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

23 July 1997
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DC No. A-1212

Mr. Charles Schwer
Vermont Agency of Natural Resources
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street
Waterbury, Vermont 05671-0404

Subject: Final Site Inspection Prioritization Report
Northern Wood
Burke, Vermont
CERCLIS No. VTD095525093
TDD No. 96-02-0013

Dear Mr. Schwer:

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

Please contact the undersigned at (617) 229-6430 if you have any questions regarding this report.

Very truly yours,

ROY F. WESTON, INC.
Region I START

David Gorden
Site Leader

Joseph Schmidl
Project Leader

DSG:dsg
Enclosures
cc: D. Gagne (EPA Task Monitor)

S:\96020013\NORTHERN.FIN

23 July 1997

**FINAL SITE INSPECTION PRIORITIZATION REPORT
FOR
NORTHERN WOOD
BURKE, VERMONT**

CERCLIS No. VTD095525093
TDD No. 96-02-0013

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23 July 1997

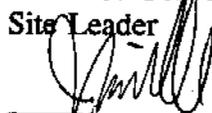
Region I START
Reviewed and Approved:



David S. Gordon
Site Leader

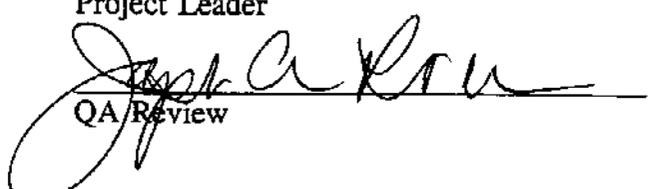
23 July 1997

Date


Joseph Schmidl
Project Leader

23 July 1997

Date


QA Review

23 July 1997

Date

Work Order No. 11098-021-001-1390-70

DISCLAIMER

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

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INTRODUCTION

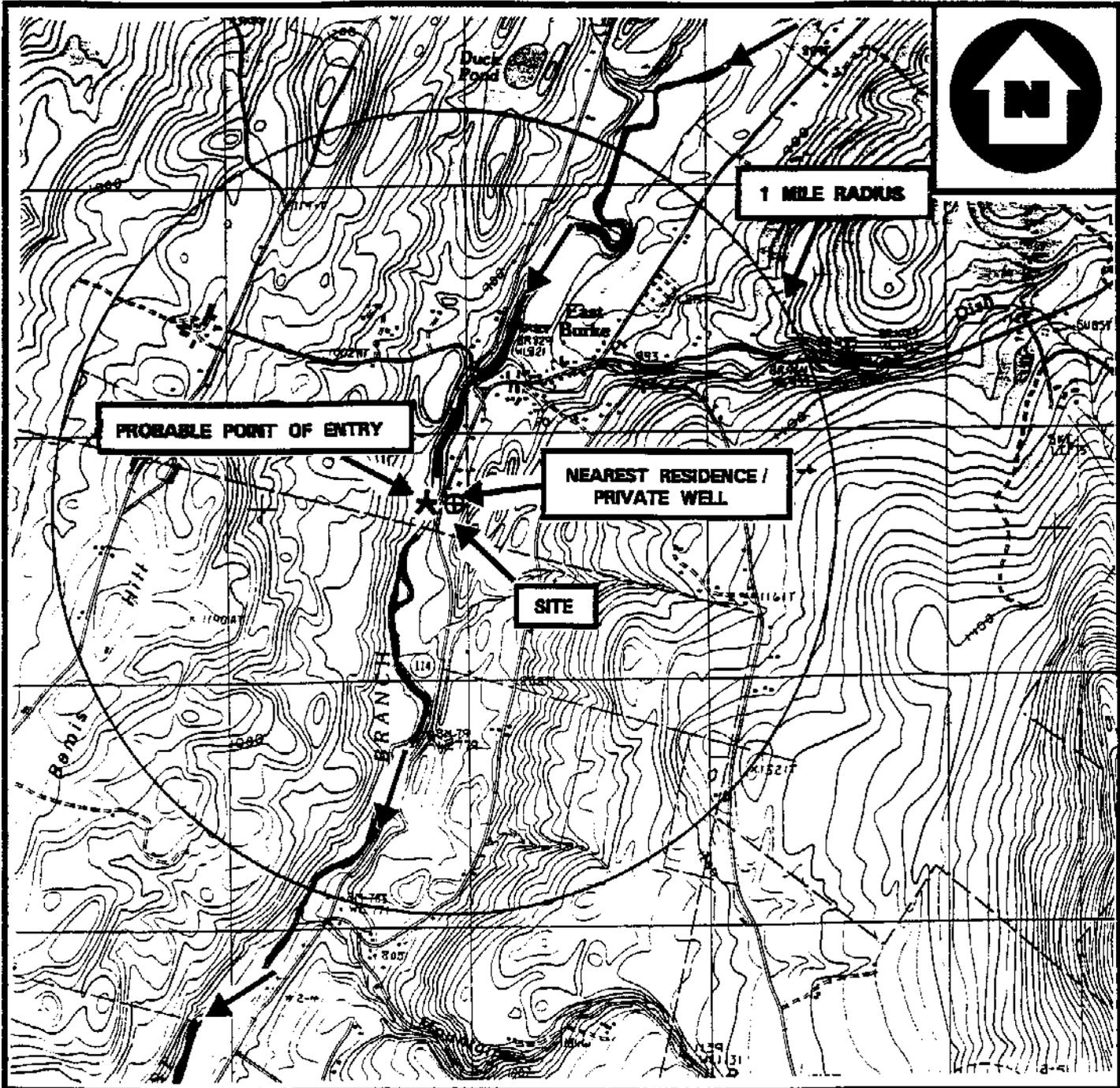
The Roy F. Weston, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START) was requested by the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration to perform a Site Inspection Prioritization (SIP) of the Northern Wood property at Route 114 in Burke, Vermont. Tasks were conducted in accordance with the SIP scope of work and technical specifications provided by EPA Region I. A Final Screening Site Inspection (SSI) Letter Report for the Northern Wood property was prepared by the NUS Field Investigation Team (NUS/FIT) on 7 August 1989. NUS/FIT shallow soil sample analytical results indicated the presence of polynuclear aromatic hydrocarbons and inorganic elements on the property. The presence of these compounds and elements are most likely due to the disposal of waste oils, and copper and zinc naphthenate during on-site activities [6, pp. 1-8]. On the basis of the information provided in the SI report, the Northern Wood SIP was initiated.

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

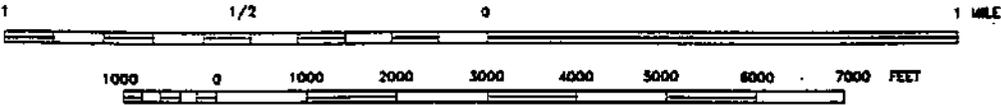
This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as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

SITE DESCRIPTION

The Northern Wood property occupies 4.9 acres near Burke, Caledonia County, Vermont, adjacent to the Burke-Lyndon town line and identified by the Burke, Vermont Tax Assessor as Map No. 11, Sheet No. 196228, Lot No. 4. The property is located at 44° 34' 59.0" north latitude, 71° 56' 52.4" west longitude (Figure 1). The Northern Wood property is located in an area zoned for commercial and mixed residential use in the Passumpsic River Valley [1; 2; 28; 37]. The property lies approximately 0.5 miles south of the center of Burke and 4 miles north of the center of the Town of Lyndonville [1; 2]. The property was the location of Northern Wood, a lumber mill and wood treatment facility. Several wood-framed structures, including a large mill building, four small garages/sheds, and a drum storage enclosure, were located on the property while the facility was in operation from 1978 to 1986 (Figure 2) [1].



BASE MAP IS A PORTION OF THE FOLLOWING 7.5' X 7.5' U.S.G.S. QUADRANGLE:
 BURKE, VERMONT, 1951



QUADRANGLE LOCATION

LOCATION MAP

NORTHERN WOOD
 RURAL ROUTE 114
 EAST BURKE, VERMONT

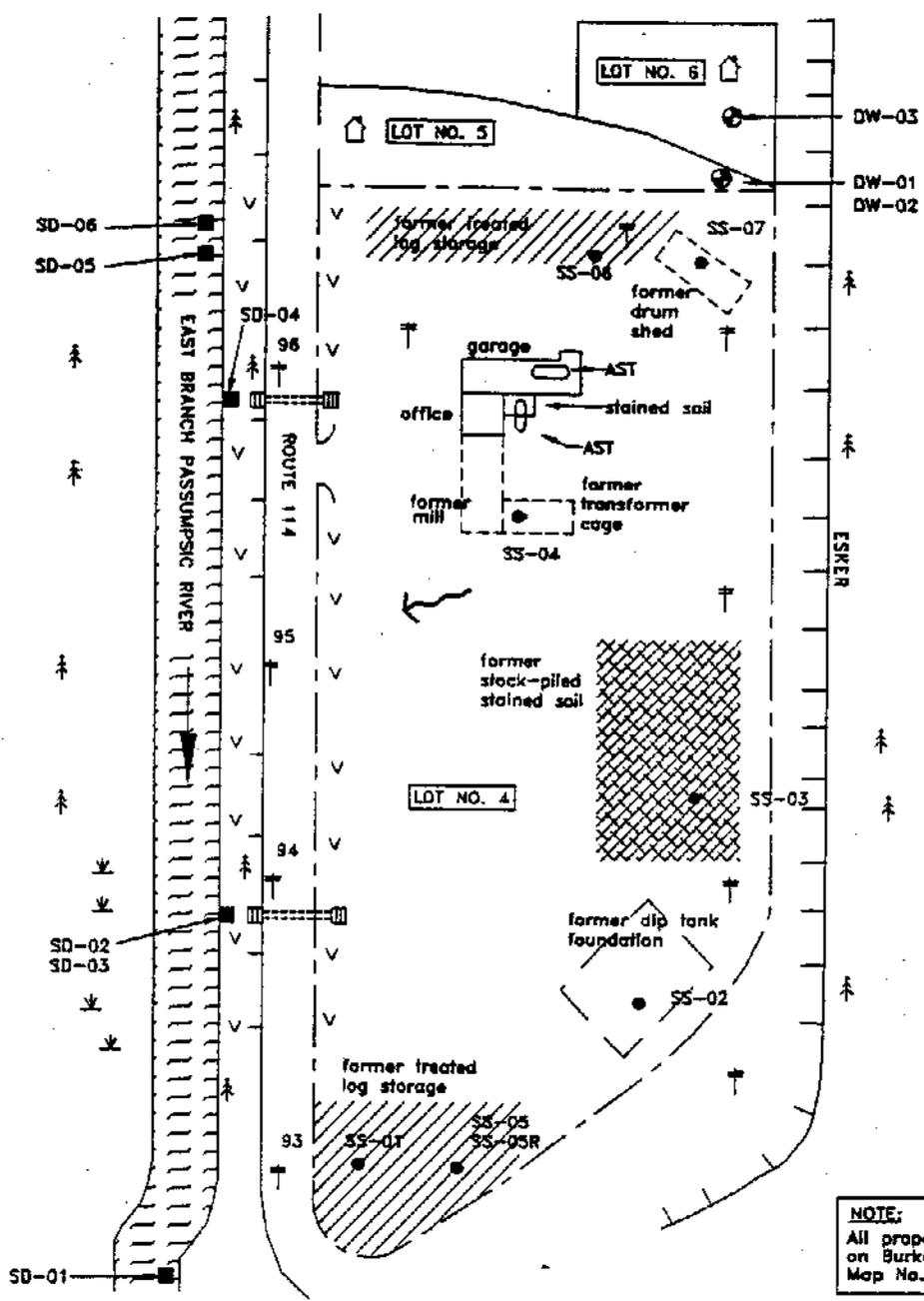


REGION 1 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 96-02-0013	DRAWN BY: TAC	DATE 6/13/96
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FILE NAME:
FIG1.DWG

FIGURE 1



NOTE:
 All properties are located
 on Burke Vt. Tax Assessor's
 Map No. 11, Sheet No. 196228

LEGEND

- AST
- WETLAND
- GRASS
- TREES/WOODED
- SOIL SAMPLE (NUS/FT)
- DRINKING WATER WELL (BEDROCK)
- PROPERTY BOUNDARY
- CATCHBASIN
- TELEPHONE POLE
- RESIDENCE
- SLOPE
- SEDIMENT SAMPLE (START)
- ESTIMATED GROUNDWATER FLOW

SITE SKETCH
 NORTHERN WOOD
 RURAL ROUTE 114
 EAST BURKE, VERMONT



REGION 1 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 96-02-0013	DRAWN BY: T. CAMPBELL	DATE 22 April 1997
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FILE NAME: S:\96020013\FIG2.DWG	FIGURE 2
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On 14 May 1996, START performed a reconnaissance of the former Northern Wood facility. START observed that the property was generally flat, (yet) gently sloped towards the north and west. A former Northern Wood garage was the only building remaining on the property (Figure 2). The garage building was being used as an office and storage area for East Burke Log Trade. The current owners, Mr. Michael Michaud and Mr. Sean Foley, rent the property to Mr. Mike Lemieux of St. Johnsbury, Vermont who in turn rents the northern portion of the property to E.D. Bessey & Son. E.D. Bessey & Son store, grade, and cut untreated wood for sale and distribute to dealers. START observed three 22-wheeled log-hauling vehicles, three log grapplers, one bulldozer, one 4-foot diameter circular saw vehicle, and one company pickup truck on the property [24, pp. 2-11].

