"

Sample Type
D-Dry C-Cored W-Washed
UP-Unfinished Piston
TP-Test Pit A-Auger V-Vane Test
UT-Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50+ Very Dense
Cohesive Consistency
0-4 Soft 30 + Hard
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff

summary	
EARTH BORING	<u>17'</u>
ROCK CORING	_____
SAMPLES	<u>4</u>
HOLE NO.	<u>MW-4</u>

M & W Soils Engineering, Inc.

Main St.

Charlestown, NH 03603

SHEET 1 OF 1
 DATE 3/24/94
 HOLE NO. B-1
 LINE & STA.
 OFFSET

TO DUFRESNE-HENRY ENGINEERING ADDRESS NORTH SPRINGFIELD, VT
 PROJECT NAME KNOX TREE SERVICE LOCATION WINDSOR, VT
 REPORT SENT TO BRUCE COX PROJ. NO.
 SAMPLE SENT TO RETAINED BY DUFRESNE-HENRY OUR JOB NO. 5985-94

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT SURFACE	AT COMPLETION	FA	SS		DATE STARTED 3/24/94
HOURS		Size I. D. 4"	1 1/2"		DATE COMPL. 3/24/94
		Hammer Wt. 140#	BIT		BORING FORMAN M.D. & R.H.
AT	AT	Hammer Fall 30"			INSPECTOR
HOURS					SOILS ENGR.

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect.	SAMPLE		
				From 0-6	6-12	To 12-18				NO.	PEN	REC
5'		6' - 2'6"	SS	1	3		WET	1'	SAND AND GRAVEL	1	24"	24"
				4	6							
5'		5' - 7'	SS	2	2		WET	7'	FROZEN TO LOOSE GREY FINE SANDY SILT - NO ODOR	2	24"	24"
				2	2							
10'												

GROUND SURFACE TO 5'

USED 4" FA CASING THEN DROVE SS 24"

Sample Type
 D-Dry C-Cored W-Washed
 UP-Unfinished Piston
 TP-Test Pit A-Auger V-Vane Test
 UT-Undisturbed Thinwall

Proportions Used
 trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
 Cohesionless Density
 0-10 Loose
 10-30 Med. Dense
 30-50 Dense
 50+ Very Dense
 Cohesive Consistency
 0-4 Soft 30 + Hard
 4-8 M/Stiff
 8-15 Stiff
 15-30 V-Stiff

summary
 EARTH BORING 7'
 ROCK CORING
 SAMPLES 2
 HOLE NO. B-1

FORMER KNOX & SONS
PHASE I PETROLEUM CONTAMINATION INVESTIGATION
WINDSOR, VERMONT

3/24/94

Dufresne-Henry, Inc. - Bruce Cox on site at 8:15 am.

M & W Soils Engineering, Inc. - Myron Domingue, Richard Holmes on site at 8:40 am.

Got Town Water and Sewer Department to mark out lines in front of building.
Checked HNU calibration at 9:05 am, OK.

MW-1

Started boring at 9:00 am. The rig and other equipment had been steam cleaned prior to arrival on site. All water used for cleaning split spoons and other tools was brought to the site by the boring contractor. Drilled with 4 1/4" hollow stem augers taking continuous split spoon samples starting at 1'. All samples were screened for VOC's with an HNU HW-101 (10.2 eV lamp, calibrated with isobutylene). Representative soil samples (not for chemical analysis) from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. Contamination was encountered from just below the surface to about 12'6". HNU readings ranged from 6 ppm - 150 ppm were observed in samples headspaced at ambient temperatures. A strong oily odor was observed. A pesticide-like odor was noted in the 9' - 11'6" sample. No odors or HNU readings were observed below 15'. Total depth of the boring was 17' with no refusal. The water table was encountered at about 3 feet. The general geologic column is gravel to 1', silt to 7', and silty sand to the limit of the boring. Installed a 10' long, 2" diameter, .020" machine slotted, threaded, flush joint, Schedule 40 PVC well at 14'7". All pipe came from factory sealed plastic bags. The annular space was backfilled with clean silica sand to 2'. A bentonite seal was installed from 1' - 2'. A 6" waterproof aluminum monitoring well box was grouted in flush with the surface. All excess soil was disposed of on site.

Materials: 10' of 2", .020" slot, threaded, flush joint, SCHD 40 PVC.
4'5" of 2", solid wall, threaded, flush joint, SCHD 40 PVC.
225 lb± of silica sand.
25 lb± of bentonite chips.
40 lb± of concrete mix.
1 push-on PVC cap.
1 expanding gasket cap.
1 6" monitoring well box.

MW-2

Started boring at 11:20 am±. Clean augers (not previously used on the job) were used. The bit and split spoons were cleaned with ALCONOX prior to reuse. All water used for cleaning split spoons and other tools was brought to the site by the boring contractor. Drilled with 4 1/4" hollow stem augers taking split spoon samples at five foot intervals. All samples were screened for VOC's with an HNU HW-101 (10.2 eV lamp, calibrated with isobutylene). Representative soil samples

(not for chemical analysis) from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. Contaminated soil with an oily odor was encountered in the upper three feet of soil. HNU readings of 4 ppm or less were observed in samples below 5'. Total depth of the boring was 15' with no refusal. The water table was encountered at approximately 3'. The general geologic column is gravel to 1', underlain by silty sand and sandy silt to the limit of the boring. Installed a 10' long, 2" diameter, .020" machine slotted, threaded, flush joint, Schedule 40 PVC well at 15'. All pipe came from factory sealed plastic bags. The annular space was backfilled with clean silica sand to 5'. A bentonite seal was installed from 4'2" - 5'. A 6" monitoring well box was grouted in flush with the surface. All excess soil was disposed of on site.

Materials: 10' of 2", .020" slot, threaded, flush joint, SCHD 40 PVC.
4'10 of 2", solid wall, threaded, flush joint, SCHD 40 PVC.
225 lb± of silica sand.
25 lb± of bentonite chips.
40 lb± of concrete mix.
1 push-on PVC cap.
1 expanding gasket cap.
1 6" monitoring well box.

TB-1

Started boring at 1:30 pm±. The boring was a short probe to help verify the lateral extent of the shallow oil layer noted in the previous borings. No evidence of contamination (visual or olfactory) was observed in the samples or on the tools. No HNU readings were observed. No well was installed and the hole was refilled.

MW-3

Started boring at 2:10 pm. Clean augers (not previously used on the job) were used. The bit and split spoons were cleaned with ALCONOX prior to reuse. All water used for cleaning split spoons and other tools was obtained from the Marketplace. Drilled with 4 1/4" hollow stem augers taking split spoon samples starting at 6". All samples were screened for VOC's with an HNU HW-101 (10.2 eV lamp, calibrated with isobutylene). Representative soil samples (not for chemical analysis) from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. A moderately strong to strong moth ball like odor was observed from just under the pavement to 12'. HNU readings up to 8.5 ppm were noted. The instrument reacted very slowly. Total depth of the boring was 16'6" with no refusal. The water table was encountered at approximately 4'. The general geologic column is silty, sandy, gravel fill to approximately 3', and silty sand to the limit of the boring. Installed a 10' long, 2" diameter, .020" machine slotted, threaded, flush joint, Schedule 40 PVC well at 14'6". All pipe came from factory sealed plastic bags. The annular space was backfilled with clean silica sand to 3'. A bentonite seal was installed from 2' - 3'. A 6" monitoring well box was grouted in flush with the surface. All excess soil was disposed of on site.

Materials: 10' of 2", .020" slot, threaded, flush joint, SCHD 40 PVC.
4'2" of 2", solid wall, threaded, flush joint, SCHD 40 PVC.
225 lb± of silica sand.
25 lb± of bentonite chips.
40 lb± of concrete mix.
1 push-on PVC cap.
1 expanding gasket cap.
1 6" monitoring well box.