START observed that the soil on the property is composed of compacted sand and gravel. The property was void of vegetation except for a 15-foot wide grass area that paralleled Route 114 from the property entrance to the southern property boundary. START observed that the property was bordered to the north by an "A-shaped" fence and the Lot No. 5 residence, to the northeast by trees and the Lot No. 6 residence, to the east by a steep glacial ridge, to the west by Route 114 and the East Branch of the Passumpsic River (EBPR), and to the south by the same ridge and the Burke/Lyndon town line [24, pp. 2-11].

Three workers and one dog occupy the property during the day. START observed that the closest drinking water well, a 325-foot-deep bedrock well, is located on Lot No. 5, approximately 3 feet northeast of the former Northern Wood property boundary. In addition, two stormwater sewer grates, located approximately 2 feet east of the eastern edge of Route 114, appeared to be newly constructed. It appeared that these grates would collect more stormwater from Route 114 than from the Northern Wood property. The stormwater sewers were dry during the time of the START visit. Runoff from the property drains to the river via these stormwater sewers. START observed significant gulying in the soil near the outfall pipes to each one of these stormwater sewers on the west side of Route 114. Along slightly elevated areas at the outfall of the stormwater pipes, START observed silted vegetation (current year leaves) and debris in the vegetation. This suggests that water from the EBPR flows past the outfall of these stormwater pipes. START assumes that the elevated river level occurred sometime between leaf drop (September/October) and the 13 November 1996 START sampling trip [24, pp. 2-11]. This suggests that the overland flow route soil sample locations were inundated by the river within 2 months of the START sampling event.

START observed black-stained soil near a 275-gallon "Gas Boy" diesel aboveground storage tank (AST). The area of stained soil was approximately 5 square feet (ft²). A 275-gallon heating oil AST inside the East Burke Log Trade office building garage contained an estimated 23 gallons of heating oil. Lot No. 5 has green shrubs and a green lawn. No evidence of stressed vegetation or stained soil was observed on Lot No. 5. The topography in this area is also generally flat [24, pp. 2-11].

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

The property and sawmill were owned and operated by Mr. Gerald Derry from 1962 to 1973. In 1973, the property was sold to the Coppers Company; however, Mr. Derry continued to manage the sawmill operation. The Northern Wood Company was the first to both mill and

treat lumber on the property when they purchased the property in 1978 [6, pp. 1-8]. The Northern Wood Company abandoned the property during summer 1986 and the Community National Bank (CNB) of Derby, Vermont assumed ownership. In October 1986, CNB assumed responsibility for the property cleanup even though they had already sold the property to Messrs. Michaud and Foley [10; 11]. Messrs. Michaud and Foley, the current owners, are building contractors who had planned to develop the property [6, pp. 1-8].

Northern Wood was a sawmill that made landscaping timbers from logs. Northern Wood treated these timbers for cosmetic and preservative purposes [6, pp. 1-8]. From 1978 to summer 1986, Northern Wood dip- and spray-treated logs with waste oil, and copper and zinc naphthenate [6, pp. 1-8]. The more commonly used naphthenate products were supplied by Mooney Chemical, Inc. and included Copper Hydro-Nap (58% copper naphthenate in water), Zinc Hydro-Nap (63% zinc naphthenate in water), and M-Gard W510 (58% copper naphthenate in water) [6, pp. 1-8]. Several waste oils, including No. 2, No. 4, No. 6, and Bunker C, obtained from Pollution Control Unlimited of South Portland, Maine, were used in this process [6, pp. 1-8].

From 1978 to 1985, log treatment was performed by immersing log bundles into one of three partially underground 2,500-gallon dipping tanks. These tanks, buried directly in the ground, were not in an enclosed building [6, pp. 1-8]. Between the above-mentioned dates, a fire occurred in one of the dipping tanks. After the fire, spraying the logs in the mill yard in addition to log-dipping became part of Northern Wood operational procedure [6, pp. 1-8]. Northern Wood notified EPA under RCRA on 5 May 1983 and is listed as a small quantity generator in the RCRA file (EPA No. VTD095525093) [6, pp. 1-8].

Between 1984 and 1986, Northern Wood was inspected several times by the Vermont Department of Agriculture (VT DOA) and the Vermont Agency of Environmental Conservation (VT AEC) RCRA program. As a result of the investigations, Northern Wood was cited for illegal disposal of dipping solutions caused by improper containment of dipping, spraying, and log storing operations.

Virgin naphthenate dipping solution was stored in 55-gallon drums on the dirt floor of the drum shed. Waste oil was added directly from delivery trucks to the stationary dipping tanks. Excess oil was stored in a portable 1,000-gallon auxiliary tank. In 1984, Northern Wood reportedly used 5,000 gallons of waste oil every 3 months. Solutions were not removed from the dipping tanks, other than through absorption onto timbers; therefore, an estimate cannot be made as to the amount of waste produced [6, pp. 1-8]. No other information was available to START that pertained to the quantity of waste oil or dipping solutions used.

VT AEC initiated inspections of the Northern Wood property on 29 May 1984 after receiving complaints of oil being spilled on the ground. As a result of these inspections, Northern Wood upgraded its log treatment procedures. By 1985, as an upgrade, the logs were immersed in a tank which contained either waste oil or the naphthenate-based solution. The tanks were located in a dipping shed which consisted of a wooden structure that covered the dipping tanks and the cement tank containment vault. After immersion, the logs were allowed to drain momentarily over the tanks and were then brought to either of two treated lumber storage areas. No provisions were made to prevent the excess dipping solutions from dripping on the ground as the logs were set on the unpaved ground on the northern or southern property edges [6, pp. 1-8].

In 1986, the VT AEC reported that a transformer cage was located behind the larger mill building [6, pp. 1-8]. One of the smaller garages used in the wood treatment operation housed two metal dipping tanks contained in a cement vault. None of the property was ever reported to be paved [4; 6, pp. 1-8].

VT DOA inspected the Northern Wood property in late summer 1986, after Northern Wood stopped operating, and reported a large pile of stained soil behind the dipping shed. After assuming possession of the property in fall 1986, CNB contracted New England Marine Contractors (NEMC) to excavate visibly-stained soil from the property. NEMC removed 52 tons of soil, 85 tons of solid debris, and 3,000 gallons of liquid. NEMC based their removal solely on visual inspection as pre- or post-removal sampling and analytical testing were not performed. NEMC excavated visibly-stained material from around the cement containment vault, the drum cage, and the transformers. Any other material that might have been removed from the property is unknown. Additionally, CNB contracted Transformer Services Inc. to test and remove transformers that were left on the property. The tests conducted did not detect polychlorinated biphenyls (PCBs) above the detection limit of 2 parts per million (ppm) [21]. In 1987, the current owners, Messrs. Michaud and Foley, had the buildings remaining on the property demolished and then had the property covered by 1.5 to 3 feet (5,000 cubic yards) of fine-to-medium sand fill [7; 22; 23].

In August 1989, NUS/FIT completed a final SSI letter report for the property. As part of the SSI, on 27 September 1988, NUS/FIT collected seven grab shallow soil samples (SS-01 through SS-07) and one composite shallow soil sample (SS-08) from the Northern Wood property and a trip blank sample of baked potting soil (SS-09). Collection depths ranged from 6 inches to 42 inches. Samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and pesticides/PCBs (TCL organics), and target analyte list (TAL) inorganic elements and cyanide.

Bis(2-ethylhexyl)phthalate and dieldrin were detected at two to eight times the background sample quantitation limit (SQL) concentration in soil from on-site sample locations. These compounds were not reported to be used during on-site activities. Since bis(2-ethylhexyl)phthalate is a common contaminant, it will be attributable to the property [3]. In general, unless dieldrin was improperly used or disposed of on the property, it is not considered when assessing the property. Chrysene and pyrene were detected at one to three times the background SQL in soil from on-site sample locations. The presence of these compounds indicates that waste oil may be present on the property. Inorganic analysis of soil samples detected copper and chromium at three to six times the reference background concentration. The presence of these elements is most likely due to the disposal of waste oils and copper and zinc naphthenate during on-site activities [6, pp. 1-8].

On 14 May 1996, START personnel conducted an on-site reconnaissance at Northern Wood. On 13 November 1996, START personnel performed drinking water and river sediment sampling activities adjacent to the Northern Wood property. All sampling activities were conducted in accordance with the approved Task Work Plan, dated 21 August 1996, with the exception of the location of SD-01. This sample location was moved downstream due to the location of the nearest wetland.

Results of the START drinking water sampling event indicated barium at five times and manganese at eight times reference concentrations. Results of the START sediment sampling event indicated fluoranthene at approximately eight times, pyrene at approximately 11 times, 4,4'-DDT at approximately nine times, and copper at approximately three times reference concentrations, and beryllium at two times the reference sample's detection limit (SDL).

Table 1 presents identified structures or areas on the Northern Wood property that are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source. The dipping tanks were removed prior to the SSI and are no longer a potential source of contamination.

Table 1
Source Evaluation for Northern Wood

Source Area	Containment Factors	Spatial Location
Contaminated Soil	None	The entire 4.9-acre property.
Diesel Fuel Tank	None	Located south of the East Burke Log Trade office building.
Heating Oil Tank	Inside an intact building with a concrete floor.	Located inside the East Burke Log Trade office building garage.

[24, pp. 2-11]

Table 2 summarizes the types of potentially hazardous substances which have been disposed, used, or stored on the Northern Wood property.

Table 2
Hazardous Waste Quantity for Northern Wood

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Soil (contaminated with PAHs), copper, and chromium.	4.9 acres	1978-1986	1978-1986	Entire property.
Diesel fuel	275 gallons	1978-1986	1978-1986	Located south of the East Burke Log Trade office building.
Heating oil	275 gallons	1978-1986	1978-1986	Located inside the East Burke Log Trade office building garage.

PAHs = Polynuclear Aromatic Hydrocarbons

[6, pp. 1-8]

WASTE/SOURCE SAMPLING

On 27 September 1988, NUS/FIT collected seven grab shallow soil samples (SS-01 through SS-07) and one composite shallow soil sample (SS-08) from the Northern Wood property and a trip blank sample of baked potting soil. Collection depths ranged from 6 inches to 42 inches. Samples were analyzed for TCL organics and TAL inorganic elements and cyanide. Table 3 summarizes NUS/FIT's samples collected on 27 September 1988.

Table 3

**Sample Summary: Northern Wood
Samples Collected on 27 September 1988 by NUS/FIT**

Sample Location	Sample Depth (inches)	Sample Source
SS-01	6	Soil sample, south end of property. Off fill, 100 feet from Route 114.
SS-02	18	Soil sample, above concrete floor of dip tank enclosure.
SS-03	30	Soil sample, 30 feet north of dip tank enclosure.
SS-04	42	Soil sample, 200 feet south of garage and 100 feet east of road.
SS-05	6	Soil sample, south end of property. Off fill, 150 feet from Route 114.
SS-05R	6	Replicate SS-05 (VOC); Duplicate SS-05 (SVOC).
SS-06	36	Soil sample, 100 feet south of northern property line, 100 feet west of tree line.
SS-07	18	Soil sample, 150 feet south of northern property line, 25 feet west of tree line.
SS-08	0 - 24	Soil sample, east of property and upslope, background.
SS-09	--	Baked potting soil trip blank.

[6, pp. 1-8]

Table 4 is a summary of organic compounds and inorganic elements detected through Contract Laboratory Procedure (CLP) analyses of NUS/FIT source samples. For each sample location, a compound or element is listed if it is detected at three times or greater than the reference sample concentration (SS-08). However, if the compound or element is not detected in the reference sample, the reference SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference SQL or SDL and are designated by their approximate relative concentration above these values.

Sample results quantified with a "J" on analytical tables are considered approximate because of limitations identified during CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

Table 4

Summary of Analytical Results
 Source Sample Analysis for Northern Wood
 Samples Collected on 27 September 1988 by NUS/FIT

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SS-01 (s)	SVOCs			
	Chrysene	830 J ppb	450 ppb	1.84 × SQL
	PESTICIDES/PCBs			
	Dieldrin	49 J ppb	22 ppb	2.23 × SQL
SS-02 (s)	INORGANICS			
	Copper	27.8 ppm	5.7 ppm	4.88 × Ref
	Sodium	166 J ppm	34.5 J ppm	4.81 × Ref
SS-03 (d)	INORGANICS			
	Copper	22.3 ppm	5.7 ppm	3.91 × Ref
	Sodium	202 J ppm	34.5 J ppm	5.86 × Ref
SS-04 (d)	INORGANICS			
	Sodium	110 J ppm	34.5 J ppm	3.19 × Ref
SS-05 (s)	SVOCs			
	Pyrene	460 J ppb	450 ppb	1.02 × SQL
	Bis(2-ethylhexyl)phthalate	3,500 J ppb	450 ppb	7.78 × SQL
	Chrysene	1,100 J ppb	450 ppb	2.44 × SQL
	PESTICIDES/PCBs			
	Dieldrin	79 J ppb	22 ppb	3.59 × SQL
	INORGANICS			
	Sodium	148 J ppm	34.5 J ppm	4.29 × Ref

Table 4

**Summary of Analytical Results
Source Sample Analysis for Northern Wood
Samples Collected on 27 September 1988 by NUS/FIT
(Concluded)**

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments
SS-06 (d)	SVOCs			
	Bis(2-ethylhexyl)phthalate	1,700 J ppb	450 ppb	3.78 × SQL
	INORGANICS			
	Chromium	38.9 ppm	10 ppm	3.89 × Ref
	Magnesium	7,440 ppm	1,510 ppm	4.93 × Ref
SS-07 (s)	SVOCs			
	Bis(2-ethylhexyl)phthalate	1,100 J ppb	450 ppb	2.44 × SQL
	INORGANICS			
	Sodium	106 J ppm	34.5 J ppm	3.07 × Ref

- Ref = Reference value.
- ppb = Parts per billion.
- ppm = Parts per million.
- PCBs = Polychlorinated biphenyls.
- SQL = Sample Quantitation Limit.
- SVOCs = Semivolatile organic compounds.
- J = Quantitation is estimated due to limitations identified in the quality control review.
- (s)/(d) = Shallow/Deep.

[6, pp. 1-8]

Bis(2-ethylhexyl)phthalate and dieldrin were detected at two to eight times the background SQL concentration in soil from on-site sample locations. These compounds were not reported to be used during on-site activities. Since bis(2-ethylhexyl)phthalate is a common contaminant, it may be associated with the source on the property [3]. Since pesticides are ubiquitous in the environment, the single detection (near the SQL), may be a laboratory error, and therefore, 4,4'-DDT and dieldrin are not associated with the sources on the property [3]. In general, unless pesticides were improperly used or disposed of on the property, they are not used when assessing a property. Chrysene and pyrene were detected at one to three times the background SQL in soil from on-site sample locations. The presence of these compounds indicates that waste oil may be present on the property. Inorganic analysis of soil samples detected copper and chromium at three to six times the reference background concentration. The presence of these elements is most likely due to the disposal of waste oils and copper and zinc naphthenate during on-site activities [6, pp. 1-8].

GROUNDWATER PATHWAY

Surficial geology in the area consists of glacially-derived material. The area surrounding the property is typified by medium-to-coarse grained, highly permeable sand. The overburden underlying the property also consists of medium-to-coarse grained sand and gravel. Bedrock in the area belongs to the Waits River Formation which consists primarily of phyllite/schist, quartzite, amphibolite, and limestones. Approximately 3.5 miles southwest of the property, near the confluence of the East and West Branches of the Passumpsic River, NUS/FIT noted grey to black limestone/calcareous phyllite with approximately four to five fractures per foot [6, pp. 1-8]. Based on EPA Region I guidance, for the purpose of this report, no bedrock formation mapped within 4-radial miles of Northern Wood is considered karst. Precipitation for St. Johnsbury, Vermont, approximately 19 miles south of East Burke, averages 37.21 inches per year [35].

All or part of the following Vermont towns are located within 4-radial miles of the property: Sheffield, Burke, East Haven, and Lyndon [1; 2; 28]. Groundwater use within 4-radial miles of the property consists of the Lyndonville municipal wells, the Lyn Haven community water system, a private well and spring overseen by George Willey of the local fire district, and an unknown number of private residential wells [1; 2; 19; 22; 26; 34].

The Lyndonville municipal wells are three gravel-packed blended wells that are located approximately 3.2 miles southwest of the property and 200 feet south of the EBPR and approximately 0.25 miles south of the confluence of the East and West Branches of the Passumpsic River [1; 2; 6, pp. 1-8; 22]. The Lyndonville municipal wells serve the entire population of Lyndon, an estimated 3,700 residents [32]. No well contributes greater than 40% of the total water supply. In the 1980s, the State of Vermont reported trace levels of VOCs (trans-1,2-dichloroethylene and trichloroethylene) and lead below the safe drinking water levels in the Lyndonville municipal well field. These VOCs were not detected at Northern Wood by NUS/FIT in 1988 and have been attributed to the Darling Hill Dump, a National Priority List (NPL) site [3; 4]. An Administrative Order from VT AEC compelled Lyndonville to build an activated carbon treatment system for the well field in 1991 [6, pp. 1-8; 32].

The Lyn Haven community water system, comprising one bedrock well, is located approximately 2 miles west of the Northern Wood property near the intersection of Route 5, and the Burke-Lyndon town line. This well system is screened in bedrock, is approximately 325 feet deep, and has approximately 22 service connections that serve an estimated 114 people [19].

The well and spring overseen by George Willey are located 0.9 miles east of the Northern Wood property in Lyndon. The well is a 400-foot deep bedrock well. The well is cased to 40 feet even though bedrock was encountered at 18 feet. This well is for emergency use only [33]. The spring flows from a rock fissure and is the primary source of drinking water for an estimated 55 people in Burke, Vermont. It is located on Kirby Hill Road in Lyndon, some 500 feet in elevation higher than the Northern Wood property. It produces 22,000 gallons per day and constantly overflows its 8,100-gallon holding tank [33]. Table 5 summarizes public groundwater supply sources within 4-radial miles of the Northern Wood property.

Table 5

Public Groundwater Supply Sources Within 4-Radial Miles of Northern Wood

Distance/ Direction from Site	Source Name	Location of Source ^a	Estimated Population Served	Source Type ^b
0.9 miles east	LFD	Burke	55	Bedrock
2.0 miles west	Lyn Haven CWS	Lyn Haven	114	Bedrock
3.2 miles southwest	LMW	Lyndonville	3,700	Overburden

^a Indicates Town in which well is located.

^b Overburden, Bedrock, or Unknown.

LMW = Lyndonville Municipal Wells

CWS = Community Water System (in Lyn Haven, Vermont)

LFD = Local Fire District (overseen by George Willey)

[1; 2; 6, pp. 1-8; 19; 22; 26; 32; 33; 34]

An estimated 958 residents in Burke live within 4-radial miles of the Northern Wood property. An estimated 903 are supplied by a combination of private bedrock and overburden drinking water wells [30].

Based on START on-site reconnaissance observations, the nearest drinking water well is on the Lot No. 5 property, which has two residents. The groundwater well is 3 feet northeast, while the residence is approximately 75 feet north of the Northern Wood property. The exact locations of private wells in Burke, Vermont are difficult to determine since only records for wells drilled after 1966 are available from the Groundwater Management Section of the VT AEC and many of the wells in Burke predate 1966 [26]. Since the northeastern section of Lyndon falls within 4-radial miles of the Northern Wood property, some of the 1,600 Lyndon residents who rely on private groundwater sources also fall within 4-radial miles of the property [6, pp. 1-8].

Private groundwater supplies located within 4-radial miles of the property were estimated using equal distribution calculations of U.S. Census CONTRACTS data identifying population, households, and private water wells for "Block Groups" which lie within or partially within individual radial distance rings measured from the Northern Wood property [30]. The total population that relies on groundwater within 4-radial miles of the property is estimated as 4,827 persons and is summarized in Table 6.

Table 6

**Estimated Drinking Water Populations Served by Groundwater Sources
Within 4-Radial Miles of Northern Wood**

Radial Distance From Northern Wood (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
0.00 < 0.25	3	0	3
0.25 < 0.50	9	0	9
0.50 < 1.00	40	55	95
1.00 < 2.00	183	114	297
2.00 < 3.00	326	0	326
3.00 < 4.00	397	3,700	4,097
TOTAL	958	3,869	4,827

[30; 32; 33; 34]

START personnel collected DW-03 from the residence at Lot No. 6 as a reference drinking water sample. This sample had a conductivity of 150 μ mhos, a temperature of 12°C, and a pH of 8. START personnel collected samples DW-01 and DW-02 (duplicate and matrix spike/matrix duplicate (MS/MSD)) from the residence at Lot No. 5 to assess potential drinking water contamination targets. This sample had a conductivity of 137 μ mhos, a temperature of 10°C, and a pH of 7.5. The sample summary for START's groundwater sampling event is presented in Table 7.

Table 7

**Groundwater Sample Summary: Northern Wood
Samples Collected on 13 November 1996 by START**

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth	Sample Source
MATRIX: Aqueous					
DW-01	AMJ76 MAKD92 DAF409	0913	Grab	NA	MS/MSD. DW-01 was collected from the residence at Lot No. 5 as a potential drinking water contamination target.
DW-02	AMJ77 MAKD93 DAF410	0913	Grab	NA	Duplicate of DW-01.

Table 7

**Groundwater Sample Summary: Northern Wood
Samples Collected on 13 November 1996 by START
(Concluded)**

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth	Sample Source
MATRIX: Aqueous					
DW-03	AMJ78 MAKD94 DAF411	0854	Grab	NA	DW-03 was collected from the residence at Lot No. 6 as a reference drinking water sample.
TB-02	DAF412	0845	Grab	NA	Trip blank for quality control.