Visitors: Mr. Knox, 2:00 - 2:10 pm.
Weather: overcast, 40's, calm.
Off site: 4:15 pm.

3/25/94

Dufresne-Henry, Inc. - Bruce Cox on site at 8:14 am.
M & W Soils Engineering, Inc. - Myron Domingue, Richard Holmes at 8:30 am.

MW-4

Started boring at 8:40 am. Clean augers (not previously used on the job) were used. The bit and split spoons were cleaned with ALCONOX prior to reuse. All water used for cleaning split spoons and other tools was obtained from the Marketplace. Drilled with 4 1/4" hollow stem augers taking continuous split spoon samples starting at 1'. All samples were screened for VOC's with an HNU HW-101 (10.2 eV lamp, calibrated with isobutylene). Representative soil samples (not for chemical analysis) from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. A moderately strong moth ball like odor was observed from just under the pavement to approximately 3'. HNU readings up to 1.8 ppm were observed. The instrument was very slow to react. Total depth of the boring was 17' with no refusal. The water table was encountered at approximately 4'. The general geologic column is sand and gravel to 1', and silty sand to the limit of the boring. Installed a 10' long, 2" diameter, .020" machine slotted, threaded, flush joint, Schedule 40 PVC well at 15'. All pipe came from factory sealed plastic bags. The annular space was backfilled with clean silica sand to 2'6". A bentonite seal was installed from 1'6" - 2'6". A 6" monitoring well box was grouted in flush with the surface. All excess soil was disposed of on site.

Materials: 10' of 2", .020" slot, threaded, flush joint, SCHD 40 PVC.
4'10" of 2", solid wall, threaded, flush joint, SCHD 40 PVC.
250 lb± of silica sand.
25 lb± of bentonite chips.
40 lb± of concrete mix.
1 push-on PVC cap.
1 expanding gasket cap.
1 6" monitoring well box.

Visitors: none.
Weather: Partly sunny, 40's, light wind.
Left site at 10:40 am. Drill crew steam cleaning equipment.

ATTACHMENT E
GROUNDWATER ANALYTICAL REPORTS



Eastern Analytical, Inc. 130 Hall St., Concord, NH 03301 (603) 228-0525

April 15, 1994

Bruce Cox
Dufresne-Henry
Precision Park
North Springfield, VT 05150

Subject: Laboratory Report

Eastern Analytical, Inc. ID #: 8235 DUF
Client Identification: 414010/Knox & Son's
Sample Quantity/Type: 4 aqueous
Date Received: 1 April, 1994

Dear Mr. Cox:

Enclosed, please find the laboratory report for the above identified project. All analyses were subjected to rigorous quality control measures to assure data accuracy.

The following standard abbreviations and conventions apply throughout all Eastern Analytical, Inc. reports:

- < = "Less than" followed by the detection limit
- TNR = Testing Not Requested
- ND = None detected, no established detection limits

If you have any questions regarding the results contained within, please feel free to directly contact me, the department supervisor, or the analytical chemist who performed the testing in question.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