MS/MSD = Matrix Spike/Matrix Spike Duplicate
 NA = Not applicable

Table 8 is a summary of organic compounds and inorganic elements detected through CLP analyses of START groundwater samples. For each sample location, a compound or element is listed if it is detected at three times or greater than the reference sample concentration (DW-03). However, if the compound or element is not detected in the reference sample, the reference SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference SQL or SDL and are designated by their approximate relative concentration above these values.

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

Table 8

**Summary of Analytical Results
Groundwater Sample Analysis for Northern Wood**

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
DW-01	INORGANICS			
	Barium	96.1 µg/L	19.2 µg/L	5.01 × Ref
	Manganese	28.1 µg/L	3.5 µg/L	8.03 × Ref

Table 8

**Summary of Analytical Results
Groundwater Sample Analysis for Northern Wood
(Concluded)**

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
DW-02	INORGANICS			
	Barium	93.9 $\mu\text{g/L}$	19.2 $\mu\text{g/L}$	4.89 \times Ref
	Manganese	27.2 $\mu\text{g/L}$	3.5 $\mu\text{g/L}$	7.77 \times Ref

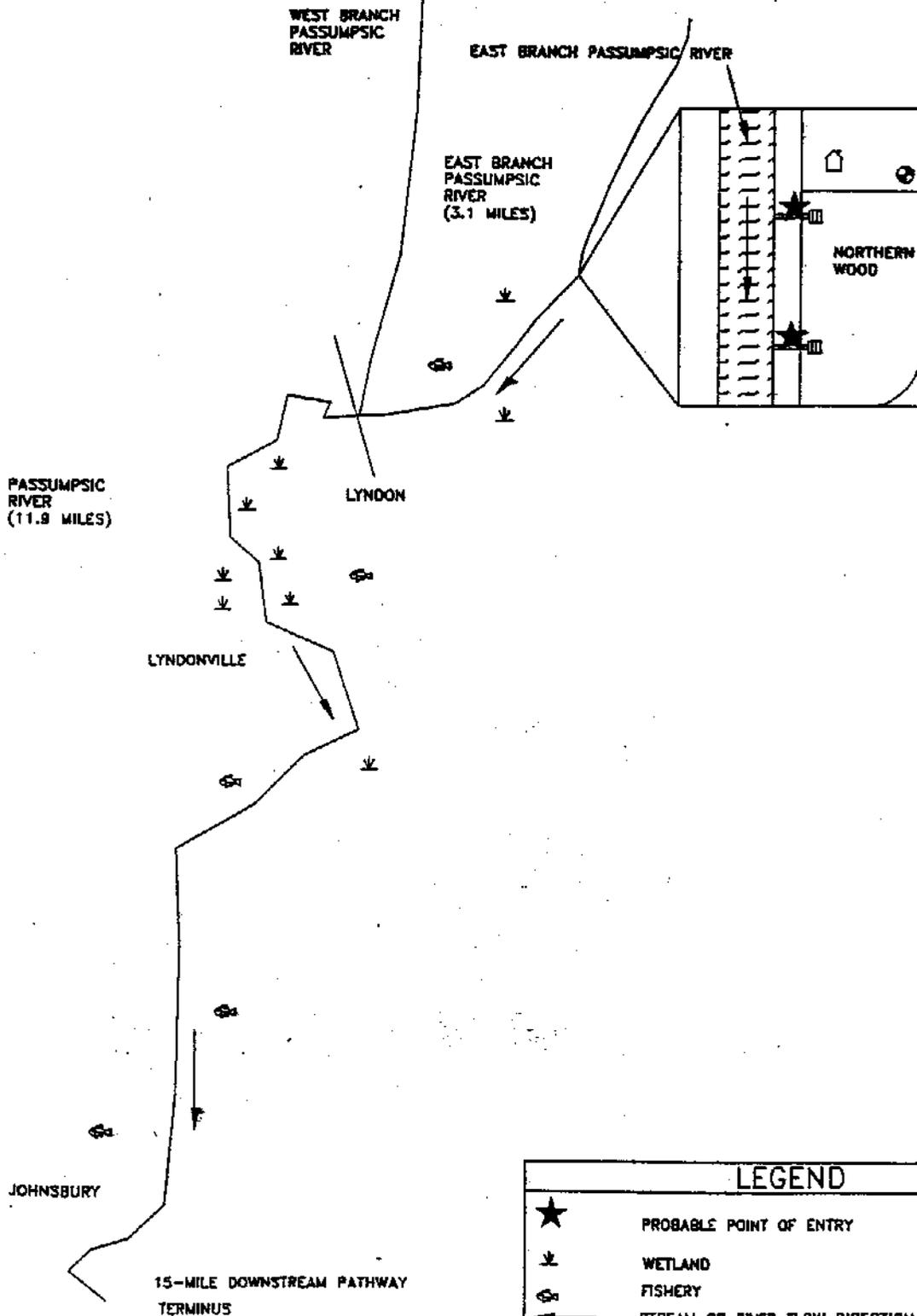
Ref = Reference value.
 $\mu\text{g/L}$ = Micrograms per liter.

[40]

Barium and manganese, detected in a drinking water well approximately 3 feet northeast of the Northern Wood property, were not detected in source samples collected by NUS/FIT in 1988. However, due to the incompleteness of information regarding the constituents of hazardous materials disposed of on the property, START has used the detection of barium and manganese to document an observed release to groundwater and actual contamination drinking water targets.

SURFACE WATER PATHWAY

The Northern Wood property is located approximately 75 feet east of the EBPR. Surface water runoff from the property and Route 114 is routed through two culverts, westward under Route 114, and into the EBPR via two channels. The probable point of entry (PPE) into surface water occurs at the outfall of each of two stormwater sewer culverts to the river. Along slightly elevated areas at the outfall of the stormwater pipes, START observed silted vegetation (current year leaves) and debris in the vegetation. This indicates that water from the EBPR flowed over the outfall of these stormwater pipes. START assumes that the elevated river level occurred sometime between leaf drop (September/October) and the 13 November 1996 START sampling trip [24, pp. 2-11]. This suggests that the overland flow route soil sample locations were inundated by the river within 2 months of the START sampling event. Approximately 3.1 miles downstream (south) of the Northern Wood property, the East and West Branches of the Passumpsic River merge to form the Passumpsic River (PR) (Figure 3) [1; 2; 28]. The drainage basin areas of the EBPR at East Haven, Vermont and the PR at St. Johnsbury, Vermont, respectively, were used to estimate the mean annual flow rates of the surface water bodies [41; 42]. Figure 3 show the surface water bodies along the 15-mile downstream pathway and Table 9 summarizes surface water bodies along the 15-mile downstream pathway from the Northern Wood property.



LEGEND

- ★ PROBABLE POINT OF ENTRY
- ⌋ WETLAND
- 🐟 FISHERY
- STREAM OR RIVER FLOW DIRECTION

SURFACE WATER PATHWAY SKETCH

NORTHERN WOOD
 RURAL ROUTE 114
 EAST BURKE, VERMONT



REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TOO # 96-02-0013	DRAWN BY: T. CAMPBELL	DATE 5/12/97
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FILE NAME:
S:\96020013\FIG3.DWG

FIGURE 3

Table 9

Surface Water Bodies Along the 15-Mile Downstream Pathway from Northern Wood

Surface Water Body	Descriptor ^a	Length of Reach (miles)	Flow Characteristics (cfs) ^b	Length of Wetlands (miles)
East Branch Passumpsic River	Sm. to Mod. Stream	3.1	97	0.38
Passumpsic River	Mod. to Lge. Stream	11.9	427	3.52

^a Small to moderate stream 10-100 cfs, moderate to large stream > 100-1,000 cfs

^b Cubic feet per second.

[41; 42]

Throughout Lyndon, the PR is used for recreational purposes including fishing, swimming, and boating [22]. In addition, St. Johnsbury Center uses the PR for recreational purposes [23]. Approximately 9.5-downstream miles from the Northern Wood property, Central Vermont Power maintains a hydroelectric power plant along the PR [23; 28]. There are no known drinking water intakes within 15-downstream miles of the property [23].

There are several sensitive environments, including wetlands, located within 15-downstream miles of the property. The State of Vermont Department of Fish and Wildlife Non-game and Natural Heritage Program has not performed a biological evaluation of the Burke, Vermont area. Table 10 shows sensitive environments along the 15-mile downstream pathway from the Northern Wood property.

Table 10

Sensitive Environments Along the 15-Mile Downstream Pathway from Northern Wood

Sensitive Environment Name	Sensitive Environment Type	Water Body	Downstream Distance from PPE (miles)	Flow Rate at Environment (cfs) ^a
Heath Bog	SNC	EBPR	1 to 2	97
Cedar Swamp	NC	EBPR	2 to 3	97
Sheathed Sedge	State-endangered	EBPR	2 to 3	97
Sweet Coltsfoot	State-threatened	EBPR	2 to 3	97

^a Cubic feet per second

SNC = Significant Natural Community

NC = Natural Community

EBPR = East Branch of the Passumpsic River

[38]

On 13 November 1996, START personnel collected six sediment samples from the EBPR and associated locations along the overland flow route to the EBPR. Table 11 summarizes the samples collected by START.

Table 11

**Sediment Sample Summary: Northern Wood
Samples Collected on 13 November 1996 by START**

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth	Sample Source
MATRIX: Soil/Sediment					
SD-01	AMJ69 MAKD85	1032	Grab	0 to 6 inches	Sediment sample collected in the East Branch of the Passumpsic River, 0.1-downstream miles from the southernmost probable point of entry. Matrix spike/matrix spike duplicate (MS/MSD). Brown coarse sand with gravel.
SD-02	AMJ70 MAKD86	1049	Grab	0 to 6 inches	Shallow soil sample collected along the overland flow route 4 feet west of the southernmost probable point of entry. Brown silt loam.
SD-03	AMJ71 MAKD87	1049	Grab	0 to 6 inches	Duplicate of SD-02. Brown silt loam.
SD-04	AMJ72 MAKD88	1110	Grab	0 to 6 inches	Shallow soil sample collected along the overland flow route 2 feet west of the northernmost probable point of entry. Brown fine-to-coarse sand with cobbles and trace organics.
SD-05	AMJ73 MAKD89	1125	Grab	0 to 6 inches	Sediment sample collected in the East Branch of the Passumpsic River upstream of the northernmost probable point of entry, to document reference conditions. Brown-to-grey sand with some gravel (wet).
SD-06	MAKD90	1129	Grab	0 to 6 inches	Sediment sample collected in the East Branch of the Passumpsic River upstream of the northernmost probable point of entry, as a second reference sample for inorganic elements. Brown-to-grey sand with some gravel (wet).
MATRIX: Aqueous					
RB-01	AMJ75 MAKD91	0920	Grab	NA	Sampling equipment rinsate blank collected for quality control.
TB-01	AMJ74	0845	Grab	NA	Trip blank collected for quality control.

MS/MSD = Matrix Spike/Matrix Spike Duplicate

[24, p. 10]

Table 12 is a summary of organic compounds and inorganic elements detected through CLP analyses of START sediment samples. For each sample location, a compound or element is listed if it is detected at three times or greater than the reference sample concentration (SD-05/SD-06). However, if the compound or element is not detected in the reference sample, the reference SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference SQL or SDL and are designated by their approximate relative concentration above these values.

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

Table 12
Summary of Analytical Results
Sediment Sample Analysis for Northern Wood
Samples Collected on 13 November 1996 by START

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SD-02	SVOCs			
	Fluoranthene	85 J $\mu\text{g}/\text{kg}$	25 J $\mu\text{g}/\text{kg}$	3.4 \times Ref
	Pyrene	140 J $\mu\text{g}/\text{kg}$	22 J $\mu\text{g}/\text{kg}$	6.36 \times Ref
	INORGANICS			
	Beryllium	0.48 J mg/kg	0.26 U mg/kg	1.85 \times SDL
	Copper	14.1 mg/kg	4.4 mg/kg	3.2 \times Ref
SD-03	SVOCs			
	Fluoranthene	190 J $\mu\text{g}/\text{kg}$	25 J $\mu\text{g}/\text{kg}$	7.6 \times Ref
	Pyrene	240 J $\mu\text{g}/\text{kg}$	22 J $\mu\text{g}/\text{kg}$	10.9 \times Ref
	PESTICIDES/PCBs			
	4,4'-DDT	0.94 J $\mu\text{g}/\text{kg}$	0.10 J $\mu\text{g}/\text{kg}$	9.4 \times Ref
	INORGANICS			
	Beryllium	0.52 J mg/kg	0.26 U mg/kg	2.00 \times SDL
Copper	14.9 J mg/kg	4.4 J mg/kg	3.38 \times Ref	

[39; 40]

Ref = Reference value.
 $\mu\text{g}/\text{kg}$ = Micrograms per kilogram.
 mg/kg = Milligrams per kilogram.
 PCBs = Polychlorinated biphenyls.
 SDL = Sample Detection Limit.
 SVOCs = Semivolatile organic compounds.

Pyrene and copper were detected in source soil samples and associated locations along the flow route to the EBPR, and are attributable to the Northern Wood property. Beryllium, found in sediment samples, is not attributable to the Northern Wood property. Source soil samples determined dieldrin, a pesticide, to be present. At one river sediment sample location, 4,4'-DDT, another pesticide was found, but this contaminant did not duplicate and may be attributable to laboratory error.

In general, unless 4,4'-DDT was improperly used or disposed of on the property, it is not used when assessing a property. Since 4,4'-DDT was only detected in one sediment sample and not on the property (source), the pesticide may come from an upgradient property along the storm drainage route [3]. Fluoranthene, a coal tar pitch volatile, could be attributable to the Northern Wood property, but it was not found in on-site source soil samples. Polynuclear aromatic hydrocarbons (PAHs) such as pyrene and fluoranthene are typical constituents in urban runoff from black top/asphalt pavement. Runoff from Route 114 also is collected by the stormwater sewer, across from the location where SD-02/SD-03 was collected, and therefore may not be solely attributable to the Northern Wood property. Along slightly elevated areas at the outfall of the stormwater pipes, START observed silted vegetation (current year leaves) and debris in the vegetation. This indicates that water from the EBPR flowed over the outfall of these stormwater pipes. START assumes that the elevated river level occurred sometime between leaf drop (September/October) and the START sampling trip [24, pp. 2-11]. This suggests that the overland flow route soil sample locations were inundated by the river within 2 months of the START sampling event.

SOIL EXPOSURE PATHWAY

The property is currently being used as the East Burke Log Trade log storage yard. During the 14 May 1996 START on-site reconnaissance, three full-time on-site workers and a dog were observed on the property. There are no residences on the property. The nearest off-site residence is approximately 75 feet north of the northern property boundary, and houses two people. There are no schools or day-care facilities located within 200 feet of an area of observed contamination on the property [24, pp. 2-11]. An estimated 313 people live within 1-radial mile of the property [30].

In 1986, NEMC, on behalf of CNB, removed visibly-contaminated soil from the property without sampling. NEMC then covered the property with approximately 2 feet of fill material, with less being distributed around the edges of the property. During the 1988 NUS/FIT property visit, a single wood-framed garage and the concrete bottom of the dipping tank containment vault were visible on the property. The flat concrete slab was covered with 2 to 3 feet of clean fill and 95% of the property had been covered with approximately 5,000 cubic yards of fine-to-medium sand fill. The exceptions were the northern, eastern, and southern extremes of the property where native soil was exposed [6, pp. 1-8]. No evidence suggested that this area would be used as a recreational area; however, the ridge on the southern extent of the property could be used for winter sledding activities, and the EBPR snowmobile trail passes less than 75 feet west of the property. For the purpose of this report, the property was considered accessible with no public recreational use [24, pp. 2-11].

On 27 September 1988, NUS/FIT collected eight samples from the soil on the Northern Wood property and a trip blank sample from baked potting soil. Samples SS-01, SS-02, SS-05/SS-

05R, and SS-07 were collected from depths less than 2 feet [6, pp. 1-8]. Bis(2-ethylhexyl)phthalate and dieldrin were detected at two to eight times above the background SQL concentration in soil from on-site sample locations. These compounds were not reported to be used during on-site activities. Since bis(2-ethylhexyl)phthalate is a common contaminant, it will be attributable to the property [3]. In general, unless dieldrin was improperly used or disposed of on the property, it is not used when assessing a property. Chrysene and pyrene were detected at one to three times above the background SQL in soil from on-site sample locations. Table 4 summarizes these analytical results. The presence of these compounds indicates that waste oil may be present on the property. Inorganic analysis of soil samples detected copper five times above the reference background concentration. The presence of this element is most likely due to the disposal of waste oils and copper and zinc naphthenate during on-site activities [6, pp. 1-8].

Due to the availability of NUS/FIT CLP analytical results, START did not collect soil samples from the Northern Wood property as part of sampling.

AIR PATHWAY

The property is currently being used as the East Burke Log Trade log storage yard with three full-time on-site workers and one dog. No residents live on the property. The nearest off-site residence is approximately 75 feet north of the northern property boundary and houses two people. There are no schools or day-care facilities located within 200 feet of an area of observed contamination on the property [24, pp. 2-11]. An estimated 3,400 people live within 4-radial miles of the property [30]. Table 13 shows the estimated population within 4-radial miles of the Northern Wood property.

Table 13

Estimated Population Within 4-Radial Miles of Northern Wood

Radial Distance From Northern Wood (miles)	Estimated Population
On-site (workers)	3
0.00 < 0.25	14
0.25 < 0.50	56
0.50 < 1.00	243
1.00 < 2.00	903
2.00 < 3.00	1,009
3.00 < 4.00	1,172
TOTAL	3,400

[30]

During the START on-site reconnaissance, air quality was monitored using a photoionization detector (PID). No readings above background levels were noted across the Northern Wood property. START did not conduct air sampling at the property as part of the SIP.

The State of Vermont Department of Fish and Wildlife Non-game and Natural Heritage Program has not performed a biological evaluation of the Burke, Vermont area. Table 14 lists rare and endangered vegetative species within 4-radial miles and 15-downstream miles of the property.

Table 14

Sensitive Environments Located Within 4-Radial Miles of Northern Wood

Radial Distance from Northern Wood (miles)	Sensitive Environment/Species (status)
0.00 < 0.25	Clean Water Act
	9 acres of wetlands
0.25 < 0.50	9 acres of wetlands
0.50 < 1.00	55 acres of wetlands
1.00 < 2.00	134 acres of wetlands
	Heath Bog, significant natural community
2.00 < 3.00	222 acres of wetlands
	Cedar Swamp, natural community
	State-endangered/State-threatened
3.00 < 4.00	215 acres of wetlands

[38]

SUMMARY

The Northern Wood property occupies 4.9 acres near Burke, Caledonia County, Vermont, adjacent to the Burke-Lyndon town line. The property lies approximately 0.5 miles south of the center of Burke and 4 miles north of the center of the Town of Lyndonville. The property was the location of Northern Wood, a lumber mill and wood treatment facility. Several wood-framed structures, including a large mill building, four small garages/sheds, and a drum storage enclosure were located on the property while the facility was in operation from 1978 to 1986.

The Northern Wood Company was the first to both mill and treat the lumber on location when they purchased the property in 1978. The Vermont Department of Agriculture (VT DOA) inspected the Northern Wood property in late summer 1986, after Northern Wood stopped operating, and reported a large pile of stained soil behind the dipping shed. After assuming possession of the property in fall 1986, Community National Bank (CNB) contracted New England Marine Contractors (NEMC) to excavate visibly-stained soil from the property. NEMC removed 52 tons of soil, 85 tons of solid debris, and 3,000 gallons of liquid. NEMC based their removal solely on visual inspection. NEMC excavated visibly-stained material from around the cement containment vault, the drum cage, and the transformers. Additionally, CNB contracted Transformer Services Inc. to test and remove transformers that were left on the property. The tests conducted did not detect polychlorinated biphenyls (PCBs) above the detection limit of 2 parts per million. In 1987, the current owners, Mr. Michael Michaud and Mr. Sean Foley, had the buildings remaining on the property demolished and then had the property covered with 1.5 to 3 feet (5,000 cubic yards) of fine-to-medium grained sand fill.

On 27 September 1988, NUS Corporation/Field Investigation Team (NUS/FIT) collected seven grab shallow soil samples and one composite shallow soil sample from the Northern Wood property. Collection depths ranged from 6 inches to 42 inches.

Bis(2-ethylhexyl)phthalate and dieldrin were detected at two to eight times above the background SQL concentration in soil from on-site sample locations. These compounds were not reported to be used during on-site activities. Since bis(2-ethylhexyl)phthalate is a common contaminant, it will be attributable to the property [3]. In general, unless dieldrin was improperly used or disposed of on the property, it is not used when assessing a property. Chrysene and pyrene were detected at one to three times above the background SQL in soil from on-site sample locations. The presence of these compounds indicates that waste oil may be present on the property. Inorganic analysis of soil samples detected copper five times above the reference background concentration. The presence of this element is most likely due to the disposal of waste oils and copper and zinc naphthenate during on-site activities

Surficial geology in the area consists of glacially-derived material underlain by fractured bedrock. The area surrounding the property is typified by medium-to-coarse grained, highly permeable sand. The overburden underlying the property consists of medium-to-coarse grained sand and gravel. Based on Roy F. Weston, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START) on-site reconnaissance observations, the nearest groundwater well is on the Lot No. 5 property. Lot No. 5 has two residents. The groundwater well is 3 feet northeast, while the residence is approximately 75 feet north of the Northern Wood property. The exact locations of private wells in Burke, Vermont are difficult to determine since only

records for wells drilled after 1966 are available from the Groundwater Management Section of the Vermont Agency of Environmental Conservation (VT AEC) and many of the wells in Burke predate 1966. Since the northeastern section of Lyndon falls within 4-radial miles of the Northern Wood property, some of the 1,600 Lyndon residents who rely on private groundwater sources also fall within 4-radial miles of the property.

The Northern Wood property is located approximately 75 feet east of the east Branch of the Passumpsic River (EBPR). Surface water runoff from the property and Route 114 travels through two culverts, under Route 114, and into the EBPR. Along slightly elevated areas at the outfall of the stormwater pipes, START observed silted vegetation (current year leaves) and debris in the vegetation. This indicates that water from the EBPR flowed over the outfall of these stormwater pipes. START assumes that the elevated river level occurred sometime between leaf drop (September/October) and the 13 November 1996 START sampling trip. This suggests that the overland flow route soil sample locations were inundated by the river within 2 months of the START sampling event. Throughout Lyndon, the Passumpsic River (PR) is used for recreational purposes including fishing, swimming, and boating. In addition, the Town of St. Johnsbury Center uses the PR for recreational purposes. Approximately 9.5-downstream miles from the Northern Wood property, Central Vermont Power maintains a hydroelectric power plant along the PR. There are no known drinking water intakes within 15-downstream miles of the property. Several sensitive environments, including wetlands, are located downstream of the property.

The property is currently being used as the East Burke Log Trade log storage yard. During the 14 May 1996 START on-site reconnaissance, three full-time on-site workers and a dog were observed on the property. No residents live on the property. The nearest off-property resident is approximately 75 feet north of the northern property boundary. There are no schools or day-care facilities located within 200 feet of an area of observed contamination on the property. An estimated 313 people live within 1-radial mile of the property, and an estimated 3,400 people live within 4-radial miles of the property. On 13 November 1996, START personnel performed drinking water and river sediment sampling activities adjacent to the Northern Wood property. Barium and manganese, not detected in on-site soils, were found at five to eight times background concentrations in drinking water samples collected from nearby residential wells.