William Brunkhorst ID

William Brunkhorst
Lab Director

LABORATORY REPORT

Eastern Analytical, Inc. ID#: 8235 DUF

Client: Dufresne-Henry
 Client Designation: **414010/Knox & Son's**

Sample Qty/Type: 4 aqueous
 Date Received: April 1, 1994

Hazardous Substance List Volatile Organic Compounds

Page 1 of 3

Sample ID:	MW-1	MW-3	MW-4
Matrix:	Aqueous	Aqueous	Aqueous
Date of Analysis:	4/7/94	4/7/94	4/7/94
Units:	µg/L	µg/L	µg/L
Analyst:	LB	LB	LB
Method:	EPA 8260	EPA 8260	EPA 8260
Dilution Factor:	10	1	1
Benzene	20	<1	<1
Bromobenzene	<10	<1	<1
Bromochloromethane	<20	<2	<2
Bromodichloromethane	<20	<2	<2
Bromoform	<20	<2	<2
Bromomethane	<100	<10	<10
n-Butylbenzene	<10	<1	<1
sec-Butylbenzene	<10	<1	<1
tert-Butylbenzene	<10	<1	<1
Carbon tetrachloride	<20	<2	<2
Chlorobenzene	<20	<2	<2
Chloroethane	<100	<10	<10
Chloroform	<20	<2	<2
Chloromethane	<100	<10	<10
2-Chlorotoluene	<20	<2	<2
4-Chlorotoluene	<10	<1	<1
Dibromochloromethane	<20	<2	<2
1,2-Dibromo-3-chloropropane	<20	<2	<2
1,2-Dibromoethane	<20	<2	<2
Dibromomethane	<20	<2	<2
1,2-Dichlorobenzene	<10	<1	<1
1,3-Dichlorobenzene	<10	<1	<1
1,4-Dichlorobenzene	<10	<1	<1
Dichlorodifluoromethane	<100	<10	<10
1,1-Dichloroethane	<20	<2	<2
1,2-Dichloroethane	<20	<2	<2
1,1-Dichloroethene	<20	<2	<2
cis-1,2-Dichloroethene	<20	<2	<2
trans-1,2-Dichloroethene	<20	<2	<2
1,2-Dichloropropane	<20	<2	<2
1,3-Dichloropropane	<20	<2	<2
2,2-Dichloropropane	<20	<2	<2
1,1-Dichloropropene	<20	<2	<2
Ethylbenzene	170	<1	<1
Hexachlorobutadiene	<20	<2	<2

Approved By: Timothy Schaper, Organics Supervisor Timothy D. Schaper 713

LABORATORY REPORT

Eastern Analytical, Inc. ID#: 8235 DUF

Client: Dufresne-Henry
Client Designation: 414010/Knox & Son's

Sample Qty/Type: 4 aqueous
Date Received: April 1, 1994

Hazardous Substance List Volatile Organic Compounds

Page 2 of 3

Sample ID:	MW-1	MW-3	MW-4
Matrix:	Aqueous	Aqueous	Aqueous
Date of Analysis:	4/7/94	4/7/94	4/7/94
Units:	µg/L	µg/L	µg/L
Analyst:	LB	LB	LB
Method:	EPA 8260	EPA 8260	EPA 8260
Dilution Factor:	10	1	1
Isopropylbenzene	< 10	< 1	< 1
p-Isopropyltoluene	< 10	< 1	< 1
Methylene chloride	< 20	< 2	< 2
Naphthalene	240	120	300
n-Propylbenzene	20	< 1	< 1
Styrene	< 10	1	2
1,1,1,2-Tetrachloroethane	< 20	< 2	< 2
1,1,2,2-Tetrachloroethane	< 20	< 2	< 2
Tetrachloroethene	< 20	< 2	< 2
Toluene	580	< 1	< 1
1,2,3-Trichlorobenzene	< 10	< 1	< 1
1,2,4-Trichlorobenzene	< 10	< 1	< 1
1,1,1-Trichloroethane	< 20	< 2	< 2
1,1,2-Trichloroethane	< 20	< 2	< 2
Trichloroethene	< 20	< 2	< 2
Trichlorofluoromethane	< 100	< 10	< 10
1,2,3-Trichloropropane	< 20	< 2	< 2
1,2,4-Trimethylbenzene	340	2	8
1,3,5-Trimethylbenzene	180	< 1	3
Vinyl chloride	< 100	< 10	< 10
o-Xylene	540	3	3
m,p-Xylene	1,100	3	3
MTBE	< 200	< 20	< 20