Pyrene and copper were detected in source soil samples and associated locations along the surface water flow route, and these contaminants are attributable to the Northern Wood property. Beryllium, found in sediment samples, is not attributable to the Northern Wood property. Source soil samples determined dieldrin, a pesticide, to be present. At a location along the associated overland flow route, 4,4'-DDT, another pesticide was found, but this contaminant did not duplicate and may be attributable to laboratory error. In general, unless 4,4'-DDT was improperly used or disposed of on the property, it is not used when assessing a property. Since 4,4'-DDT was only detected in one sediment sample and not on the property (source), the pesticide may come from an upgradient property along the storm drainage route [3]. Fluoranthene, a coal tar pitch volatile, could be attributable to the Northern Wood property, but it was not found in on-site source soil samples. Polynuclear Aromatic Hydrocarbons (PAHs) such as pyrene and fluoranthene are typical constituents in urban runoff from black top/asphalt pavement. Runoff from Route 114 is also collected by the stormwater sewer, across from the location where SD-02/SD-03 was collected, and therefore may not be attributable to the Northern Wood property.

NORTHERN WOOD REFERENCES

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**NORTHERN WOOD
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ATTACHMENT A

NORTHERN WOOD

**GROUNDWATER SAMPLE RESULTS
START**

Samples collected 13 November 1996

ATTACHMENT B

NORTHERN WOOD

**SEDIMENT SAMPLE RESULTS
START**

Samples collected 13 November 1996

ATTACHMENT A
NORTHERN WOOD
GROUNDWATER SAMPLE RESULTS
START

Samples collected 13 November 1996

TABLE 1
VOA Modified Method 524.2 Water Analyses
 ug/L

SITE: NORTHERN WOOD
CASE: DAS 0025F SDG: DAF409
LABORATORY: EAS LABORATORIES

	SAMPLE NUMBER:	DAF409	DAF410	DAF411	DAF412
	SAMPLE LOCATION:	DW-01	DW-02	DW-03	TB-02
	LABORATORY NUMBER:	9608189	9608190	9608191	9608192
COMPOUND	CRQL				
Dichlorodifluoromethane	1.0	1.0U	1.0U	1.0U	1.0U
Chloromethane	1.0	1.0U	1.0U	1.0U	1.0U
Vinyl Chloride	1.0	1.0U	1.0U	1.0U	1.0U
Bromomethane	1.0	1.0U	1.0U	1.0U	1.0U
Chloroethane	1.0	1.0U	1.0U	1.0U	1.0U
Trichlorofluoromethane	1.0	1.0U	1.0U	1.0U	1.0U
Acetone	5.0	5.0U	5.0U	5.0U	5.0U
2-Butanone	5.0	5.0U	5.0U	5.0U	5.0U
Tetrahydrofuran	5.0	R	R	R	R
4-Methyl-2-Pentanone	5.0	5.0U	5.0U	5.0U	5.0U
2-Hexanone	5.0	5.0U	5.0U	5.0U	5.0U
1,1-Dichloroethene	1.0	1.0U	1.0U	1.0U	1.0U
Methylene Chloride	1.0	1.0U	1.0U	1.0U	1.9
Carbon Disulfide	1.0	1.0U	1.0U	1.0U	1.0U
Trans-1,2-Dichloroethane	1.0	1.0U	1.0U	1.0U	1.0U
1,1-Dichloroethane	1.0	1.0U	1.0U	1.0U	1.0U
2,2-Dichloropropane	1.0	1.0U	1.0U	1.0U	1.0U
Cis-1,2-Dichloroethene	1.0	1.0U	1.0U	1.0U	1.0U
Chloroform	1.0	1.0U	1.0U	1.0U	4.3
Bromochloromethane	1.0	1.0U	1.0U	1.0U	1.0U
1,1,1-Trichloroethane	1.0	1.0U	1.0U	1.0U	1.0U
1,1-Dichloropropene	1.0	1.0U	1.0U	1.0U	1.0U
Carbon Tetrachloride	1.0	1.0U	1.0U	1.0U	1.0U
1,2-Dichloroethane	1.0	1.0U	1.0U	1.0U	1.0U
Benzene	1.0	1.0U	1.0U	1.0U	1.0U
Trichloroethene	1.0	1.0U	1.0U	1.0U	1.0U
1,2-Dichloropropane	1.0	1.0U	1.0U	1.0U	1.0U
Bromodichloromethane	1.0	1.0U	1.0U	1.0U	1.0U
Dibromomethane	1.0	1.0U	1.0U	1.0U	1.0U
Cis-1,3-Dichloropropene	1.0	1.0U	1.0U	1.0U	1.0U
Toluene	1.0	1.0U	1.0U	1.0U	1.0U
Trans-1,3-Dichloropropene	1.0	1.0U	1.0U	1.0U	1.0U
1,1,2-Trichloroethane	1.0	1.0U	1.0U	1.0U	1.0U
1,3-Dichloropropane	1.0	1.0U	1.0U	1.0U	1.0U
Tetrachloroethene	1.0	1.0U	1.0U	1.0U	1.0U
Dibromochloromethane	1.0	1.0U	1.0U	1.0U	1.0U
1,2-Dibromoethane	1.0	1.0U	1.0U	1.0U	1.0U
Chlorobenzene	1.0	1.0U	1.0U	1.0U	1.0U
1,1,1,2-Tetrachloroethane	1.0	1.0U	1.0U	1.0U	1.0U
Ethylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
m/p-Xylene	1.0	1.0U	1.0U	1.0U	1.0U
o-Xylene	1.0	1.0U	1.0U	1.0U	1.0U
Styrene	1.0	1.0U	1.0U	1.0U	1.0U
Bromoform	1.0	1.0U	1.0U	1.0U	1.0U
Isopropylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
1,1,2,2-Tetrachloroethane	1.0	1.0U	1.0U	1.0U	1.0U
1,2,3-Trichloropropane	1.0	1.0U	1.0U	1.0U	1.0U
Bromobenzene	1.0	1.0U	1.0U	1.0U	1.0U
n-Propylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
2-Chlorotoluene	1.0	1.0U	1.0U	1.0U	1.0U
1,3,5-Trimethylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
4-Chlorotoluene	1.0	1.0U	1.0U	1.0U	1.0U
p-Isopropyltoluene	1.0	1.0U	1.0U	1.0U	1.0U
1,2,4-Trimethylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
sec-Butylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
tert-Butylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
1,3-Dichlorobenzene	1.0	1.0U	1.0U	1.0U	1.0U
1,4-Dichlorobenzene	1.0	1.0U	1.0U	1.0U	1.0U
n-Butylbenzene	1.0	1.0U	1.0U	1.0U	1.0U
1,2-Dichlorobenzene	1.0	1.0U	1.0U	1.0U	1.0U
1,2-Dibromo-3-Chloropropane	1.0	1.0U	1.0U	1.0U	1.0U
1,2,4-Trichlorobenzene	1.0	1.0U	1.0U	1.0U	1.0U
Hexachlorobutadiene	1.0	1.0U	1.0U	1.0U	1.0U
Naphthalene	1.0	1.0U	1.0U	1.0U	1.0U
1,2,3-Trichlorobenzene	1.0	1.0U	1.0U	1.0U	1.0U
DILUTION FACTOR:		1.0	1.0	1.0	1.0
DATE SAMPLED:		11/13/96	11/13/96	11/13/96	11/13/96
DATE ANALYZED:		11/19/96	11/19/96	11/19/96	11/19/96

SITE: NORTHERN WOOD
CASE: 26160 SDG: AMJ69
LABORATORY: IEA, Inc.

TABLE 2
VOLATILE AQUEOUS ANALYSIS
ug/L

SAMPLE NUMBER: AMJ74 AMJ75
SAMPLE LOCATION: TB-01 RB-01
LABORATORY NUMBER: 962518A-06 962518A-07

COMPOUND	CRQL		
Chloromethane	10	10 U	10 U
Bromomethane	10	10 U	10 U
Vinyl Chloride	10	10 U	10 U
Chloroethane	10	10 U	10 U
Methylene Chloride	10	2 J	10 U
Acetone	10	10 U	10 U
Carbon Disulfide	10	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U
1,2-Dichloroethane (Total)	10	10 U	10 U
Chloroform	10	5 J	10 U
1,2-Dichloroethane	10	10 U	10 U
2-Butanone	10	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U
Bromodichloromethane	10	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U
Trichloroethene	10	10 U	10 U
Dibromochloromethane	10	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U
Benzene	10	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U
Bromoform	10	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U
2-Hexanone	10	10 U	10 U
Tetrachloroethene	10	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U
Toluene	10	10 U	10 U
Chlorobenzene	10	10 U	10 U
Ethylbenzene	10	10 U	10 U
Styrene	10	10 U	10 U
Xylene (total)	10	10 U	10 U

DILUTION FACTOR: 1.0 1.0
DATE SAMPLED: 11/13/96 11/13/96
DATE ANALYZED: 11/21/96 11/21/96

SITE: NORTHERN WOOD
CASE: 25150 SDG: AMJ89
LABORATORY: IEA, Inc.

TABLE 4
SEMIVOLATILE WATER ANALYSIS
ug/L

	AMJ75	AMJ76	AMJ77	AMJ78
SAMPLE NUMBER:	RB-01	DW-01	DW-02	DW-03
SAMPLE LOCATION:				
LABORATORY NUMBER:	962518A-07	962518A-08	962518A-09	962518A-10
COMPOUND	CRQL			
Phenol	10	10 U	10 U	10 U
bis(2-Chloroethyl) ether	10	10 U	10 U	10 U
2-Chlorophenol	10	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U
2-Methylphenol	10	10 U	10 U	10 U
2,2'-Oxybis(1-chloropropane)	10	10 UJ	10 UJ	10 UJ
4-Methylphenol	10	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10	10 U	10 U	10 U
Hexachloroethane	10	10 U	10 U	10 U
Nitrobenzene	10	10 U	10 U	10 U
Isophorone	10	10 U	10 U	10 U
2-Nitrophenol	10	10 U	10 U	10 U
2,4-Dimethylphenol	10	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10	10 U	10 U	10 U
2,4-Dichlorophenol	10	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U
Naphthalene	10	10 U	10 U	10 U
4-Chloroaniline	10	10 U	10 U	10 U
Hexachlorobutadiene	10	10 U	10 U	10 U
4-Chloro-3-methylphenol	10	10 U	10 U	10 U
2-Methylnaphthalene	10	10 U	10 U	10 U
Hexachlorocyclopentadiene	10	10 UJ	10 UJ	10 UJ
2,4,6-Trichlorophenol	10	10 U	10 U	10 U
2,4,5-Trichlorophenol	25	25 U	25 U	25 U
2-Chloronaphthalene	10	10 U	10 U	10 U
2-Nitroaniline	25	25 U	25 U	25 U
Dimethylphthalate	10	10 U	10 U	10 U
Acenaphthylene	10	10 U	10 U	10 U
2,6-Dinitrotoluene	10	10 U	10 U	10 U
3-Nitroaniline	25	25 U	25 U	25 U
Acenaphthene	10	10 U	10 U	10 U
2,4-Dinitrophenol	25	25 U	25 U	25 U
4-Nitrophenol	25	25 U	25 U	25 U
Dibenzofuran	10	10 U	10 U	10 U
2,4-Dinitrotoluene	10	10 U	10 U	10 U
Diethylphthalate	10	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10	10 U	10 U	10 U
Fluorene	10	10 U	10 U	10 U
4-Nitroaniline	25	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25	25 U	25 U	25 U
N-Nitrosodiphenylamine(1)	10	10 U	10 U	10 U
4-Bromophenyl-phenylether	10	10 U	10 U	10 U
Hexachlorobenzene	10	10 U	10 U	10 U
Pentachlorophenol	25	25 U	25 U	25 U
Phenanthrene	10	10 U	10 U	10 U
Anthracene	10	10 U	10 U	10 U
Carbazole	10	10 U	10 U	10 U
Di-n-butylphthalate	10	10 U	10 U	10 U
Fluoranthene	10	10 U	10 U	10 U
Pyrene	10	10 U	10 U	10 U
Butylbenzylphthalate	10	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10	10 U	10 U	10 U
Benzo(a)anthracene	10	10 U	10 U	10 U
Chrysene	10	10 U	10 U	10 U
Bis(2-ethylhexyl)phthalate	10	10 U	10 U	10 U
Di-n-octylphthalate	10	10 U	10 U	10 U
Benzo(b)fluoranthene	10	10 U	10 U	10 U
Benzo(k)fluoranthene	10	10 U	10 U	10 U
Benzo(a)pyrene	10	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10	10 U	10 U	10 U
Dibenz(a,h)anthracene	10	10 U	10 U	10 U
Benzo(g,h,i)perylene	10	10 U	10 U	10 U
DILUTION FACTOR:	1.0	1.0	1.0	1.0
DATE SAMPLED:	11/13/96	11/13/96	11/13/96	11/13/96
DATE EXTRACTED:	11/19/96	11/19/96	11/19/96	11/19/96
DATE ANALYZED:	11/25/96	11/25/96	11/25/96	11/25/96

*RESULT REPORTED FROM DILUTED ANALYSIS

SITE: NORTHERN WOOD
CASE: 25150 SDG: AMJ69
LABORATORY: IEA, Inc.

TABLE 6
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSIS
ug/L

	SAMPLE NUMBER:	AMJ75	AMJ76	AMJ77	AMJ78
	SAMPLE LOCATION:	RB-01	DW-01	DW-02	DW-03
	LABORATORY NUMBER:	962518A-07	962518A-08	962518A-09	962518A-10
COMPOUND	CRQL				
alpha-BHC	0.05	0.05 U	0.05 U	0.05 U	0.05 U
beta-BHC	0.05	0.05 U	0.05 U	0.05 U	0.05 U
delta-BHC	0.05	0.05 U	0.05 U	0.05 U	0.05 U
gamma-BHC(Lindane)	0.05	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor	0.05	0.05 U	0.05 U	0.05 U	0.05 U
Aldrin	0.05	R	R	R	R
Heptachlor Epoxide	0.05	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan I	0.05	0.05 U	0.05 U	0.05 U	0.05 U
Dieldrin	0.10	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.10	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	0.10	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan II	0.10	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDD	0.10	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan Sulfate	0.10	R	R	R	R
4,4'-DDT	0.10	0.1 U	0.1 U	0.0041 J	0.1 U
Methoxychlor	0.5	0.5 U	0.5 U	0.5 U	0.5 U
Endrin Ketone	0.10	0.1 U	0.1 U	0.1 U	0.1 U
Endrin-Aldehyde	0.10	0.1 U	0.1 U	0.1 U	0.1 U
alpha-Chlordane	0.05	0.05 U	0.05 U	0.05 U	0.05 U
gamma-Chlordane	0.05	0.05 U	0.05 U	0.05 U	0.05 U
Toxaphene	5.0	5 U	5 U	5 U	5 U
Aroclor-1016	1.0	1 U	1 U	1 U	1 U
Aroclor-1221	2.0	2 U	2 U	2 U	2 U
Aroclor-1232	1.0	1 U	1 U	1 U	1 U
Aroclor-1242	1.0	1 U	1 U	1 U	1 U
Aroclor-1246	1.0	1 U	1 U	1 U	1 U
Aroclor-1254	1.0	1 U	1 U	1 U	1 U
Aroclor-1260	1.0	1 U	1 U	1 U	1 U
DILUTION FACTOR:		1	1	1	1
DATE SAMPLED:		11/13/96	11/13/96	11/13/96	11/13/96
DATE EXTRACTED:		11/15/96	11/15/96	11/15/96	11/15/96
DATE ANALYZED:		11/29/96	11/29/96	11/29/96	11/29/96

SITE: NORTHERN WOOD

TABLE 2
INORGANIC WATER ANALYSIS
ug/L

CASE: 25150 SDG: MAKD85
LABORATORY: SOUTHWEST LAB OF OKLAHOMA

SAMPLE NUMBER:	MAKD91	MAKD92	MAKD93	MAKD94
SAMPLE LOCATION:	RB-01	DW-01	DW-02	DW-03
LABORATORY NUMBER:	27627.07	27627.08	27627.09	27627.10

INORGANIC ELEMENTS		INSTRUMENT DETECTION LIMITS (ug/L)					CONTRACT DETECTION LIMITS (ug/L)
ALUMINUM	P	17.0	--	--	--	--	200
ANTIMONY	P	3.0	--	--	--	--	60
ARSENIC	P	3.0	--	--	--	--	10
BARIUM	P	1.0	--	96.1	93.9	19.2	200
BERYLLIUM	P	1.0	--	--	--	--	5
CADMIUM	P	1.0	--	--	--	--	5
CALCIUM	P	10.0	11.3 UJ	28800	28000	31000	5000
CHROMIUM	P	1.0	--	--	--	--	10
COBALT	P	1.0	--	--	--	--	50
COPPER	P	1.0	--	--	1.0 J	11.9	25
IRON	P	10.0	40.5 U	73.9	67.5	155	100
LEAD	P	1.0	--	--	--	1.1 J	3
MAGNESIUM	P	22.0	--	4530	4370	3680	5000
MANGANESE	P	1.0	--	28.1	27.2	3.5	15
MERCURY	CV	0.20	--	--	--	--	0.2
NICKEL	P	1.0	--	--	--	1.2 J	40
POTASSIUM	P	41.0	44.6 UJ	3620	3590	4140	5000
SELENIUM	P	4.0	--	--	--	--	5
SILVER	P	1.0	--	--	--	--	10
SODIUM	P	36.0	85.9 UJ	7990 J	7830 J	7250 J	5000
THALLIUM	P	2.0	--	--	--	--	10
VANADIUM	P	1.0	--	--	--	--	50
ZINC	P	2.0	10.1 U	--	13.1 U	13.8 U	20
CYANIDE	AS	2.0	--	--	2.8 UJ	--	10

ANALYTICAL METHOD
F - FURNACE
P - ICP/FLAME AA
CV - COLD VAPOR
AS - SEMI AUTOMATED
SPECTROPHOTOMETRIC
CA - MIDI-DISTILLATION
SPECTROPHOTOMETRIC

NOTE: J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED
IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
-- VALUE IS NON-DETECTED
U - VALUE IS NON-DETECTED AND DETECTION LIMIT IS RAISED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.

ATTACHMENT B

NORTHERN WOOD

**SEDIMENT SAMPLE RESULTS
START**

Samples collected 13 November 1996

SITE: NORTHERN WOOD
CASE: 25150 SDG: AMJ69
LABORATORY: IEA, Inc.

TABLE 1
VOLATILE SOIL ANALYSIS - LOW LEVEL
ug/kg

	AMJ69	AMJ70	AMJ71	AMJ72	AMJ73
SAMPLE NUMBER:	SD-01	SD-02	SD-03	SD-04	SD-05
SAMPLE LOCATION:					
LABORATORY NUMBER:	962518A-01	962518A-02	962518A-03	962518A-04	962518A-05
COMPOUND	CRQL				
Chloromethane	10	12 U	14 U	16 U	11 U
Bromomethane	10	12 U	14 U	16 U	11 U
Vinyl Chloride	10	12 U	14 U	16 U	11 U
Chloroethane	10	12 U	14 U	16 U	11 U
Methylene Chloride	10	12 U	14 U	16 U	11 U
Acetone	10	12 U	14 U	32 U	16 U
Carbon Disulfide	10	12 U	14 U	16 U	11 U
1,1-Dichloroethene	10	12 U	14 U	16 U	11 U
1,1-Dichloroethane	10	12 U	14 U	16 U	11 U
1,2-Dichloroethene (Total)	10	12 U	14 U	16 U	11 U
Chloroform	10	12 U	14 U	16 U	11 U
1,2-Dichloroethane	10	12 U	14 U	16 U	11 U
2-Butanone	10	12 U	14 U	16 U	11 U
1,1,1-Trichloroethane	10	12 U	14 U	16 U	11 U
Carbon Tetrachloride	10	12 U	14 U	16 U	11 U
Bromodichloromethane	10	12 U	14 U	16 U	11 U
1,2-Dichloropropane	10	12 U	14 U	16 U	11 U
cis-1,3-Dichloropropene	10	12 U	14 U	16 U	11 U
Trichloroethene	10	12 U	14 U	16 U	11 U
Dibromochloromethane	10	12 U	14 U	16 U	11 U
1,1,2-Trichloroethane	10	12 U	14 U	16 U	11 U
Benzene	10	12 U	14 U	16 U	11 U
trans-1,3-Dichloropropene	10	12 U	14 U	16 U	11 U
Bromoform	10	12 U	14 U	16 U	11 U
4-Methyl-2-pentanone	10	12 U	14 U	16 U	11 U
2-Hexanone	10	12 U	14 U	16 U	11 U
Tetrachloroethene	10	12 U	14 U	16 U	11 U
1,1,2,2-Tetrachloroethane	10	12 U	14 U	16 U	11 U
Toluene	10	0.8 J	14 U	16 U	11 U
Chlorobenzene	10	12 U	14 U	16 U	11 U
Ethylbenzene	10	12 U	14 U	16 U	11 U
Styrene	10	0.7 J	14 U	16 U	11 U
Xylene (total)	10	1 J	14 U	16 U	11 U
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:	11/13/96	11/13/96	11/13/96	11/13/96	11/13/96
DATE ANALYZED:	11/21/96	11/21/96	11/21/96	11/21/96	11/21/96
% MOISTURE:	20	31	38	7	17

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: NORTHERN WOOD
CASE: Z5150 SDG: AMJ63
LABORATORY: IEA, Inc.