Approved By: Timothy Schaper, Organics Supervisor



LABORATORY REPORT

Eastern Analytical, Inc. ID#: 8235 DUF

Client: Dufresne-Henry
Client Designation: 414010/Knox & Son's

Sample Qty/Type: 4 aqueous
Date Received: April 1, 1994

Hazardous Substance List Volatile Organic Compounds

Page 3 of 3

Sample ID:	MW-2	
Matrix:	Aqueous	
Date of Analysis:	4/5/94	
Units:	µg/L	EPA
Analyst:	NZ	Method
Benzene	<1	602
Toluene	<1	602
Ethylbenzene	<1	602
Total Xylenes	<1	602
MTBE	<20	8015

Approved By: Timothy Schaper, Organics Supervisor Timothy D. Schaper NZ



LABORATORY REPORT

Eastern Analytical, Inc. ID#: 8235 DUF

Client: Dufresne-Henry
Client Designation: 414010/Knox & Son's

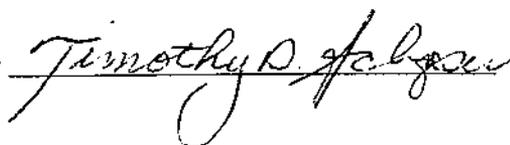
Sample Qty/Type: 1 aqueous
Date Received: April 1, 1994

Pesticides

Sample ID: MW-1
Matrix: Aqueous
Date of Extraction: 4/7/94
Date of Analysis: 4/12/94
Units: µg/L
Analyst: TDS
Method: 608(mod)

Aldrin	< 0.2
alpha-BHC	< 0.2
beta-BHC	< 0.2
gamma-BHC	< 0.2
delta-BHC	< 0.2
Chlordane	< 1
4,4'-DDT	< 0.2
4,4'-DDE	< 0.2
4,4'-DDD	< 0.2
Dieldrin	< 0.2
Endosulfan I	< 0.2
Endosulfan II	< 0.2
Endosulfan Sulfate	< 0.2
Endrin	< 0.2
Endrin Aldehyde	< 0.2
Heptachlor	< 0.2
Heptachlor Epoxide	< 0.2
Methoxychlor	< 0.2
Toxaphene	< 1

Approved By: Timothy Schaper, Organics Supervisor



4/20/94

Bruce Cox
Dufresne-Henry
Precision Park
N. Springfield, VT 05150

Subject: Laboratory Report

Eastern Analytical, Inc. ID #: 8235 A DUF
Client Identification: 414010/Knox & Son's
Sample Quantity/Type: 1 aqueous
Date Received: April 1, 1994

Dear Mr. Cox :

Enclosed please find the laboratory report for the above identified project. All analyses were subjected to rigorous quality control measures to assure data accuracy.

The following standard abbreviations and conventions apply throughout all Eastern Analytical, Inc. reports:

- * < = "less than" followed by the detection limit
- * TNR = Testing Not Requested
- * ND = None Detected, no established detection limit

If you have any questions regarding the results contained within, please feel free to directly contact me, the department supervisor, or the analytical chemist who performed the testing in question.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,



William Brunkhorst
Lab Director



environmental
laboratory inc.

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111

Ms. Teresa Dubois
Eastern Analytical, Inc.
130 Hall Street
Concord, NH 03301

April 11, 1994

SAMPLE DATA

Lab #: 32664-1
Matrix: Water
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 3/29/94
Lab Receipt Date: 4/1/94
Extraction Date: 4/5/94
Analysis Date: 4/7/94

CLIENT SAMPLE ID

Client Project: Knox & Son's

Project Number:

Station ID: MW-1

ANALYTICAL RESULTS CHLORINATED HERBICIDES

COMPOUND	Detection Limit: µg/L	Result: µg/L
Dichloroprop	8	ND
Dalapon	15	ND
2,4-D	8	ND
2,4,5-TP	4	ND
2,4,5-T	4	ND
Dicamba	4	ND
MCPA	600	ND
MCPP	600	ND
2,4-DB	8	ND
Surrogate Standard Recovery		
2,4-Dichlorophenylacetic acid		75%
ND=None Detected <=Less than >=Greater than PR=Present but not calibrated for		

METHODOLOGY: Aqueous sample analysis was conducted according to "40 CFR Part 136, EPA Method 615," and other matrices were analyzed according to "Test Methods for Evaluating Solid Waste, SW-846 Method 8150A."

COMMENTS:

Authorized signature

Kenneth W. Teague, President

EAT# 8235

CHAIN OF CUSTODY FORM

DH Dufresne-Henry, Inc.
Precision Park
No. Springfield, VT 05150 (802) 886-2261

Generator:
Facility * Knox + Sons
Generator Rep:

Page 1 of 2
DH W/O #: 414010

Return To: Bruce Cox

Client Name:

Client Job #:

Address:
(If different)

Sampled By: Oscar Garcia

ID #	Date	Time	C-Comp Or D-Desc	W-Water L-Liquid S-Solid	Number/Size Containers	Field Preserved Yes or No	Field Filtered Yes or No	Analysis Requested/Remarks	Est. Lab Cost
nw 1	3/29/94	9:25	D	W	2-40ml	HCl	No	8260A + MTBE	
nw 2	"	9:45	"	"	"	"	"	RTX + MTBE	
nw 3	"	10:25	"	"	"	"	"	8260A + MTBE	
nw 4	"	10:50	"	"	"	"	"	8260A + MTBE	
nw 1	"	9:25	"	"	Amber liter	No	No	Pesticide	
nw 1	"	9:25	"	"	"	"	"	Herbicide 8235A	8237

Generator Rep. Authorization: Estimated Lab Analysis Total \$

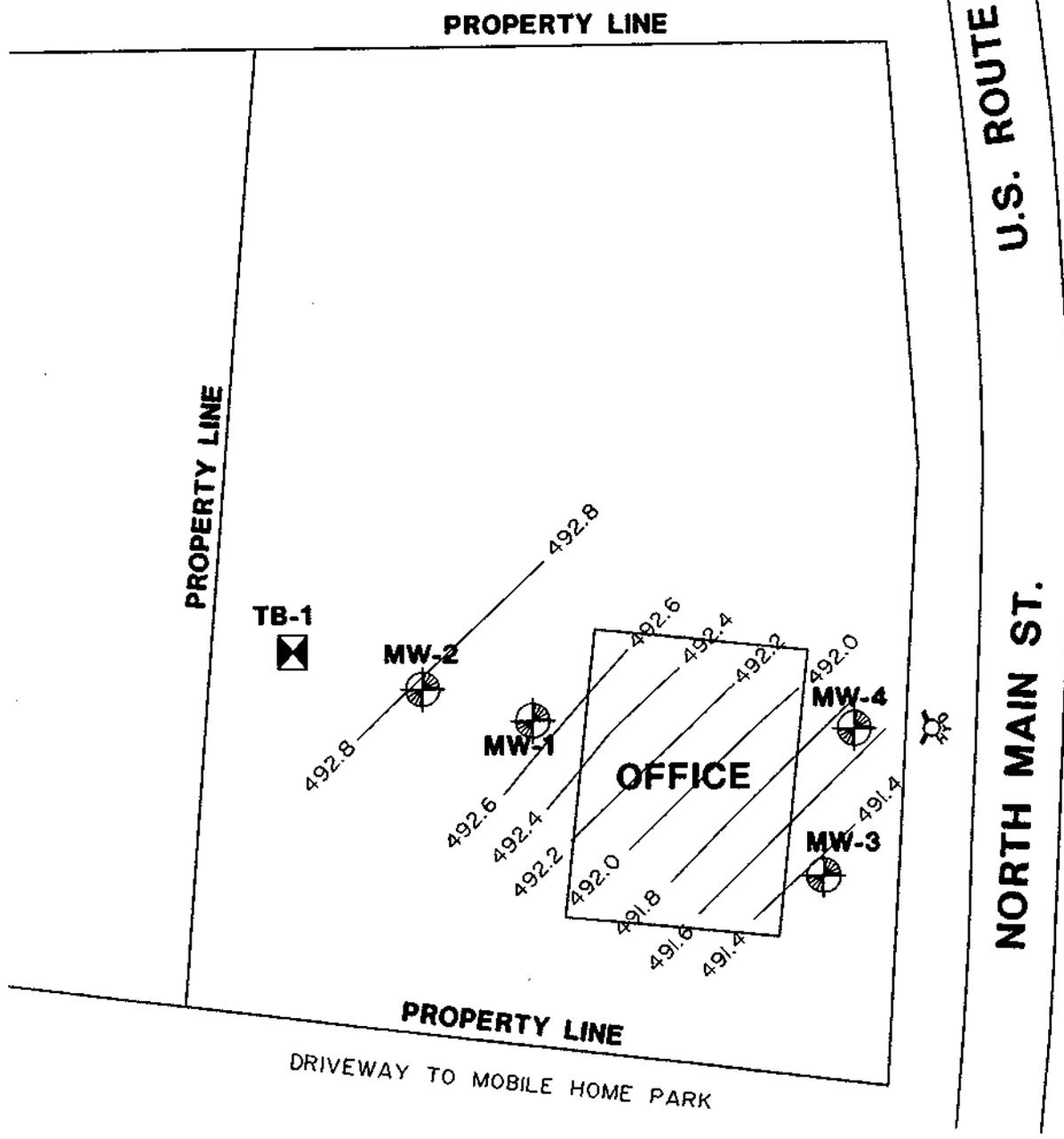
Relinquished By Generator: Oscar Garcia Jr Date: 3/30/94 Time: 8:00 AM Received By: Donna Starks Date: 4-1-94 Time: 10:25

Relinquished By: Date: Received By: Date: Time: Time:

Relinquished By: Date: Received By: Date: Time: Time:

PLEASE RETURN COMPLETED CHAIN OF CUSTODY FORM WITH ANALYSIS RESULTS

ATTACHMENT F
GROUNDWATER CONTOUR MAP



SCALE: 1" = 50'

DH
Duke & Henry, Inc.
Precision Park
No. Springfield,
Vermont 05150
Tel. (802)896-2261 Fax (802)896-2260

PHASE 1 PETROLEUM CONTAMINATION INVESTIGATION
FORMER KNOX AND SONS
GROUNDWATER CONTOURS AS OF 3/29/94
WINDSOR, VERMONT

Project No.	414010
Proj. Mgr.	B.H.C.
Date	5/94
A	1

ATTACHMENT G
COST ESTIMATE
FOR
ASPHALT BATCHING OF SOIL

DUFRESNE-HENRY, INC.

PREPARED BY B. Cox DATE 4/29/94 PROJECT NO. 414010
CALCULATIONS CHECKED BY _____ DATE _____ SHEET NO. _____ OF _____
ASSUMPTIONS / METHODS CHECKED BY _____ DATE _____
SUBJECT FORMER KNOX & SONS PHASE I PCI

ESTIMATED AREA OF CONTAMINATION (BASED ON MW'S, TB, AND TEST PITS DURING TANK CLOSURE ASSESSMENT) $\approx 35' \times 35'$

ESTIMATED DEPTH: MW-1 10' (PROBABLE WORST CASE)

$$\therefore \text{VOLUME} = 12,250 \text{ FT}^3$$

$$@ 130 \text{ lb/FT}^3 \Rightarrow 800 \text{ TONS}$$

$$\text{TRANSPORTATION, DISPOSAL} \approx \$60/\text{TON} \\ \Rightarrow \$48,000$$

$$\text{CLEAN BACKFILL} @ \$8.00/\text{YD}^2 = \$3,630$$

$$\text{LABORATORY ANALYSIS OF SOIL} \approx \$1,500$$

$$\text{TOTAL} = \$53,130$$

$$\text{CALL IT } \$55,000$$