TABLE 3
SEMIVOLATILE SOIL ANALYSIS
ug/Kg

SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY NUMBER:	AMJ69 SD-01 962518A-01	AMJ70 SD-02 962518A-02	AMJ71 SD-03 962518A-03	AMJ72 SD-04 962518A-04	AMJ73 SD-05 962518A-05
COMPCUND	CRCL				
Phenol	330	390 U	550 U	510 U	360 U 410 U
bis(2-Chloroethyl) ether	330	390 U	550 U	510 U	360 U 410 U
2-Chlorophenol	330	390 U	550 U	510 U	360 U 410 U
1,3-Dichlorobenzene	330	390 U	550 U	510 U	360 U 410 U
1,4-Dichlorobenzene	330	390 U	550 U	510 U	360 U 410 U
1,2-Dichlorobenzene	330	390 U	550 U	510 U	360 U 410 U
2-Methylphenol	330	390 U	550 U	510 U	360 U 410 U
2,2'-Oxybis(1-chloropropane)	330	390 U	550 U	510 U	360 U 410 U
4-Methylphenol	330	390 U	550 U	510 U	360 U 410 U
N-Nitroso-di-n-propylamine	330	390 U	550 U	510 U	360 U 410 U
Hexachloroethane	330	390 U	550 U	510 U	360 U 410 U
Nitrobenzene	330	390 U	550 U	510 U	360 U 410 U
Isophorone	330	390 U	550 U	510 U	360 U 410 U
2-Nitrophenol	330	390 U	550 U	510 U	360 U 410 U
2,4-Dimethylphenol	330	390 U	550 U	510 U	360 U 410 U
bis(2-Chloroethoxy)methane	330	390 U	550 U	510 U	360 U 410 U
2,4-Dichlorophenol	330	390 U	550 U	510 U	360 U 410 U
1,2,4-Trichlorobenzene	330	390 U	550 U	510 U	360 U 410 U
Naphthalene	330	390 U	550 U	510 U	360 U 410 U
4-Chloroaniline	330	390 U	550 U	510 U	360 U 410 U
Hexachlorobutadiene	330	390 U	550 U	510 U	360 U 410 U
4-Chloro-3-methylphenol	330	390 U	550 U	510 U	360 U 410 U
2-Methylnaphthalene	330	390 U	550 U	510 U	360 U 410 U
Hexachlorocyclopentadiene	330	390 U	550 U	510 U	360 U 410 U
2,4,6-Trichlorophenol	330	390 U	550 U	510 U	360 U 410 U
2,4,5-Trichlorophenol	800	990 U	1400 U	1300 U	910 U 1000 U
2-Chloronaphthalene	330	390 U	550 U	510 U	360 U 410 U
2-Nitroaniline	800	990 U	1400 U	1300 U	910 U 1000 U
Dimethylphthalate	330	390 U	550 U	510 U	360 U 410 U
Acenaphthylene	330	390 U	30 J	36 J	360 U 410 U
2,6-Dinitrotoluene	330	390 U	550 U	510 U	360 U 410 U
3-Nitroaniline	800	990 U	1400 U	1300 U	910 U 1000 U
Acenaphthene	330	390 U	550 U	510 U	360 U 410 U
2,4-Dinitrophenol	800	990 U	1400 U	1300 U	910 U 1000 U
4-Nitrophenol	800	990 U	1400 U	1300 U	910 U 1000 U
Dibenzofuran	330	390 U	550 U	510 U	360 U 410 U
2,4-Dinitrotoluene	330	390 U	550 U	510 U	360 U 410 U
Diethylphthalate	330	390 U	550 U	510 U	360 U 410 U
4-Chlorophenyl-phenylether	330	390 U	550 U	510 U	360 U 410 U
Fluorene	330	390 U	550 U	32 J	360 U 410 U
4-Nitroaniline	800	990 U	1400 U	1300 U	910 U 1000 U
4,6-Dinitro-2-methylphenol	800	990 U	1400 U	1300 U	910 U 1000 U
N-Nitrosodiphenylamine(1)	330	390 U	550 U	510 U	360 U 410 U
4-Bromophenyl-phenylether	330	390 U	550 U	510 U	360 U 410 U
Hexachlorobenzene	330	390 U	550 U	510 U	360 U 410 U
Pentachlorophenol	800	990 U	1400 U	1300 U	910 U 1000 U
Phenanthrene	330	390 U	94 J	230 J	360 U 410 U
Anthracene	330	390 U	22 J	48 J	360 U 410 U
Carbazole	330	390 U	550 U	510 U	360 U 410 U
Di-n-butylphthalate	330	390 U	550 U	510 U	360 U 410 U
Fluoranthene	330	390 U	85 J	180 J	19 J 25 J
Pyrene	330	390 U	140 J	240 J	30 J 22 J
Butylbenzylphthalate	330	390 U	550 U	510 U	360 U 410 U
3,3'-Dichlorobenzidine	330	390 U	550 U	510 U	360 U 410 U
Benzo(a)anthracene	330	390 U	74 J	120 J	17 J 410 U
Chrysene	330	390 U	120 J	160 J	39 J 410 U
Bis(2-ethylhexyl)phthalate	330	390 U	550 U	510 U	360 U 940 U
Di-n-octylphthalate	330	390 U	550 U	510 U	360 U 410 U
Benzo(b)fluoranthene	330	390 U	54 J	87 J	22 J 410 U
Benzo(k)fluoranthene	330	390 U	85 J	80 J	17 J 410 U
Benzo(a)pyrene	330	390 U	91 J	110 J	25 J 410 U
Indeno(1,2,3-cd)pyrene	330	390 U	26 J	49 J	10 J 410 U
Dibenz(a,h)anthracene	330	390 U	550 U	510 U	360 U 410 U
Benzo(g,h,i)perylene	330	390 U	19 J	24 J	360 U 410 U
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:	11/13/96	11/13/96	11/13/96	11/13/96	11/13/96
DATE EXTRACTED:	11/22/96	11/22/96	11/22/96	11/22/96	11/22/96
DATE ANALYZED:	11/26/96	11/26/96	11/26/96	11/26/96	11/26/96
% MOISTURE	16	40	35	9	19

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: NORTHERN WOOD
CASE: 25150 SDG: AMJ69
LABORATORY: IEA, Inc.

TABLE 5
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSIS
ug/kg

	AMJ69	AMJ70	AMJ71	AMJ72	AMJ73	
SAMPLE NUMBER:	AMJ69	AMJ70	AMJ71	AMJ72	AMJ73	
SAMPLE LOCATION:	SD-01	SD-02	SD-03	SD-04	SD-05	
LABORATORY NUMBER:	962518A-01	962518A-02	962518A-03	962518A-04	962518A-05	
COMPOUND	CRQL					
alpha-BHC	1.7	2.0 U	2.8 U	2.7 U	1.9 U	2.0 U
beta-BHC	1.7	2.0 U	2.8 U	2.7 U	1.9 U	2.0 U
delta-BHC	1.7	2.0 U	2.8 U	2.7 U	1.9 U	2.0 U
gamma-BHC(Lindane)	1.7	2.0 U	2.8 U	2.7 U	1.9 U	2.0 U
Heptachlor	1.7	2.0 U	2.8 U	2.7 U	1.9 U	2.0 U
Aldrin	1.7	R	0.48 J	0.18 J	R	R
Heptachlor Epoxide	1.7	0.34 J	R	R	1.9 U	2.0 U
Endosulfan I	1.7	2.0 U	2.8 U	2.7 U	1.9 U	2.0 U
Dieldrin	3.3	3.9 U	5.5 U	0.33 J	3.6 U	4.0 U
4,4'-DDE	3.3	3.9 U	5.5 U	5.3 U	3.6 U	4.0 U
Endrin	3.3	3.9 U	5.5 U	5.3 U	3.6 U	4.0 U
Endosulfan II	3.3	3.9 U	5.5 U	5.3 U	3.6 U	4.0 U
4,4'-DDD	3.3	3.9 U	5.5 U	5.3 U	3.6 U	4.0 U
Endosulfan Sulfate	3.3	R	R	R	R	R
4,4'-DDT	3.3	0.15 J	5.5 U	0.94 J	3.6 U	0.1 J
Methoxychlor	17	20 U	2.8 U	27 U	19 U	20 U
Endrin Ketone	3.3	3.9 U	3.7 J	5.3 U	3.6 U	4.0 U
Endrin-Aldehyde	3.3	3.9 U	5.5 U	5.3 U	3.6 U	4.0 U
alpha-Chlordane	1.7	2.0 U	R	2.7 U	1.9 U	2.0 U
gamma-Chlordane	1.7	2.0 U	2.8 U	2.7 U	1.9 U	2.0 U
Toxaphene	170	200 U	280 U	270 U	190 U	200 U
Aroclor-1016	33	39 U	55 U	53 U	36 U	40 U
Aroclor-1221	67	80 U	110 U	110 U	74 U	81 U
Aroclor-1232	33	39 U	55 U	53 U	36 U	40 U
Aroclor-1242	33	39 U	55 U	53 U	36 U	40 U
Aroclor-1248	33	39 U	55 U	53 U	36 U	40 U
Aroclor-1254	33	39 U	55 U	53 U	36 U	40 U
Aroclor-1260	33	80 U	55 U	53 U	36 U	40 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		11/13/96	11/13/96	11/13/96	11/13/96	11/13/96
DATE EXTRACTED:		11/18/96	11/18/96	11/18/96	11/18/96	11/18/96
DATE ANALYZED:		12/04/96	12/04/96	12/04/96	12/09/96	12/04/96
% MOISTURE:		16	40	38	9	17

NOTE: RESULTS REPORTED ON A DRY WEIGHT BASIS.

SITE: NORTHERN WOOD

CASE: 25150 SDG: MAKDB5
 LABORATORY: SOUTHWEST LAB OF OKLAHOMA

TABLE 1
 INORGANIC SOIL ANALYSES
 mg/kg

SAMPLE NUMBER:	MAKD85	MAKD86	MAKD87	MAKD88	MAKD89	MAKD90
SAMPLE LOCATION:	SD-01	SD-02	SD-03	SD-04	SD-05	SD-06
LABORATORY NUMBER:	27627.01	27627.02	27627.03	27627.04	27627.05	27627.06
% SOLIDS	80.5	62.8	65.2	91.3	83.0	77.6

INORGANIC ELEMENTS		INSTRUMENT DETECTION LIMITS (mg/kg)							CONTRACT DETECTION LIMITS (mg/kg)
ALUMINUM	P	3.4	3800	10700	11700	3960	2720	4430	40
ANTIMONY	P	0.60	0.75 U	0.96 U	0.92 U	0.66 U	0.97 J	0.77 U	12
ARSENIC	P	0.60	1.4 J	2.4	2.5	1.4	1.3 J	1.3 J	2
BARIUM	P	0.20	30.0	56.7	60.3	23.3	13.4	30.8	40
BERYLLIUM	P	0.20	0.25 U	0.48 J	0.52 J	0.22 J	0.24 U	0.26 U	1
CADMIUM	P	0.20	0.25 U	0.32 U	0.31 U	0.22 U	0.24 U	0.26 U	1
CALCIUM	P	2.0	2280	4770	4920	4560	1460	1670	1000
CHROMIUM	P	0.20	8.4	27.8	28.8	10.7	9.2	10.2	2
COBALT	P	0.20	3.9	8.3	8.8	3.5	2.2	3.5	10
COPPER	P	0.20	3.8	14.1	14.9	9.2	3.4	4.4	5
IRON	P	2.0	14400 J	14700 J	15700 J	6130 J	4630 J	6950 J	20
LEAD	P	0.20	2.8 J	21.9 J	25.2 J	21.2 J	59.7 J	22.7 J	0.6
MAGNESIUM	P	4.4	2110	5120	5460	1890	1450	2250	1000
MANGANESE	P	0.20	207 J	438 J	443 J	152 J	100 J	270 J	3
MERCURY	CV	0.10	0.12 U	0.16 U	0.15 U	0.11 U	0.12 U	0.13 U	0.1
NICKEL	P	0.20	8.9	20.6	20.5	8.8	6.8	8.1	8
POTASSIUM	P	8.20	696	1610	1730	866	424	773	1000
SELENIUM	F	0.80	0.99 U	1.3 U	1.2 U	0.88 U	0.96 U	1.0 U	1
SILVER	P	0.20	0.25 U	0.32 U	0.31 U	0.22 U	0.24 U	0.26 U	2
SODIUM	P	7.2	231 U	463 U	422 U	273 U	232 U	280 U	1000
THALLIUM	P	0.40	1.2 U	1.8 U	1.4 U	0.53 U	0.48 U	0.80 U	2
VANADIUM	P	0.20	11.1	26.2	27.9	9.9	7.0	11.8	10
ZINC	P	0.40	22.7	59.9	66.1	63.4	13.5	24.4	4
CYANIDE	AS	0.10	0.12 UJ	0.30 UJ	0.40 UJ	0.40 UJ	0.17 UJ	NA	2.5

ANALYTICAL METHOD
 F - FURNACE
 P - ICP/FLAME AA
 CV - COLD VAPOR
 AS - SEMI AUTOMATED
 SPECTROPHOTOMETRIC
 CA - MIDI-DISTILLATION
 SPECTROPHOTOMETRIC

NOTE: J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED
 IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
 -- VALUE IS NON-DETECTED.
 U - VALUE IS NON-DETECTED AND DETECTION LIMIT IS RAISED.
 UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
 R - VALUE IS REJECTED.
 NA - NOT ANALYZED.

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS