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**Linemaster Switch Superfund Site**

**Woodstock**

**Connecticut**

**Superfund Records Center**

SITE: U-60940

BREAK: 83

OTHER: U60940

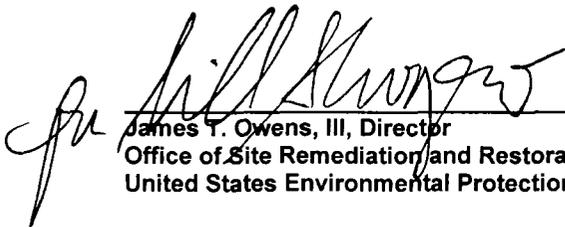
**SEPTEMBER 2009**

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\_\_\_\_\_  
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9-29-09

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WOODSTOCK, CONNECTICUT**

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## ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
Cis-1,2-DCE	1,2-Dichloroethylene
COC	Contaminant of Concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CTDEP	Connecticut Department of Environmental Protection
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
gpm	gallons per minute
LSC	Linemaster Switch Corporation
LTM	Long-Term Monitoring
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NPL	National Priorities List
O&M	Operations and Maintenance
OSWER	Office of Solid Waste and Emergency Response
ppb	parts per billion
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAP	Sampling and Analysis Plan
TBC	To Be Considered
TCE	Trichloroethylene
µg/L	micrograms per liter
VOC	Volatile Organic Compound

## EXECUTIVE SUMMARY

This is the second Five-Year Review for the Linemaster Switch Corporation (LSC) Superfund Site (the LSC Site) located in Woodstock, Connecticut. The review was conducted in accordance with United States Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response (OSWER) Guidance No. 9355.7-03B-P. This statutory Five-Year review is required because hazardous contamination remains at the LSC Site above levels that allow for unlimited use and unrestricted exposure. The triggering action for this statutory Five-Year review is based on the completion of the last Five-Year Review, conducted in May 2004.

The remedy specified in the July 21, 1993 Record of Decision (ROD) included in-situ vacuum extraction of contaminated soil to remove volatile organic compounds (VOCs). Carbon air emission controls were included to prevent transfer of soil VOCs to the atmosphere. Soil cleanup was estimated to be reached in 3 to 10 years. If the soil cleanup levels were not achieved in the estimated timeframe, enhancement of the soil vapor extraction system (i.e., with air sparging) was provided for to achieve the goals. Subsequently, EPA determined that the vapor extraction component of the dual vapor extraction (DVE) system was no longer significantly contributing to the remediation of the LSC Site and that further remediation via vapor extraction should not be pursued. In December 2004, EPA signed an Explanation of Significant Differences (ESD) to the ROD. The remedy was revised for the LSC Site to discontinue operation of the vacuum extraction component of the DVE system while maintaining continued operation of the groundwater extraction and treatment component of the system. EPA did not change the cleanup objectives for the LSC Site, or any of the cleanup levels provided in the 1993 ROD. This modified remedy does not rely on vapor extraction for further remediation of soil. Rather, the soil cleanup levels presented in the ROD will be achieved through the flushing of contaminants via the continued operation of the groundwater extraction component of the DVE system within a period of time found to be consistent with the ROD objectives. The vapor extraction component of the DVE system was permanently decommissioned in 2004.

As discussed in the First Five-Year Review, a comparison of the remedial action objectives, as identified in the 1993 Record of Decision (ROD), to the current performance of the groundwater extraction portion of the DVE system demonstrates that the remedy has reduced the risks to human health and the environment. Pumping from the groundwater extraction wells has

prevented further migration of groundwater contamination beyond the LSC Site, and in many parts of the LSC Site, the concentration of groundwater contaminants has been reduced to below drinking water standards. In addition, the potential for exposure to contaminated soil and groundwater has been addressed through institutional controls in the form of deed restrictions. Surface water sampling conducted during the past 5 years has not detected a release of hazardous substances from the LSC Site. All off-site residential wells are non-detect for those compounds analyzed, demonstrating the continued effectiveness of the treatment system in controlling groundwater VOC migration from the Linemaster facility.

This Five-Year Review has identified issues which require further evaluation. One issue identified in the Five-Year Review concerns potential vapor intrusion risks on the LSC property. EPA's protocol for evaluating vapor intrusion has evolved since the last Five-Year Review was conducted and additional evaluation of this exposure pathway is warranted to determine the current and future protectiveness of the remedy.

Another issue is that the groundwater and drinking water investigations have not included 1,4-dioxane as a target analyte. This compound was used in the past with chlorinated solvents as a stabilizer and a corrosion inhibitor. However, recent improvements in analytical methods have now made it possible for 1,4-dioxane to be detected at concentrations similar to other volatile compounds. Currently, no federal drinking water standard exists for 1,4-dioxane. Also, the groundwater and drinking water investigations have not included manganese. In 2004, EPA issued a health advisory due to health concerns from chronic exposure to high doses of manganese. Sampling should include manganese. Groundwater sampling for 1,4-dioxane and manganese will begin within the next 12 months.

Institutional controls in the form of deed restrictions were recorded at the Site in 2005. The State of Connecticut has agreed to accept a transfer of title from the United States for these deed restrictions. This transfer should be accomplished within the next 18 months. Although the deed restrictions prohibit excavation in certain areas of the Site, a review should be performed prior to a transfer to the State of Connecticut to determine whether the deed restrictions should also require that the cover installed over contaminated soils remain in place until soil and groundwater cleanup levels are attained.

Finally, there is an increasing trend of trichloroethylene (TCE) concentrations in monitoring well MW28DB since 2001. This well appears to be located on a groundwater divide at the leading edge of the plume, and there are no deep bedrock monitoring wells located west of MW28DB to confirm that the contaminant plume is not expanding beyond the leading edge of the plume in this area. At this time, the cause of the increasing VOC concentration trend at this well is unknown. Sampling and analysis at location MW28DB will continue to be monitored quarterly, and evaluation of trends in this portion of the plume will continue to determine if additional evaluation and/or measures are necessary. This, however, does not affect the current protectiveness of human health and the environment, as groundwater in this area is not being consumed.

Based on the review and evaluation of data collected at the Site in the past five years, EPA is deferring its determination as to whether the remedy is currently protective of human health and the environment until a vapor intrusion study and a groundwater investigation for 1,4-dioxane and manganese is completed. This determination will be made in September 2012.

In addition, the next Five-Year Review for the Site is scheduled for completion in 2014.

FIVE-YEAR REVIEW SUMMARY FORM			
SITE IDENTIFICATION			
Site name ( from WasteLAN): Linemaster Switch Corporation Superfund Site			
EPA ID (from WasteLAN): CTD001153923			
Region: 1	State: CT	City/County: Woodstock/Windham	
SITE STATUS			
NPL Status:	<input checked="" type="checkbox"/> Final	<input type="checkbox"/> Deleted	<input type="checkbox"/> Other (Specify)
Remediation Status (choose all that apply):	<input type="checkbox"/> Under Construction	<input checked="" type="checkbox"/> Operating	<input type="checkbox"/> Complete
Multiple OUs?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	Construction completion date: 3-29-05 (PCOR)
Has site been put into reuse?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	
REVIEW STATUS			
Lead agency:	<input checked="" type="checkbox"/> EPA	<input type="checkbox"/> State	<input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency:
Author name: Leslie McVickar			
Author title: Remedial Project Manager		Author affiliation: U.S. Environmental Protection Agency	
Review period: March – July 2009			
Date(s) of site inspection: March 8, 2009			
Type of review:	<input checked="" type="checkbox"/> Post-SARA	<input type="checkbox"/> Pre-SARA	<input type="checkbox"/> NPL-Removal only
	<input type="checkbox"/> Non-NPL Remedial Action Site		<input type="checkbox"/> NPL State/Tribe-lead
	<input type="checkbox"/> Regional Discretion		
Review number	<input type="checkbox"/> 1 (first)	<input checked="" type="checkbox"/> 2 (second)	<input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)
<b>Triggering action</b>			
<input type="checkbox"/> Actual RA Onsite Construction at OU #	<input type="checkbox"/> Actual RA Start at OU#		<input checked="" type="checkbox"/> Previous Five-Year Review Report
<input type="checkbox"/> Construction Completion			
<input type="checkbox"/> Other (specify)			
Triggering action date (from WasteLAN): May 24, 2004			
Due date (five years after triggering action date): May 24, 2009			

**Issues:**

- Potential vapor intrusion pathway concerns exist for buildings located on-site.
- Sampling of groundwater and drinking water currently does not include 1,4-dioxane and manganese.
- There are increasing contaminant concentrations in the vicinity of in groundwater well MW28DB.

**Recommendations and Follow-up Actions:**

- Determine whether the vapor intrusion pathway presents an on-site risk and implement *mitigation measures, as appropriate.*
- Develop and implement a work plan to assess the nature and extent of 1,4-dioxane contamination in the groundwater. 1,4-dioxane has not been tested for and its extent and potential impact on the remedy is currently unknown. Additional data is needed to determine the nature and extent of contamination. In addition to 1,4-dioxane, groundwater samples will be analyzed for manganese.
- Continue to evaluate deep bedrock groundwater in the vicinity of increasing contaminant concentrations in well MW28DB and consider proposed modifications to the long-term monitoring program as needed.
- Institutional controls have been established at the site. Declaration of Restriction and Grant of Easements were recorded in the Town of Woodstock Land Records on January 3, 2005. While the State of Connecticut is not currently a grantee under the restrictions, it has agreed to accept the transfer of these restrictions in accordance with CERCLA Section 104(j). This action needs to be completed within an 18 month time period. In addition, although the deed restrictions prohibit excavation in certain areas of the Site, a review should be performed in this timeframe to determine whether the deed restrictions should also require that the cover installed over contaminated soils remain in place until soil and groundwater cleanup levels are attained.

**Protectiveness Statement(s):**

Based on the review and evaluation of data and information to date, EPA is deferring its determination of whether the remedy is protective of human health and the environment until an updated vapor intrusion study is completed and there is an investigation of 1,4-dioxane and manganese in the groundwater and residential supply wells. This determination will be made in September 2012.

## 1.0 INTRODUCTION

As requested by the United States Environmental Protection Agency (EPA), a Five-Year Review was conducted of the remedial actions selected for the Linemaster Switch Corporation (LSC) Superfund Site (the LSC Site), in Woodstock, Connecticut.

The purpose of the Five-Year Review is to determine whether the remedy being implemented at the LSC Site remains protective of human health and the environment. The methods, findings, and conclusions of the five-year review are documented in this Second Five-Year Review Report (this Report). In addition, this Report presents issues identified during the review and provides recommendations to address them.

The EPA, Region 1 prepared this five-year review pursuant to Agency policy and consistent with CERCLA §121 and the National Contingency Plan (NCP). CERCLA § 121 states:

*"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the LSC Site, the President shall review such remedial action no less than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that the action is appropriate at such site in accordance with section [104] or [106], the president shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews and any actions taken as a result of such reviews."*

The EPA interpreted this requirement further in the NCP; 40 CFR § 300.430 (f)(4)(ii) states:

*"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the LSC Site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action. "*

EPA conducted the five-year review of the remedial actions implemented at the LSC Site in Woodstock, Connecticut. Work on this review was undertaken between March 2009 and May 2009. The review was completed in accordance with EPA Guidance OWSER No. 9355.7-03B-P.

This is the second Five-Year review for the LSC Site. The triggering action for this statutory review is the completion of the First Five-Year Review in May 2004. The Five-Year review is

required because contaminants remain at the LSC Site above levels that allow for unlimited use and unrestricted exposure.

## 2.0 SITE CHRONOLOGY

The LSC Site chronology is summarized in Table 2-1.

**Table 2-1  
Chronology of Site Events  
Linemaster Switch Corporation Superfund Site  
Woodstock, Connecticut**

<b>Date</b>	<b>Event</b>
February 21, 1990	Linemaster Switch Corporation (LSC) Site is listed on the National Priorities List (NPL).
June 1992	Groundwater extraction and treatment system is installed to control contaminant migration off site.
December 1992	Remedial Investigation/Feasibility Study (RI/FS) completed.
July 21, 1993	EPA issued a Record of Decision (ROD) for the LSC Site.
1994	Consent Decree governing the remedial activities at the LSC Site is signed by LSC and EPA.
November 1998	Construction of the dual vapor extraction (DVE) remedial system is completed.
November 21, 2003	Due to lack of performance, the DVE system is re-evaluated in a Final DVE Optimization Report.
November 26, 2003	EPA authorizes LSC to deactivate the vacuum extraction portion of the DVE system.
May 24, 2004	EPA issues the first Five-Year Review Report for the LSC Site.
December 13, 2004	EPA approves the Explanation of Significant Differences (ESD) to the ROD, allowing the deactivation of the vacuum extraction system.
February 25, 2005	LSC submits a final reconfiguration proposal to the EPA.
March 29, 2005	EPA issued a Preliminary Construction Complete Report
April 11, 2005	EPA approves LSC's final reconfiguration proposal.
2004 to present	LSC, through its contractor, Woodward & Curran, Inc. (W&C) submits semi-annual Long-Term Monitoring Reports in the spring and fall of each year, which summarize the results of environmental and drinking water samples collected during the previous 6-month period.
November 20, 2007	W&C updates the Sampling and Analysis Plan for the LSC Site.
March 2009	Initiation of second five-year review.
July 2009	Completion of the Second Five-Year Review Report.

### **3.0 BACKGROUND**

The LSC Site is located east of Plaine Hill Road in Woodstock, Connecticut. The LSC Site is bounded on the north and east by Route 169, on the west by Plaine Hill Road and on the south by State Route 171. The LSC Site consists of 90 acres of land and is located on a hill. A map depicting the location of the LSC Site is presented as Figure 1 (Appendix A).

#### **3.1 Physical Characteristics**

LSC is an active manufacturing facility. The LSC Site includes woodlands, grass meadows, wetland areas, and several ponds and streams. The manufacturing facility is situated on a hill, with topography dropping off in all directions. Surface water streams in the vicinity of the LSC Site generally flow east or northeasterly into Roseland Lake, located about 0.75 miles east of the LSC Site, which then drains south into the Little River. Most of the properties surrounding the LSC Site are residential. Drinking water for LSC facility and surrounding properties is provided by individual overburden and bedrock groundwater wells. The primary direction of groundwater flow is to the east-northeast, following the natural hydraulic gradient two major fracture traces identified at the LSC Site. A map depicting the LSC Site features is presented Figure 2 (Appendix A).

#### **3.2 Land and Resource Use**

Prior to 1952, the LSC Site was used for residential purposes and small scale farming. Starting in 1952 LSC began manufacturing foot operated switches at the LSC Site. Currently, LSC manufactures electrical power switches, air valves, electrical cord sets and metal name plates at the LSC property. The LSC manufacturing facility is located near the center of the LSC Site, and on its topographic high point. In addition to the manufacturing facility, several residential parcels and a commercial parcel, on which a restaurant is located, are also located on the site.

The Site includes woodlands, grass meadows, wetland areas, and several ponds and streams. The Site is surrounded mainly by residential property, with most of the nearby residences located to the northeast, east and southeast. Linemaster as well as all other residential and commercial property located on and in the vicinity of the Site obtain their drinking water from individual bedrock and overburden wells.

A more complete description of the Site can be found in the "Remedial Investigation/Feasibility Study, Linemaster Switch Corporation, Woodstock, Connecticut, December 1992", in Section 1 of Volume I.

The potential for exposure to contaminated soil and groundwater has been addressed through institutional controls in the form of deed restrictions that were recorded on January 3, 2005.

### **3.3 History of Contamination**

As part of LSC's manufacturing operations, paint thinner, trichloroethylene (TCE), and other volatile organic compounds (VOCs) were used for spray painting and vapor degreasing operations. Approximately 20 to 200 gallons per year of TCE and other chemicals were discharged into an on-site drywell located in front of the east side of the LSC manufacturing building. The exact amount of TCE and other chemicals discharged to the drywell is unknown, but the discharge reportedly occurred from 1969 through 1979.

### **3.4 Initial Response**

In July 1980, the Connecticut Department of Environmental Protection (CTDEP) conducted a Site Inspection of the facility pursuant to the Resource Conservation and Recovery Act (RCRA) and, in July 1984 it conducted a Preliminary Assessment pursuant to the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA).

As a result of the 1980 and 1984 CTDEP investigations, EPA conducted Site Inspections at LSC in December 1985 and February 1986. During these inspections EPA sampled the on-site production well and the back-up production well, in addition to off-site drinking water supply wells. Results of sampling and analysis indicated the presence of VOCs in the production well, the back-up production well, and several off-site wells. VOCs, primarily TCE, were identified at concentrations exceeding state and federal drinking water standards. TCE was identified on Site at concentrations as high as 3,900 micrograms per liter ( $\mu\text{g/L}$ ). TCE was detected in three off-site water supply wells at 5,000  $\mu\text{g/L}$ , 11  $\mu\text{g/L}$ , and 2.4  $\mu\text{g/L}$ .

EPA conducted soil sampling in the area between the factory building and the paint storage shed. The results of this sampling were the basis for making a recommendation to conduct additional sampling to determine the extent of contamination.

On April 8, 1986, CTDEP issued an Abatement Order to LSC to investigate the extent of contamination at the LSC Site, and to take the actions necessary to minimize or eliminate any contamination. A Superfund Removal Action took place in mid-1986 to provide bottled water to affected users. In February 1987, in response to State demands, LSC began designing an interim removal treatment system (IRTS) to address groundwater contamination. This system would treat contaminated groundwater to drinking water standards using an air stripper and activated carbon. In September 1987, an Administrative Order by Consent (AOC) was signed between EPA and LSC that required LSC to perform a site investigation and well monitoring, in addition to providing alternate drinking water supplies, as needed. In June 1989, LSC removed the drywell. The LSC Site was added to the National Priorities List (NPL) in February 1990. Thereafter, EPA and LSC entered into a second AOC in September 1991, under which LSC agreed to perform a Remedial Investigation/Feasibility Study (RI/FS) at the LSC Site.

### **3.5 Basis for Taking Action**

The RI/FS for the LSC Site was completed in 1992. The RI/FS concluded that the disposal of TCE and other hazardous substances into the drywell had contaminated soil and on-site groundwater to levels that were above state and federal standards. Table 3-1 summarizes the list of contaminants at the LSC Site, and includes a list of cleanup levels included in the ROD. Moreover, so long as soil in the vicinity of the drywell continued to act as a source of groundwater contamination, EPA concluded that VOC concentrations in groundwater posed an unacceptable risk to human health and the environment given the present and potential future use of the Site groundwater as a drinking water supply.

The exposure pathways considered in the human health risk assessment (HHRA) performed during the RI, upon which the decisions in the ROD were based, included: (1) ingestion of groundwater; (2) ingestion of soil; and (3) inhalation of vapors during excavation of soil within the LSC Site.

**Table 3-1  
List of Site Contaminants  
Linemaster Switch Corporation Superfund Site  
Woodstock, Connecticut**

Media	Contaminant	ROD Clean-up Level (ppb) <sup>1</sup>	Pre-ROD Concentrations (ppb)	
			average	maximum
Soil	1,2-dichloroethane	4	N/A	N/A
	Dichloromethane	3	N/A	N/A
	Tetrachloroethylene (PCE)	10	80.1	2,800
	Trichloroethylene (TCE)	5	122.6	4,022
	Cis-1,2-dichloroethene (DCE)	50	47.2	938
	Toluene	1,000	274.5	7,577
	1,1,1-trichloroethane	300	9.1	11
	Xylenes	100	264.4	8,300
Groundwater	Acetone	3,700	2,129	50,000
	Arsenic	50	41.2	513
	Benzene	5	44.7	54
	Beryllium	4	9.7	87
	Cadmium	5	63.3	757
	Carbon tetrachloride	5	14	47.5
	Chloroform	100	17	58.7
	Chloromethane	6.5	11.8	120
	1,2-dichloroethane	5	7.8	70.9
	1,1-dichloroethene	7	109.5	813
	Cis-1,2-DCE	70	803.5	26,000
	Dichloromethane	5	236.6	1,810
	1,2-dichloropropane	5	169.9	420
	2-hexanone	1,500	766.3	2,100
	Methyl ethyl ketone	1,800	1,366.5	38,000
	PCE	5	132.1	1,800
	1,1,1-trichloroethane	200	103.1	1,700
	1,1,2-trichloroethane	5	23	71.9
	TCE	5	42,931.9	800,000
	Toluene	1,000	2,529.6	64,000
Vinyl chloride	2	10	20.3	

**Note:** ppb = parts per billion

<sup>1</sup> This chart does not include or reflect any standards promulgated since issuance of the ROD.

## 4.0 REMEDIAL ACTIONS

### 4.1 Remedy Selection

The remedial action objectives specified in the 1993 ROD included both source control measures and management of migration measures to mitigate existing and future threats to public health and the environment. These response objectives are:

#### Source Control

- Prevent or mitigate the continued release of hazardous substances to the groundwater and surface water by removing the opportunity for contact between precipitation and groundwater and the contaminated soils; and
- Reduce the concentrations of VOCs in soil within the Zone 1 area so that concentrations of VOCs in the groundwater will not exceed drinking water standards and will not pose a risk to human health and the environment.

#### Management of Migration Measures

- Eliminate or minimize the threat posed to human health and the environment by preventing exposure to groundwater contaminants;
- Prevent further migration of groundwater contamination beyond its current extent; and
- Restore contaminated groundwater to drinking water standards, and to a level that is protective of human health and the environment, as soon as practicable.

The selected remedy for the LSC Site was contained in the 1993 ROD and included both source control and management of migration (or groundwater control) components:

- In-situ vacuum extraction of contaminated soil to remove VOCs;
- Extraction of contaminated groundwater from the overburden and bedrock using extraction wells;

- Treatment of contaminated groundwater using air stripping with carbon emission controls;
- Environmental monitoring of soil, groundwater, surface water, and private residential wells;
- Institutional controls in the form of deed restrictions to prohibit the use of the groundwater until the cleanup levels are met; and
- Five-Year reviews

#### **4.2 Remedy Implementation**

In a Consent Decree, Linemaster agreed to perform the Remedial Action specified in the 1993 ROD.

In December 1994, LSC performed a pilot test to gather data that would be used to design the Dual Vapor Extraction (DVE) system. Based on the results of this test, LSC concluded that there were insufficient data on soil characteristics to develop a Conceptual RD, and that enhancements to the natural characteristics of overburden would be required to achieve adequate air and groundwater flow for the performance of the DVE system. To address these two issues, LSC performed a second pilot study in November 1995 to delineate the extent of soil contamination to be addressed by DVE, and evaluate whether or not the permeability of the overburden could be enhanced through hydraulic fracturing. Based on the results of this test, EPA concluded that hydraulic fracturing would enhance the permeability of the overburden and therefore, design of the DVE system could proceed. However, in recognition that the extremely low permeability of the overburden may limit the ability of this system to meet the cleanup levels specified in the ROD, EPA divided the design of the DVE into two phases (i.e., Phase 1A and 1B), with the implementation of the second phase being delayed until EPA, CTDEP and LSC had the opportunity to evaluate the performance of the DVE system on soil located within the vicinity of the former drywell.

During fall 1996, LSC installed a series of hydro-fractured wells in the former drywell area. Construction of the DVE system occurred between 1997 and 1998 and in April 1999, dewatering of the former drywell area commenced. All of these activities occurred prior to EPA approving the 100% RD on May 27, 1999 because it was determined that construction and operation of the DVE system within the former drywell area would serve as a pilot study for the use of this remedial approach on other areas targeted for DVE.

EPA, CTDEP, and LSC monitored the performance of the DVE system after it became operational in December 1998. In February 2001, LSC, with EPA and CTDEP oversight, developed and implemented a DVE Optimization Plan because monitoring of the DVE system had shown that the hydro-fractured wells had only dewatered 60% of the Phase 1A area, and the VOC removal rates of the vapor extraction component of the DVE system were steadily declining. The optimization plan included, among other things, testing of the dewatering wells, increasing the subsurface vacuum, and redevelopment of the fractured wells. These tasks were intended to improve both dewatering and VOC removal rates within soil. However, as presented in Woodard & Curran's (W&C's) November 2003 Final Dual Vapor Extraction System Optimization Report, none of the tasks performed as part of the optimization plan significantly improved the performance of the DVE system. Based on this report, EPA concluded that the low-permeability soil was preventing further dewatering and VOC removal within the Phase 1A area. Consequently, EPA determined that the vapor extraction component of the DVE system was no longer significantly contributing to the remediation of the LSC Site and that further remediation via vapor extraction should not be pursued. This determination resulted in EPA agreeing to a moratorium on the vapor extraction component of the DVE system in November 2003. The purpose of the moratorium was to allow EPA the opportunity to perform a formal review and evaluation of the DVE and IRTS systems to determine if the cleanup objectives presented in the 1993 ROD were still achievable. EPA completed its evaluation and determined that the remedy selected in the 1993 ROD needed to be modified.

In December 2004, EPA signed an Explanation of Significant Differences (ESD) to the ROD. The remedy was revised for this Site to discontinue operation of the vacuum extraction component of the DVE system while maintaining continued operation of the groundwater extraction and treatment component of the system. EPA did not change the cleanup objectives for the LSC Site, or any of the cleanup levels provided in the 1993 ROD. This modified remedy does not rely on vapor extraction for further remediation of soil. Rather, the soil cleanup levels presented in the ROD will be achieved through the flushing of contaminants via the continued operation of the groundwater extraction component of the DVE system. The vapor extraction component of the DVE system was permanently decommissioned in 2004.

### **4.3 Operation and Maintenance**

LSC has been conducting Operation and Maintenance (O&M) of the remediation system in accordance with the O&M Manual for Phase 1A Remediation. The primary activities associated with this O&M plan are weekly system inspections and sampling of the system's influent and effluent groundwater, and air sampling ports. Semi-annual groundwater sampling and analysis for the contaminants of concern is performed as well as on-site surface water monitoring and nearby residential domestic water supplies. This data is contained in long-term monitoring reports (LTM reports).

Institutional controls are monitored for compliance on an annual basis. Recorded deed restrictions prohibit specified activities at the Site, including:

- Groundwater may not be used for any purpose, except (a) where contaminants have been reduced through treatment and attain drinking water levels, with prior approval by EPA, (b) as required for the performance of the Remedial Action for the Site; or (c) as otherwise approved by EPA. There are also monthly volume limits on the volume of groundwater that Linemaster may pump from its production well.
- An area delineated as the Soil Restriction Area may be used solely for commercial or industrial activities.
- No excavation or construction is permitted within the Soil Restriction Area and/or the bedrock underlying the Linemaster property, unless approved by EPA.
- No excavation or construction activities that include dewatering or lowering the groundwater table shall be taken outside the Soil Restriction Area, unless approved by EPA.<sup>2</sup>

While the ROD indicated that institutional controls would include a fence around the source area, EPA determined during remedial construction that this measure was not required because

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<sup>2</sup> While the ROD for the Site required deed restrictions to prohibit the use of the groundwater, the restrictions as implemented contain detailed prohibitions, as summarized in part above.

the source area was already covered by a paved surface which currently remains intact. There is no direct contact exposure to soils.

Additional O&M activities occur on an as-needed basis.

The annual Operation and Maintenance costs are approximately \$300,000.

## **5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW**

This is the second Five-Year review for the LSC Site. The First Five-Year Review was completed in May 2004. The text of the May 2004 Protectiveness Statement is as follows:

"The remedy at the Linemaster Switch Superfund Site is currently protective of human health and the environment. Long-term protectiveness will be determined after EPA makes a final determination regarding the final status of the DVE system. In the interim, continued operation of the IRTS and groundwater monitoring will ensure that people are not exposed to unsafe levels of contaminants that may be present in the groundwater."

All issues identified in that review have been addressed. Significant activities completed since the last Five-Year review included:

- EPA completed an ESD to the ROD on December 13, 2004, which concluded that the Phase 1A DVE source control measure implemented under the ROD was not going to achieve soil cleanup standards in a cost-effective manner within the timeframe initially estimated. EPA revised the ROD-selected remedy for the source area by discontinuing the vacuum extraction portion of the DVE system, while continuing to operate the groundwater extraction and treatment portion of the DVE system. It was determined that the soil cleanup levels presented in the ROD will be achieved through the flushing of contaminants via the continued operation of the groundwater extraction component of the DVE system. The ROD-established soil and groundwater cleanup objectives remain in effect at the LSC Site and the modified remedy is expected to meet the ROD objectives within a reasonable period of time;
- LSC and W&C presented a final reconfiguration proposal for the Phase 1A system on February 25, 2005, with proposal modifications submitted on April 8, 2005. EPA

approved the proposal on April 11, 2005, which formalized the deactivation of the vacuum extraction portion of the DVE system;

- In March 2005, a Preliminary Close-Out Report documented that EPA had completed construction activities at the LSC Site in accordance with OSWER Directive 9320.2-09A-P, January 2000.
- EPA conducted a final inspection on October 5, 2004 and determined that the remedy is constructed in accordance with the remedial design and remedial action (RD/RA) plans and specifications. No further construction is anticipated.
- The groundwater monitoring program at the LSC Site was shifted one month forward, beginning with the semi-annual monitoring event performed in November 2004.
- W&C developed a Sampling and Analysis Plan (SAP) on November 20, 2007. The SAP formalized a variety of minor modifications that had been made since 2000.
- EPA has performed field oversight of the fall 2007 and spring 2008 semi-annual monitoring events. In addition, EPA has performed technical review of the Semi-Annual Monitoring Reports submitted between October 2007 and October 2008, as well as other technical reports submitted during that period.
- EPA received a March 10, 2008 request from the PRPs for approval under the Institutional Controls to increase the volume of water allowed to be extracted from Linemaster Facility Well GW08DB from 90,000 gallons of groundwater to 160,000 gallons. In 2004 Linemaster, with approval by EPA, recorded deed restrictions which limited groundwater use from GW08DB to a maximum of 90,000 gallons per month, unless otherwise approved by EPA. Due to an increase in production at the Linemaster facility, Linemaster wanted to increase its non-potable use of groundwater.

Following EPA and the CT DEPs review of Linemaster's March 2008 technical justification memo, it was agreed in 2008 that that the increased volume is not only acceptable, it will result in increased effectiveness of the remedial action (i.e., will increase pump and treat volume and further protect downgradient residential wells from

future migration of contaminated groundwater). This request was approved and the deed restrictions were updated in 2009 to allow for the increased water usage.

## **6.0 FIVE-YEAR REVIEW PROCESS**

This section provides a summary of the five-year review process and the actions taken by EPA to complete the review.

### **6.1 Administrative Components**

Leslie McVickar, EPA Project Manager led the LSC Site Five-Year review team, which included staff from Weston Solutions Inc, Mark Lewis of the CTDEP was also part of the review team.

The review team included the following components in review:

- Community Involvement
- Document Review
- Data Review
- Site Inspections
- Interviews
- Five-Year Review Report development and review

The Five Year Review was concluded in September 2009.

### **6.2 Community Involvement**

EPA sent out a public notification on May 8, 2009 announcing EPA's review of the LSC Site cleanup. The notification described the five-year review process and how the community could contribute during the review process.

### **6.3 Document Review**

The Five-Year review consisted of a review of relevant documents including O&M records and monitoring data. Applicable cleanup standards, as listed in the 1993 ROD were also reviewed. The documents reviewed are listed in Appendix B.

#### **6.4 Data Review**

As part of the review, the data collected by the LSC and W&C were evaluated to assess whether groundwater contaminants are being controlled by the groundwater collection system, and whether the soil and groundwater contaminant concentrations have achieved the ROD cleanup goals. A summary of the data review is provided below.

##### Soil Monitoring

There has been no monitoring of soil VOC concentrations in the source area since the shutdown of the vacuum extraction portion of the DVE system in 2003, before the first Five-Year Review. EPA believes that soil contamination concentrations continue to decrease through the flushing of contaminants via the continued operation of the groundwater extraction component of the treatment system. Unless new or changing Site conditions warrant, it is anticipated that soil samples will not be required until the compliance monitoring phase of the project to determine attainment of final cleanup levels for both soil and groundwater.

##### Groundwater Monitoring

Groundwater monitoring is used to assess whether the groundwater extraction system maintains control of the migration of contaminated groundwater from the LSC Site, and whether concentrations of detected constituents are increasing or decreasing. Monitoring wells have been installed to monitor three portions of the interconnected overburden-bedrock aquifer beneath the LSC Site: 32 completed in overburden, 16 completed in shallow bedrock, and 18 completed in deep bedrock. The 66 various monitoring wells are monitored on a monthly, semi-annual, or annual basis, for both groundwater elevation and chemical analysis for VOCs via EPA Method 8260B. In addition, 34 drinking water wells, primarily completed in deep bedrock, are monitored on a monthly, semi-annual, or annual basis, for chemical analysis for VOCs via EPA Method 524.2.

1. Groundwater Migration Control – Semi-annually, W&C plots groundwater elevations in the three portions of the interconnected overburden-bedrock aquifer, in order to demonstrate that the groundwater recovery system is controlling groundwater migration off-site from the source area. Copies of the most recent maps of these data, Figures 3-1 through 3-3, are attached to this Report. With certain exceptions (including certain data gaps), the groundwater data between 2004 and 2008 generally indicate that the migration of groundwater from the source area has been controlled, primarily by the

groundwater extraction from deep bedrock wells MW01DB, MW06DB, MW15DB, and MW17DB. Except in the vicinity of well MW11SB, the plume does not extent to parcel boundary. The exceptions include:

- Overburden groundwater flowing eastward from the source area appears to flow toward monitoring wells MW06T and MW18T without capture; however, groundwater analytical results from wells MW06T and MW18T indicate that contaminated groundwater is not present at these locations.
- Overburden groundwater flowing north from the source area appears to flow toward well MW27T and then beyond the LSC Site boundary without capture; however, groundwater analytical results from well MW27T indicate that contaminated groundwater is not present at well MW27T. These wells will be evaluated over time. Additional measures may be necessary.
- Deep bedrock groundwater appears to be captured by deep bedrock extraction well MW01DB, but there are no deep bedrock potentiometric data north of this well to confirm this condition. This well will be evaluated over time. Additional measures may be necessary.

2. Chemical Trends - Semi-annually, W&C plots groundwater concentrations of TCE in the three portions of the interconnected overburden-bedrock aquifer, in order to demonstrate that the groundwater recovery system is controlling off-site TCE migration in groundwater from the source area. Copies of the most recent maps of these data, Figures 3-4 through 3-6, are attached to this Report. With certain exceptions (including certain minor data gaps), the groundwater sample analytical results between 2004 and 2008 generally indicate that the migration of TCE in groundwater from the source area has been controlled, primarily by the groundwater extraction from deep bedrock wells MW01DB, MW06DB, MW15DB, and MW17DB, and that the system continues to reduce the concentration of groundwater contaminants. The exceptions include:

- Deep bedrock groundwater north of the source area in the vicinity of extraction well MW01DB contains TCE at a concentration of 9 µg/L; however, groundwater potentiometric elevation data in this area suggest that contaminated groundwater

may be captured by the well, although as noted above, there are no deep bedrock potentiometric data north of this well to confirm this condition.

- Deep bedrock groundwater southwest of the source area in the vicinity of monitoring well MW28DB contains TCE at a concentration of 107 µg/L and there are no deep bedrock potentiometric data southwest of this well to confirm TCE concentrations beyond this location. Although groundwater potentiometric elevation data in this area suggest that contaminated groundwater may be captured by extraction well MW17DB, the concentrations are sufficiently high to warrant further review.
- Shallow bedrock groundwater northeast of the source area in the vicinity of extraction well MW10SB has shown slightly increasing TCE concentrations since approximately December. The graph depicting the projection of the well MW10SB data is included as Figure C-1 in Appendix C.
- Shallow bedrock groundwater northeast of the source area in the vicinity of monitoring well MW11SB contained TCE at an estimated concentration of 1 µg/L and cis-1,2-DCE at 1.4 µg/L, and there are no other monitoring points located between this well and the Town Hall well (GW40DB); however, groundwater potentiometric elevation data in this area suggest that contaminated groundwater may be captured by extraction well MW01DB, and quarterly sampling of drinking water well GW04DB has not contained detectable TCE since September 2003.

Of the above-mentioned issued, further evaluation is needed of deep bedrock groundwater in the vicinity of MW28DB due to the levels of TCE detected in that well.

#### Surface Water Monitoring

The analytical data for surface water samples collected from the LSC Site and its vicinity have not contained detectable contaminants since the first Five-Year Review.

#### Air Monitoring

Two types of potential air monitoring issues were considered in this review – monitoring of VOC emissions from the air stripper component of the IRTS system, and monitoring of indoor air or

soil vapor to evaluate potential human health risks due to vapor intrusion from the groundwater plume.

The extraction rates and contaminant loading of groundwater treated by the air stripper over the 6-month period from January through June 2008 were used to calculate air stripper emissions and compare them to the emission limits cited in the air permit issued by the State of Connecticut in 1998. Based on our review, the air stripper emissions comply with the limits specified in the 1998 permit. Table C-1 in Appendix C provides a summary of the air emissions calculations.

There has been no monitoring of air or soil vapor VOC concentrations since the first Five-Year Review. EPA concluded that “volatilization of groundwater contaminants to indoor air spaces was not an issue” in the First Five-Year Review, despite direct measurement of soil vapor and groundwater contaminant concentrations exceeding CTDEP and EPA vapor intrusion screening levels in several unconsolidated deposit monitoring wells. A re-evaluation of this exposure pathway is needed to address EPA’s evolving understanding of this pathway (see Section 7.2 for a full discussion of this issue).

## **6.5 Site Inspection**

On April 8, 2009, EPA’s contractor conducted a site inspection, which included a Site walkover and an inspection of the groundwater extraction and treatment system. In addition, EPA’s contractor performed field oversight of LTM sampling activities on November 28, 2007 and May 25, 2008. A Site Inspection Checklist is included as Appendix D.

### **Monitoring/Extraction Well Network**

The monitoring well network is in excellent condition, with all wells marked and secured. The SAP for LTM activities at the LSC Site was revised in November 2007, to accommodate changes in technical guidance since its previous revision in 2000. Following the LTM field oversight, the following recommendations were made:

1. EPA recommended using bladder pumps instead of peristaltic pumps to collect groundwater samples from overburden monitoring wells; LSC/W&C responded by immediately changing the pump type used.

2. EPA recommended considering the use of passive diffusion bag samplers for the collection of groundwater samples rather than submersible pumps, recognizing that changing the groundwater sampling method may compromise the comparability of groundwater data for trend analysis; LSC/W&C responded that maintaining the comparability of groundwater data for trend analysis was a priority, and for that reason, the recommendation was considered but rejected.

### Groundwater Treatment System

The groundwater extraction and treatment system is well operated and maintained. Adequate spare parts are kept on-site to ensure minimal down time will result from common types of equipment failure. Influent groundwater from extraction wells and treated effluent sampling and analytical results included in the LTM reports confirm that the treatment system is performing within its required discharge limits. The following recommendation regarding the groundwater treatment system was made following the LSC Site Visit or during previous LTM field oversight activities:

During the May 2008 LTM oversight activity, it was noted that the sample ports on the groundwater extraction system manifold were constructed and accessed in such a way that a potential cross-contamination issue existed; LSC/W&C responded immediately by modifying the configuration and sampling procedures to avoid potential cross-contamination.

### **6.6 Interviews**

As part of the preparation of this five-year review, interviews were conducted with local town officials and persons with knowledge of the LSC Site. Refer to Appendix D for an Interview List of the individuals contacted.

Mr. Joseph Carlone, Chief Executive Officer of LSC and Mr. Kenneth Dery, a Vice President at LSC, were interviewed on April 8, 2009, to identify any current issues at the LSC Site. They each indicated that the LSC Site Remedial Action is operating as designed, that groundwater contaminant concentrations are generally decreasing, and that the remedial system it is being maintained in accordance with the O&M Plan. Mr. Carlone further indicated that LSC has spent approximately \$14 million to date on the cleanup, and that he did not anticipate any need to change the system, given that it was working according to plan. Mr. Dery further indicated that

the extraction rates appear to be on target with the estimates at the time of the First Five-Year Review, that the drinking water is safe, and that the groundwater plume is contained.

Mr. Steve Radcliffe, the Maintenance Manager at LSC, was also interviewed on April 8, 2009, to identify any current issues at the LSC Site. He indicated that LSC provides 24-hour monitoring of the treatment system, that any problems are immediately addressed, and that replacement parts are stored onsite to facilitate responsiveness. He further indicated that the longest system down time during the past 5 years, approximately 2 days, occurred following a lightning strike, when a controller panel (a replacement for which had not been on site) was damaged; a replacement is now stored on site. Mr. Radcliffe further indicated that LSC handles most of the mechanical maintenance, while W&C handles technical issues, and that the two firms work well together as a team.

Mr. Karl Kasper, a Vice President of W&C and Jack Markey, the Project Manager for W&C, LSC's operation and maintenance contractor, were interviewed on April 8, 2009, to identify any current issues at the LSC Site. Mr. Kasper and Mr. Markey commended LSC for being consistently proactive regarding O&M of the remedial systems at the LSC Site. They further indicated that the LSC Site is operating as designed, that groundwater contaminant concentrations are generally decreasing, and the remedial system is being maintained in accordance with the O&M Plan. Mr. Kasper and Mr. Markey recommended changing Site O&M reporting in the LTM Report from semi-annual to annual. Mr. Kasper further recognized that there may be a need to reassess the soil remedy, and that there may be an advantage to removing the cap from the soil source area. However, Mr. Kasper indicated that because LSC had already implemented a remedy for soil contamination, which had proven impractical, LSC should not be responsible for developing/implementing another soil remedy.

Mr. Markey referred to several proposed changes to Site O&M activities which have been included in recent LTM Reports, and for which, decisions have been deferred by EPA and CTDEP, which include the following:

- Reducing the frequency of LTM reporting from semi-annual to annual;
- Terminating sampling at the following wells or surface water sampling locations: MW13DB, MW07SB, MW08SB, GW43, GW51DB, SW03, and SW13 through SW17;

- Reducing sampling frequency from quarterly to semi-annual at the following wells: MW29DB, and MW17SB;
- Reducing sampling frequency from quarterly to annual at the following wells or surface water locations: MW21DB, GW20DB, GW57, SW04, SW07, and SW18;
- Reducing sampling frequency from semi-annual to annual at the following wells: MW17TS, GW06OB, and GW17DB.

EPA and the CTDEP will review these proposed changes in 2009.

Mr. Allan Walker, Jr., First Selectman of the Town of Woodstock, was interviewed on April 8, 2009. Mr. Walker was not aware of any issues at the LSC Site, and he indicated that to the best of his knowledge, the LSC Site is functioning as planned.

The Town of Woodstock Water Pollution Control Board was contacted on March 16, 2009. The Board Administrative Assistant, Ms. Tina Lajoie, indicated that as far as he knows, the LSC Site is in good condition and the remedy is functioning as intended. Ms. Lajoie reviewed the LSC Site files and indicated that there have been no complaints regarding the LSC Site.

The Town of Woodstock Emergency Management Director, Mr. Edward Munroe, Jr. was interviewed on April 8, 2009. Mr. Munroe indicated that, to the best of his knowledge, the LSC Site is in good condition and there have been no emergency calls regarding the LSC Site. Mr. Munroe indicated that the only known impact to the Town from the Remedial Action had occurred in the 1990s, when design plans for a sewer line located along Route 171 had to be modified to avoid blasting bedrock, and creating a potential pathway for contaminant migration.

Mr. Richard Baron, the regional Fire Marshall, was contacted on March 16, 2009. Mr. Baron indicated that, to the best of his knowledge, the LSC Site is in good condition and there have been no emergency calls regarding the LSC Site. Mr. Baron indicated that LSC had recently submitted an updated Tier II Report, pursuant to right-to-know laws.

Ms. Patricia Beckenhaupt, Director, and Ms. Maureen Marcoux, Sanitarian, of the Northeast District Department of Health, were contacted on March 16 and April 8, 2009, respectively. Neither Ms. Beckenhaupt nor Ms. Marcoux indicated that there have been any complaints or other issues regarding the LSC Site.

Ms. Leslie McVickar, Project Manager for the LSC Site for EPA, was interviewed on April 15, 2009. Ms. McVickar indicated that the project is going well, there are no impacts to the community, and that communication with LSC and W&C are good.

Mr. Mark Lewis, Remedial Project Manager at the Connecticut Department of Environmental Protection (CTDEP), Eastern District Remedial Program, was interviewed on April 15, 2009. Mr. Lewis indicated that his involvement with the LSC Site is minimal, but to the best of his knowledge, the LSC Site is in good condition and functioning as planned. Mr. Lewis further commented that LSC has been extremely responsive and cooperative regarding the LSC Site cleanup.

## **7.0 TECHNICAL ASSESSMENT**

This section provides a technical assessment of the remedies implemented at the Site, as outlined in the Comprehensive Five-Year Review Guidance (EPA, 2001b). The remedies have been evaluated based on their function in accordance with decision documents, their adherence to valid risk data and scenarios, as well as any other information that could have affected the remedy's protectiveness.

### **7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?**

Yes. The remedial action objectives specified in the 1993 ROD included both source control measures and management of migration measures to mitigate existing and future threats to public health and the environment. These response objectives are:

#### Source Control

- Prevent or mitigate the continued release of hazardous substances to the groundwater and surface water by removing the opportunity for contact between precipitation and groundwater and the contaminated soils; and
- Reduce the concentrations of VOCs in soil within the Zone 1 area so that concentrations of VOCs in the groundwater will not exceed drinking water standards and will not pose a risk to human health and the environment.

## Management of Migration Measures

- Eliminate or minimize the threat posed to human health and the environment by preventing exposure to groundwater contaminants;
- Prevent further migration of groundwater contamination beyond its current extent; and
- Restore contaminated groundwater to drinking water standards, and to a level that is protective of human health and the environment, as soon as practicable.

As discussed in the first Five-Year Review, a comparison of the remedial action objectives presented above to the current performance of the groundwater extraction portion of the DVE system demonstrates that the remedy has reduced the risks to human health and the environment. Pumping from the groundwater extraction wells has prevented further migration of groundwater contamination beyond the LSC Site, and in many parts of the LSC Site, the concentration of groundwater contaminants has been reduced to below state and federal drinking water standards. In addition, the potential for exposure to contaminated soil and groundwater has been addressed through institutional controls in the form of deed restrictions. One concern at the Site, however, is the increasing trend of TCE concentrations in monitoring well MW28DB, which may be outside the capture zone of the extraction wells. Concentrations of contaminants in this well remain relatively low (in the 100 µg/L to 200 µg/L range), but have demonstrated a steady increase since 2001. This well appears to be located on a groundwater divide and continued monitoring and evaluation will be necessary.

As outlined in the ESD to the ROD, the modified remedy is expected to have the same outcome as the original remedy presented in the ROD, however the length of time to attain the cleanup goals may increase. As part of the ESD, it was determined that these cleanup goals would still be obtained within a reasonable period time and in the most cost-effective manner.

### **7.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of the Remedy Selection Still Valid?**

No. A discussion of several relevant changes since issuance of the ROD is provided below.

a. Standards or TBCs Reviewed for Changes

The following applicable or relevant and appropriate requirements (ARARs) and "to be considered" (TBCs) have changed since the issuance of the ROD.

Safe Drinking Water Act (SDWA): MCLs and non-zero MCLGs are updated periodically. Among the contaminants of concern identified in the ROD, the MCL for arsenic has been reduced from 50 µg/L to 10 µg/L, as noted in the 2004 First Five Year Review. Sampling results from off-site residential drinking water wells as well as post-treatment water from the LSC production well, which is used for drinking water on-site, are non-detect for arsenic. At a future time, EPA will formally determine whether revisions to the MCLs since the issuance of the ROD are ARARs for the Site.

There is now a non-zero MCLG for chloroform of 70 ppb. The groundwater cleanup level for chloroform provided in the ROD is 100 ppb. As indicated above, at a future time, EPA will formally determine whether this non-zero MCLG, which was issued after the ROD, will be an ARAR for the Site.

Since issuance of the ROD, there have been no other changes to existing MCLs or non-zero MCLGs, or promulgation of new MCLs or MCLGs, for the contaminants of concern.

Groundwater quality on-site has not yet attained the interim groundwater cleanup levels for the Site or the more recently promulgated MCLs and non-zero MCLGs. Overburden and bedrock groundwater is sampled, analyzed, and evaluated under the LSC Site's LTM program. Results are reported in semi-annual LTM Reports. Final groundwater cleanup levels will be determined as part of the compliance monitoring for the Site.<sup>3</sup>

Off-site residential drinking water does not contain detectable concentrations of site-related contaminants and thus attains current federal drinking water standards. In addition, the post-treatment water from the LSC production well, which is used for drinking water on-site, does not

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<sup>3</sup> Future LTMP Report data tables should include interim cleanup levels, current MCLs and non-zero MCLGs, and CT RSRs to assist EPA and CT DEP in reviewing contaminant trends over time.

contain detectable concentrations of site-related contaminants and thus attains current federal drinking water standards.

Connecticut Remediation Standard Regulations (Section 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies):

The CTRSRs were promulgated in 1996 (after issuance of the ROD in 1993) and contain numeric and narrative standards for soil and groundwater remediation, and take into consideration factors that include land use, groundwater classification, and proximity to sensitive receptors. The Groundwater Protection Criteria (GWPC) of the CTRSRs identifies the numeric chemical concentrations to be considered for groundwater plume remediation in GA and GB aquifers. Groundwater clean-up goals for the LSC Site were established in the ROD prior to the promulgation of the CTRSRs. For several Site groundwater contaminants, the CTRSR GWPC is lower than the ROD clean-up goal.<sup>4</sup>

Overburden and bedrock groundwater is sampled, analyzed, and evaluated under the LSC Site's LTM program. Results are reported in semi-annual LTM reports. Groundwater quality has not yet attained the clean-up goals established in the ROD. CTRSRs should be considered in determining the protectiveness of the remedy during the compliance monitoring phase of the project.

Groundwater analytical results for nearby drinking water wells and post-treatment water from the LSC production well (which is used for drinking water on-site during the past five years) indicate that the concentrations of COCs meet state drinking water standards that are more stringent than the federal drinking water standard.

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<sup>4</sup> The groundwater classification at the Linemaster site is GA. The RSRs require that groundwater in areas with a groundwater classification of GA be restored to meet the background concentration for each substance in the plume. Given Linemaster's location at the top of a hill, it is very unlikely that another contaminant source exists upgradient. The background concentration for volatile organics is therefore likely equal to the detection limit. The groundwater protection criteria, rather than the background concentrations, may be used as remedial criteria in a GA area only if certain conditions are met. Those conditions are specified in section 22a-133k-3(d)(1) of the RSRs and will be evaluated in the future.

At a future time, EPA will formally determine whether any CT RSR GWPC that are more stringent than ROD cleanup levels should be ARARs for the Site. Currently there are no CTRSR soil standards for site COCs that are more stringent than EPA's soil cleanup goals.

With respect to vapor intrusion issues at the Site, further investigation is needed. EPA's protocol for evaluating vapor intrusion has evolved since the last Five-Year Review was conducted. As part of the planned investigation, EPA will consider the substantive requirements of the CTRSRs' Volatilization Criteria (VC). Following this investigation, and if necessary, EPA will determine whether the VC are ARARs for the Site.

The following table lists, among other things, all the COCs in comparison to CT RSRs.

**Table 7-1  
Comparison of Linemaster Switch Groundwater Cleanup Concentrations with EPA Vapor Intrusion Screening Levels and CT RSRs  
Linemaster Switch Corporation Superfund Site  
Woodstock, Connecticut**

Analyte	ROD Clean-up Level (µg/L)	MCL (µg/L)	EPA Draft VI Screening Level		CT RSR Groundwater Protection				Pre-ROD Groundwater Concentrations <sup>3</sup>		Highest Detected Concentrations		Highest Concentrations Detected in Residential Drinking Wells during 2008	EPA Regional Screening Levels Tapwater (ug/l)
			Residents (µg/L)	Workers <sup>2</sup> (µg/L)	GA & GAA Areas (µg/L) <sup>5</sup>	Surface Water (µg/L)	Volatilization Criteria <sup>6</sup>		Average (µg/L)	Maximum (µg/L)	Jul-Aug 08 (µg/L)	Nov-08 (µg/L)		
							Residential (µg/L)	Industrial (µg/L)						
Acetone	3,700	NP	220,000	1,386,000	700	NP	50,000	50,000	2,129	50,000	ND	ND	ND	22,000
Benzene	5	5	1.4 <sup>1</sup>	9	1	710	215	530	45	54	ND	ND	ND	0.41
Carbon tetrachloride	5	5	0.14 <sup>1</sup>	1	5	132	16	40	14	48	40	71	ND	0.2
Chloroform	100	NP	0.705 <sup>1</sup>	4	6	14,100	287	710	17	59	ND	ND	ND	0.19
Chloromethane	6.5	NP	6.7	42	NP	NP	NP	NP	12	120	ND	ND	ND	190
1,2-Dichloroethane	5	5	2.3 <sup>1</sup>	15	1	2,970	21	90	8	71	ND	ND	ND	0.15
1,1-Dichloroethene	7	7	190	1,197	7	96	1	6	110	813	8	47	ND	340
cis-1,2-Dichloroethene	70	70	2,100	13,230	70	NP	NP	NP	804	26,000	8,600	58,600	ND	370
Dichloromethane	5	5	58	365	5	48,000	50,000	50,000	237	1,810	ND	ND	ND	4.8
1,2-Dichloropropane	5	5	35	221	5	NP	14	60	170	420	ND	ND	ND	0.39
2-Hexanone	1,500	NP	NP	NP	NP	NP	NP	NP	766	2,100	ND	ND	ND	NP
Methyl ethyl ketone	1,800	NP	440,000	2,772,000	NP	NP	NP	NP	1,367	38,000	ND	ND	ND	22,000
Ethylbenzene	-	700	3.0 <sup>1</sup>	19	700	580,000	50,000	50,000	NP	NP	ND	ND	ND	1.5
Tetrachloroethene	5	5	0.6 <sup>1</sup>	3	5	88	1,500	3,820	132	1,800	14 J	195	ND	0.11
Toluene	1,000	1,000	1,500	9,450	1,000	4,000,000	23,500	50,000	2,530	64,000	5 U	3,370	ND	2,300
1,1,1-Trichloroethane	200	200	3,100	19,530	200	62,000	20,400	50,000	103	1,700	5 J	8.1 J	ND	9,100
1,1,2-Trichloroethane	5	5	4.1 <sup>1</sup>	26	5	1,260	8,000	19,600	23	72	ND	ND	ND	0.24
Trichloroethene	5	5	2.9 <sup>1</sup>	18	5	2,340	219	540	42,932	800,000	836,900	540,400	ND	1.7
Xylenes	-	10,000	22,000	138,600	530	NP	21,300	50,000	NP	NP	1 U	1,610 J	ND	200
Vinyl chloride	2	2	0.32 <sup>1</sup>	2	2	15,750	2	2	10	20	65 J	2,030	ND	0.016
Arsenic	50	10	NP	NP	50	4	NP	NP	41.2	513	ND	ND	ND	0.045
Beryllium	4	73	NP	NP	4	4	NP	NP	9.7	87	ND	ND	ND	4
Cadmium	5	5	NP	NP	5	6	NP	NP	63.3	757	ND	ND	ND	18

Notes:  
µg/L = Micrograms per liter (parts per billion).

NP = Not Provided

ND = Specified analyte not detected in sample

<sup>5</sup> See footnote 4 above on page 29

<sup>6</sup> See the CTDEP proposed revisions to the volatilization criteria at [http://www.ct.gov/dep/lib/dep/site\\_clean\\_up/remediation\\_regulations/RvVolCri.pdf](http://www.ct.gov/dep/lib/dep/site_clean_up/remediation_regulations/RvVolCri.pdf).

EPA RSL = EPA Regional Screening Level, April, 2009 [http://www.epa.gov/reg3hwmd/risk/human/rb-concentration\\_table/Generic\\_Tables/index.htm](http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm)

EPA VI = EPA Vapor Intrusion Screening Levels <http://www.epa.gov/osw/hazard/correctiveaction/eis/vapor/complete.pdf>

CT RSR = Connecticut Remediation Standard Regulation

MCL = Maximum contaminant levels in drinking water

Standards in Green are exceeded by one or more 2008 groundwater analytical results; results in Red exceed one or more standards.

ROD Cleanup levels are generally based on the MCL for each contaminant, with the following exceptions: Acetone, 2-Hexanone, and Methyl Ethyl Ketone cleanup levels were based on calculated hazard quotients; and the Chloromethane cleanup level was based on its cancer risk. <http://www.ct.gov/dep/lib/dep/regulations/22a/22a-133k-1through3.pdf>

<sup>1</sup> Risk-based VI screening levels (1E-06 cancer risk; HQ = 1) were calculated by EPA Region I for chemicals that had the MCL as the VI screening level.

<sup>2</sup> Screening level for workers is 6.3 times higher than for residents due to shorter exposure frequency (250 vs. 350 days/yr), shorter exposure duration (20 vs. 30 yrs), and shorter exposure time (8 vs. 24 hr/day)

<sup>3</sup> From Table 3-1 of 2009 Draft Five Year Review Report

Environmental Protection Agency To Be Considered Toxicity Values. EPA toxicity values, including reference doses (RfDs), cancer slope factors (CSFs), and health advisories, are routinely re-evaluated and updated. Currently, the primary source of toxicity values is the EPA's Integrated Risk Information System (IRIS) database. Carcinogen Assessment Group Potency Factors have been replaced with CSFs. Reference concentrations and inhalation unit risk factors are now available for evaluation of risks via the inhalation pathway. These toxicity values are used in the calculations of risk and the development of site-specific and more generic risk-based screening values or clean-up goals. The majority of groundwater clean-up goals for the LSC Site are based on MCLs and are not impacted by changes to toxicity values, except as MCLs are impacted themselves by changes to the toxicity values used to develop them. For groundwater contaminants without MCLs, Site-specific risk-based values were developed as clean-up goals. In 2004, EPA issued a health advisory due to health concerns from chronic exposure to high doses of manganese. Following this Five-Year review, groundwater and drinking water sampling will include manganese investigation.

Changes in toxicity values for these contaminants may impact the future protectiveness of these clean-up goals and will be re-evaluated during the compliance monitoring phase of the project. Compliance monitoring consists of a quantitative and qualitative review of all of the data to ensure that it meets all the final cleanup levels for groundwater at the Site.

Ambient Water Quality Criteria (AWQC): Federal water quality criteria continue to be available, but are now referred to as National Recommended Water Quality Criteria (NRWQC). National Recommended Water Quality Criteria are designed for the protection of human health and aquatic organisms and apply to surface water and drinking water. No VOCs have been detected in surface water samples collected as part of the LTM program. Groundwater monitoring results have not been compared to these criteria.

#### Changes in Exposure Pathways

There have been no changes in exposure pathways. However, as indicated above, further investigations is needed with respect to vapor intrusion. EPA's protocol for evaluating vapor intrusion has evolved since the last Five-Year Review was conducted. Additional evaluation of the vapor pathway is necessary.

#### Changes in Toxicity and Other Contaminant Characteristics

Since the time of the HHRA performed as part of the RI, EPA has re-examined and updated toxicity factors for most of the contaminants evaluated. Of particular note are the changes in toxicity values for TCE, the primary contaminant of concern for the LSC Site. Changes in these toxicity factors do not affect the remedy because of its reliance on MCLs. The MCL for TCE has not changed, despite recent changes to TCE toxicity values.

#### Changes in Risk Assessment Methods

Since the HHRA performed during the RI and the 1993 ROD, changes have occurred in the formulas and standard exposure assumptions used to calculate risks from exposures to soil and groundwater and the methods for evaluating the vapor intrusion pathway. However, changes in risk assessment methods do not affect the remedy because of its reliance on MCLs.

#### New Contaminants and/or Contaminant Sources

No new contaminants or contaminant sources have been identified since startup of the remedy. The contaminants detected at highest concentrations in groundwater samples are those identified in the ROD as contaminants of concern. No new contaminants of concern have been identified. No toxic byproducts of the remedy were identified during the review.

However, as discussed previously, 1,4-dioxane has not been tested for and its extent and potential impact on the remedy is currently unknown. Manganese should also be included in future sampling. Additional data is needed to determine the nature and extent of contamination for these constituents during the LTMP.

#### Expected Progress Toward Meeting RAOs

The groundwater extraction system has reduced the migration of contaminants in groundwater and reduced the extent of contamination. Groundwater analytical results from the past five years indicate that contaminant levels are generally decreasing asymptotically. Monitoring of domestic water supply wells surrounding the LSC Site confirm that groundwater contaminants are no longer impacting private wells off-site. Monitoring of the on-site production well confirms that contaminants of concern for groundwater are treated to meet safe drinking water standards (including current federal and state drinking water standards, and risk-based standards) prior to use. However, given the decision in the ESD to discontinue SVE to address contaminated soils,

a review should be performed as to whether the deed restriction in place at the Site should be amended to ensure that the existing cover over the contaminated soils is not disturbed until final cleanup levels are attained. As noted in Section 4.0, the source area had been paved by LSC prior to the Remedial Action at the Site and currently remains in good condition.

### **7.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?**

Yes. With the exception of minor data gaps, regular monitoring of nearby drinking water wells and surface water bodies have confirmed the protectiveness of the remedy for potential targets via these exposure pathways. However, recent changes in the evaluation methodology for indoor air contaminant migration result in data gaps that must be evaluated.

### **7.4 Technical Assessment Summary**

According to the data reviewed, the LSC Site Inspection, and interviews with persons knowledgeable of the LSC Site, the remedy is currently functioning as intended by the ROD. Even though the vacuum extraction portion of the DVE system is no longer operating, EPA's evaluation in the ESD concluded that contaminants in soil will eventually leach out into groundwater and be treated via the pump and treat system within a timeframe consistent with the ROD projection. While there have been changes to the ARARs cited in the ROD, groundwater migration control has reduced concentrations of VOCs in nearby drinking water wells, mitigating the risk formerly posed by ingestion of groundwater contaminants by nearby residents. Although the remedy has significantly reduced the concentrations of the COCs and has mitigated the migration of contaminated groundwater beyond the LSC property line, available data indicates that groundwater concentrations on the LSC property remain above the interim groundwater cleanup goals, and may remain so in some areas beyond the timeframe estimated in the 2004 ESD to the ROD.

Finally, changes in vapor intrusion evaluation require an investigation of potential exposure to VOCs via inhalation. While no data is currently available to indicate that there is a current risk to human health, new information could affect the future protectiveness of the remedy. Additionally, 1,4-dioxane and manganese sampling and analysis data need to be collected and evaluated to determine protectiveness.

## 8.0 ISSUES

Based on the activities conducted during this Five-Year Review, the issues identified in Table 8-1 have been identified.

**Table 8-1  
Issues  
Linemaster Switch Corporation Superfund Site  
Woodstock, Connecticut**

Issues	Affects Current Protectiveness	Affects Future Protectiveness
Increasing VOC concentration trends in downgradient groundwater well, MW28DB.	No	Yes
The vapor intrusion exposure pathway at the Site has not been evaluated.	Yes	Yes
The interim groundwater cleanup goals for the LSC Site contaminants are not included in the data tables which accompany the LTM Reports.	No	No
The interim soil and groundwater cleanup goals do not account for CTRSRs (including CTRSR groundwater VCs, where applicable) promulgated following the ROD. These standards should be considered throughout the LTMP.	No	No
1,4-dioxane is a contaminant that has not been sampled for. In addition to 1,4-dioxane, groundwater and drinking water samples will be analyzed for manganese.	Yes	Yes
Institutional controls have been established at the Site. Declaration of Restriction and Grant of Easements were recorded in the Town of Woodstock Land Records on January 3, 2005. The State of Connecticut has agreed to be the grantee and accept the transfer of these restrictions.	No	No
Institutional controls should be reviewed to determine whether the deed restrictions should also require that the cover installed over contaminated soils remain in place until soil and groundwater cleanup levels are attained.	No	Yes

## 9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

In response to the issues noted above, Table 9-1 lists the recommended actions to be taken.

**Table 9-1  
Recommendations and Follow-up Actions  
Linemaster Switch Corporation Superfund Site  
Woodstock, Connecticut**

Issue	Recommendation and Follow-up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Indoor air pathway data gaps. There are vapor intrusion exposure pathway data gaps.	Evaluate potential risks of the vapor intrusion exposure pathway.	PRP (LSC)	EPA & CTDEP	April 2011	Yes	Yes
Increasing VOC concentration trends in the vicinity of downgradient groundwater well, MW28DB.	Continue to evaluate groundwater monitoring data in this area to evaluate trends. Additional monitoring wells may be necessary if warranted based on the data	PRP (LSC)	EPA & CTDEP	Semi-annually	No	Yes
1,4-dioxane has not been tested for and its extent and potential impact on the remedy is currently unknown. In addition, Manganese is a contaminant that needs to be sampled for in the groundwater and at the tap water on-site and off-site. Additional data is needed to determine the nature and extent of contamination.	Develop and implement a work plan to address 1,4-dioxane and manganese.	PRP(LSC)	EPA & CTDEP	October 2010	Yes	Yes
Interim soil and groundwater cleanup goals do not account for CTRSRs and revised MCLs.	Add a column to the LTMP reports to include CTRSRs. Prior to compliance monitoring, EPA will determine whether CTRSRs and revised MCLs should be ARARs for the Site.	PRP (LSC)	EPA & CTDEP	October 2010	No	No
Institutional controls have been established at the Site. Declaration of Restriction and Grant of Easements were recorded in the Town of Woodstock Land Records on January 3, 2005. The State of Connecticut has agreed to be the grantee and accept the transfer of these restrictions.	Transfer restrictions from the EPA to the State of Connecticut in accordance with CERCLA Section 104(j).	EPA	EPA & CTDEP	April 2011	No	No

Issue	Recommendation and Follow-up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Institutional controls have not been reviewed to determine whether the deed restrictions should also require that the cover installed over contaminated soils remain in place until soil and groundwater cleanup levels are attained.	Evaluate the adequacy of the institutional controls to determine whether the cover over the contaminated soils will remain in place until soil and groundwater cleanup levels are attained.	PRP (LSC)	EPA & CT DEP	April 2011	No	Yes

## **10.0 PROTECTIVENESS STATEMENT(S)**

Based on the review and evaluation of data and information to date, EPA is deferring its determination of whether the remedy is currently protective of human health and the environment until the updated vapor intrusion study is completed and there is an investigation of 1,4-dioxane and manganese in the groundwater and residential supply wells. This determination will be made in September 2012. There are currently institutional controls in place to prohibit use of currently known contaminated soil and groundwater.

## **11.0 NEXT REVIEW**

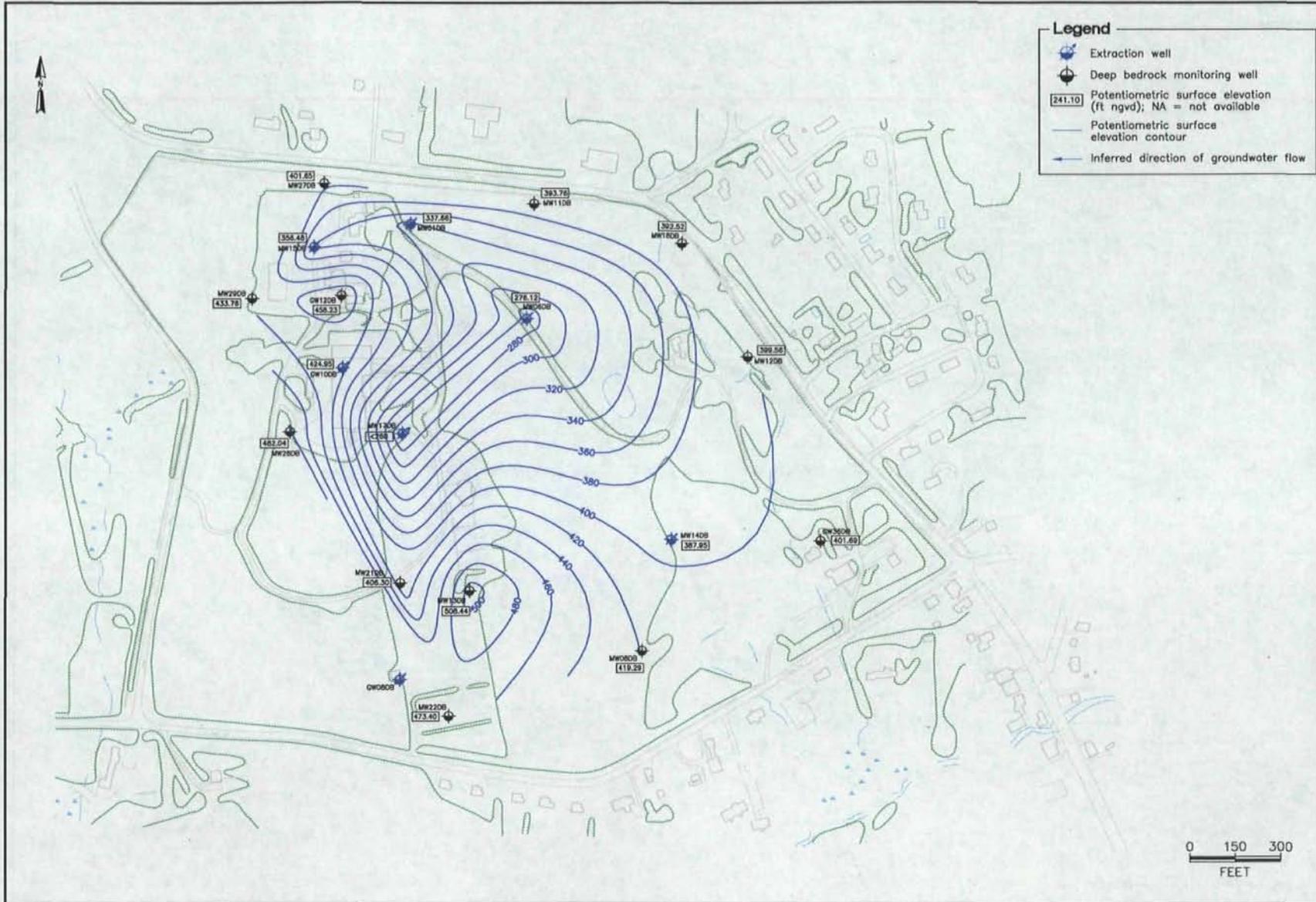
The next five-year review will be conducted by July 2014.

## **APPENDIX A**

### **FIGURES**







**DEEP BEDROCK  
POTENTIOMETRIC SURFACE  
CONTOUR MAP - MAY 2008**

DESIGNED BY: JM DRAWN BY: LT	CHECKED BY: JM Fig 3-1 - Oct08 (for dbrnet0808)
---------------------------------	--

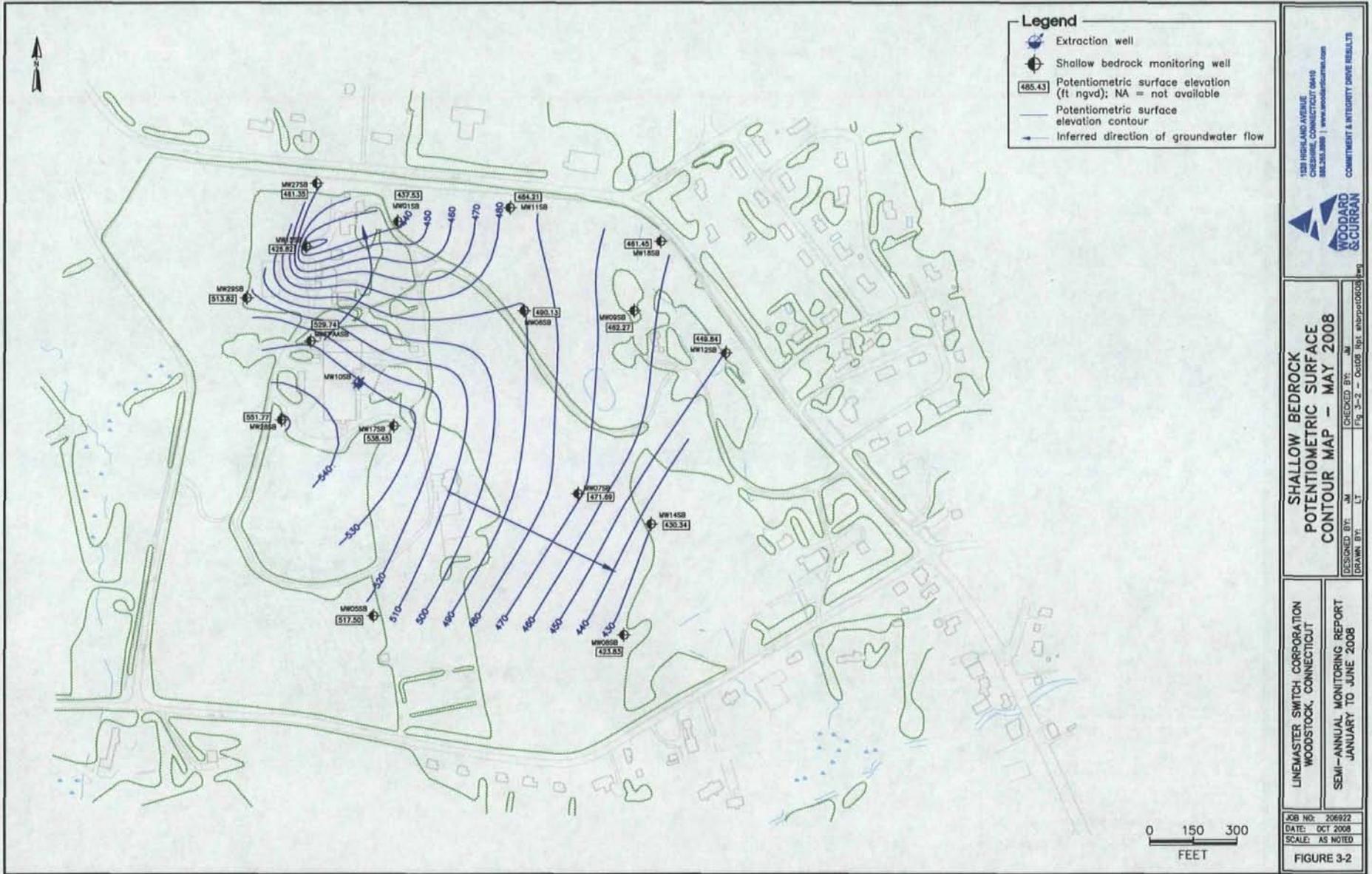
LINEMASTER SWITCH CORPORATION  
 WOODSTOCK, CONNECTICUT  
 SEMI-ANNUAL MONITORING REPORT  
 JANUARY TO JUNE 2008

JOB NO.: 206922  
 DATE: OCT 2008  
 SCALE: AS NOTED

**FIGURE 3-1**



1525 HIGHLAND AVENUE  
CHESHIRE, CONNECTICUT 06810  
860.368.8888 | www.woodwardclay.com  
COMMITMENT & INTEGRITY DRIVE RESULTS



100 HIGGS AVE SUITE 200  
 WOODSTOCK, CT 06097  
 860.263.8888 | www.linemaster.com



COMMITMENT & INTEGRITY DRIVE RESULTS

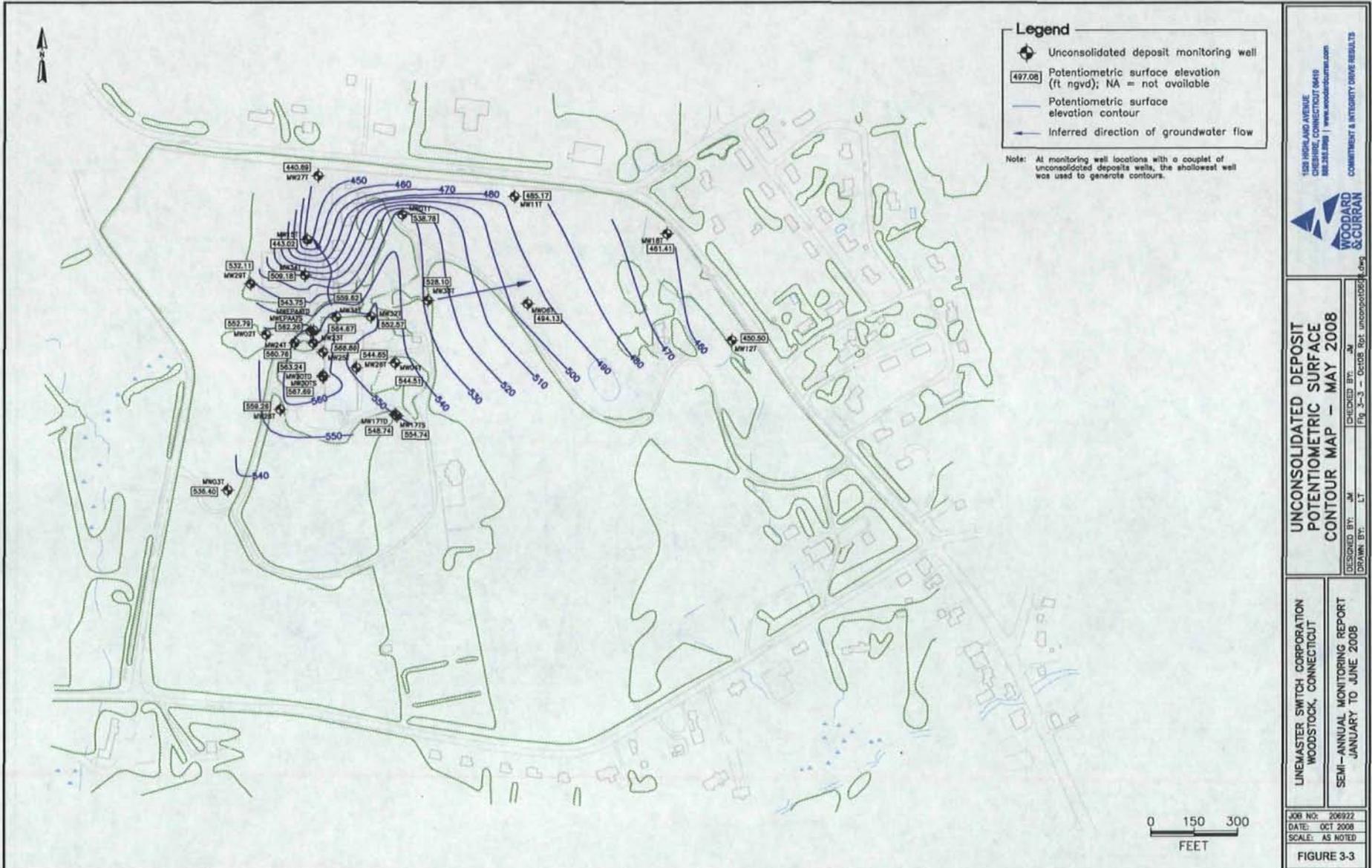
**SHALLOW BEDROCK  
 POTENTIOMETRIC SURFACE  
 CONTOUR MAP - MAY 2008**

DESIGNED BY: JN LT  
 CHECKED BY: JM  
 Fig. 3-2 - October 2008

LINEMASTER SWITCH CORPORATION  
 WOODSTOCK, CONNECTICUT  
 SEMI-ANNUAL MONITORING REPORT  
 JANUARY TO JUNE 2008

JOB NO: 206922  
 DATE: OCT 2008  
 SCALE: AS NOTED

FIGURE 3-2



- Legend**
- Unconsolidated deposit monitoring well
  - Potentiometric surface elevation (ft ngvd); NA = not available
  - Potentiometric surface elevation contour
  - Inferred direction of groundwater flow

Note: At monitoring well locations with a couplet of unconsolidated deposits wells, the shallowest well was used to generate contours.

150 NICHOLS AVE SUITE  
CHESTER, CONNECTICUT 06430  
TEL: 203.398.8900 | www.woodwardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

---

**UNCONSOLIDATED DEPOSIT  
POTENTIOMETRIC SURFACE  
CONTOUR MAP - MAY 2008**

DESIGNED BY: JM  
DRAWN BY: LT  
CHECKED BY: JM  
Fig. 3-3 - Oct108 Pot. unconsolidated.dwg

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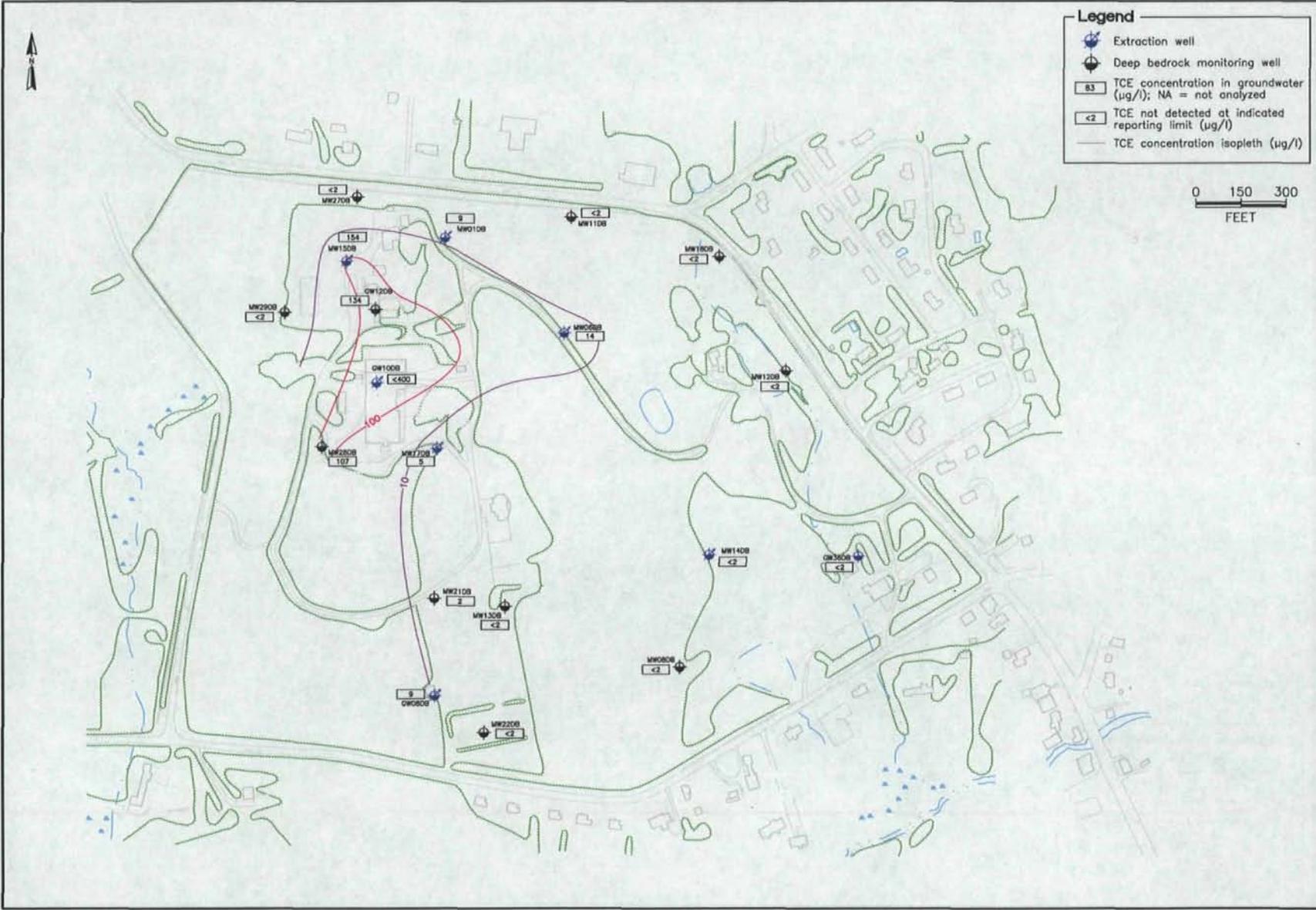
LINEMASTER SWITCH CORPORATION  
WOODSTOCK, CONNECTICUT

SEMI-ANNUAL MONITORING REPORT  
JANUARY TO JUNE 2008

---

JOB NO: 206922  
DATE: OCT 2008  
SCALE: AS NOTED

**FIGURE 3-3**



100 HIGHLAND AVENUE  
CHESHIRE, CONNECTICUT 06816  
860.265.3968 | www.woodwardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

**WOODWARD & CURRAN**

**DEEP BEDROCK TCE ISOPLETH MAP  
MAY/JUNE 2008**

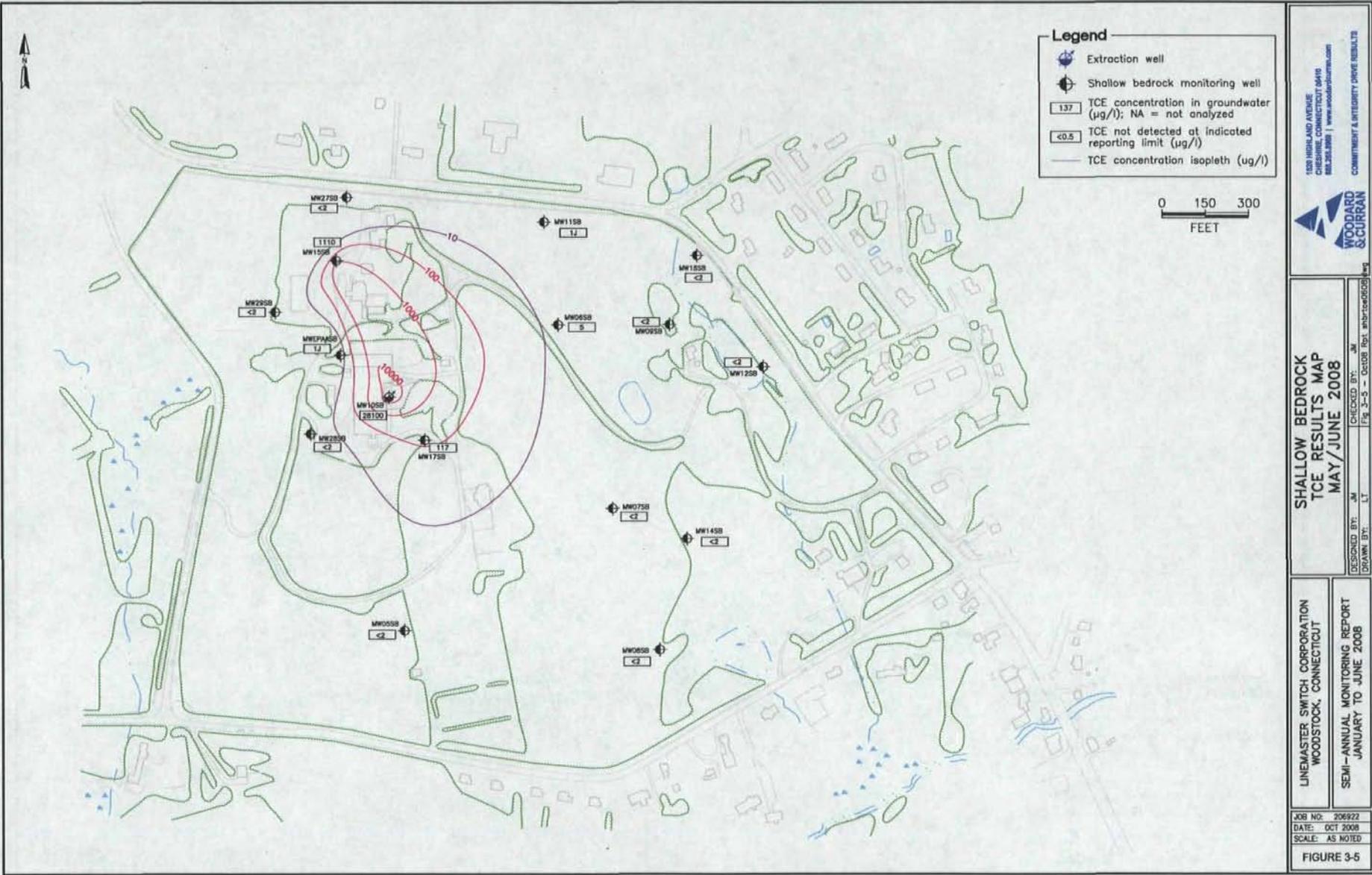
DESIGNED BY: JM LT  
CHECKED BY: JM LT  
DRAWN BY: JM LT  
Fig. 3-4 - October 2008 Report

LINEMASTER SWITCH CORPORATION  
WOODSTOCK, CONNECTICUT

SCM-ANNUAL MONITORING REPORT  
JANUARY TO JUNE 2008

JOB NO: 206922  
DATE: OCT 2008  
SCALE: AS NOTED

FIGURE 3-4



1500 HIGHLAND AVENUE  
CHESHIRE, CONNECTICUT 06410  
860.538.5888 | www.woodwardcurran.com



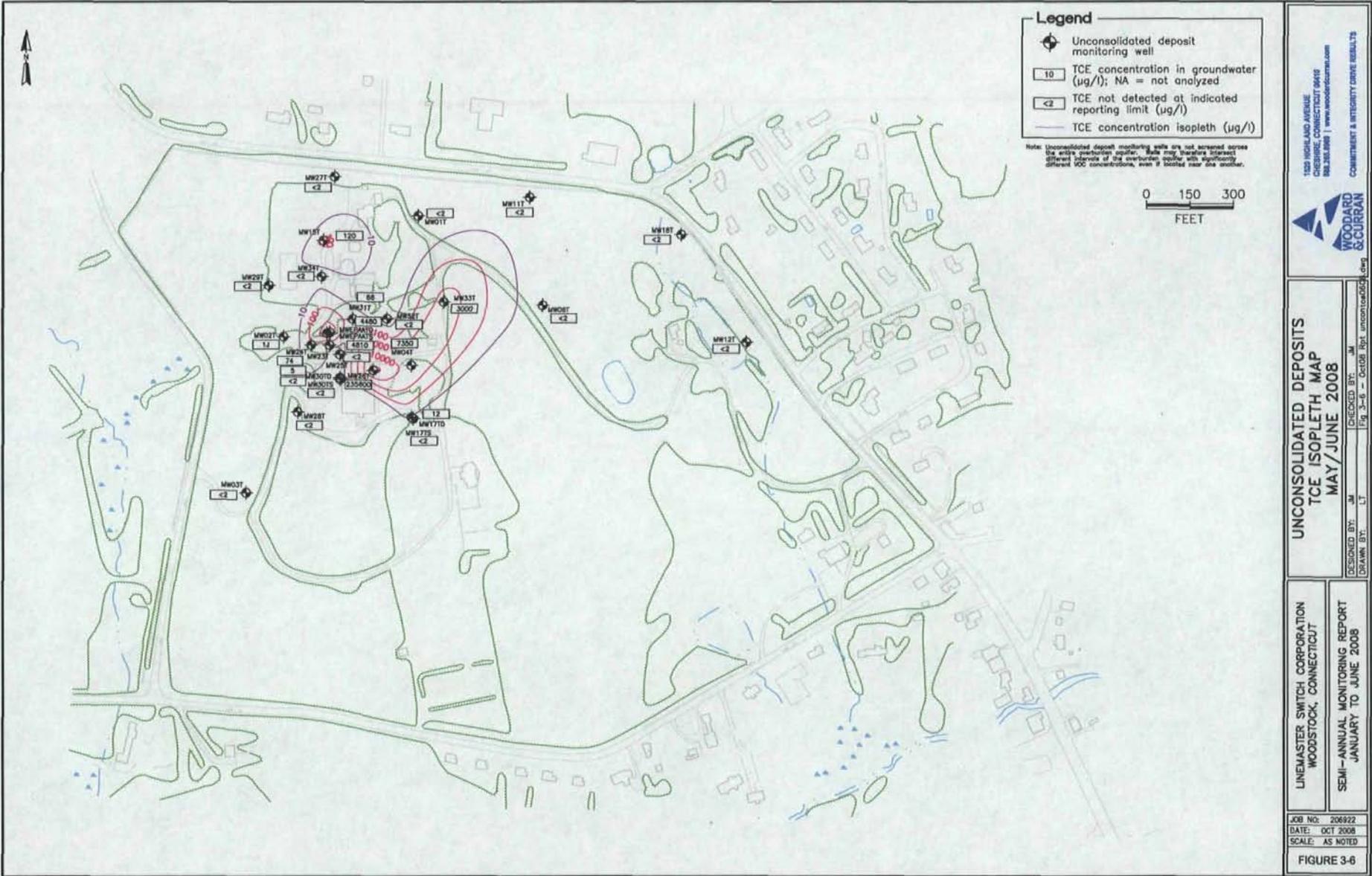
COMMITMENT & INTEGRITY DRIVE RESULTS

**SHALLOW BEDROCK  
TCE RESULTS MAP  
MAY/JUNE 2008**

DESIGNED BY: JM  
DRAWN BY: LT  
CHECKED BY: JM  
Fig. 3-5 - October 2008 (op. anbr-tce0608) (mg)

LINEMASTER SWITCH CORPORATION  
WOODSTOCK, CONNECTICUT  
SEMI-ANNUAL MONITORING REPORT  
JANUARY TO JUNE 2008

JOB NO: 206922  
DATE: OCT 2008  
SCALE: AS NOTED  
**FIGURE 3-5**



**Legend**

- ◆ Unconsolidated deposit monitoring well
- 10 TCE concentration in groundwater (µg/l); NA = not analyzed
- <2 TCE not detected at indicated reporting limit (µg/l)
- TCE concentration isopleth (µg/l)

Note: Unconsolidated deposit monitoring wells are not screened across the entire production aquifer. Wells may therefore intersect different layers of the production aquifer with significantly different VOC concentrations, even if located near one another.

0 150 300  
FEET

 WOODWARD & CURRAN <small>1000 HIGHLAND AVENUE CHESHIRE, CONNECTICUT 06815 860.265.8888   www.woodwardcurran.com</small> COMMITMENT & INTEGRITY DRIVE RESULTS	
<b>UNCONSOLIDATED DEPOSITS TCE ISOPLETH MAP MAY/JUNE 2008</b>	
DESIGNED BY: JM DRAWN BY: LT	CHECKED BY: JM <small>Fig. 3-6 - Oct08 rpt. unconsolidated</small>
LINEMASTER SWITCH CORPORATION WOODSTOCK, CONNECTICUT SEMI-ANNUAL MONITORING REPORT JANUARY TO JUNE 2008	
<small>JOB NO: 206922 DATE: OCT 2008 SCALE: AS NOTED</small>	
<b>FIGURE 3-6</b>	

**DOCUMENTS REVIEWED/REFERENCES CITED**

**APPENDIX B**

**DOCUMENT REVIEW LIST/REFERENCES**

## DOCUMENTS REVIEWED/REFERENCES CITED

- Fuss & O'Neill, Inc. (F&O), 1992. *Draft Remedial Investigation/Feasibility Study Feasibility Study Report, Linemaster Switch Corporation*. Volumes I through V. August.
- F&O, 1996. *Soil Fracturing Pilot Test Results, Linemaster Switch Corporation*.
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- W&C, 2007. *Semi-Annual Monitoring Report for July to December 2006, Linemaster Switch Corporation*. 30 April.

## DOCUMENTS REVIEWED/REFERENCES CITED

W&C, 2007. *Semi-Annual Monitoring Report for January to June 2007, Linemaster Switch Corporation*. 31 October.

W&C, 2008. *Semi-Annual Monitoring Report for July to December 2007, Linemaster Switch Corporation*. 30 April.

W&C, 2008. *Semi-Annual Monitoring Report for January to June 2008, Linemaster Switch Corporation*. 31 October.

W&C, 2008. *Proposed Increase of Institutional Control for Facility Well GW08DB, Linemaster Switch Corporation*. 10 March.

**APPENDIX C**

**FIVE-YEAR REVIEW AIR EMISSIONS CALCULATIONS**

**Table C-1**  
**Linemaster IRTS Air Stripper Emissions & Permit Limits**

Month	Days/Mo	Flow (gpm)	TCE (lbs/mo)	TCE (lbs/hr)	VOCs (lbs/mo)	VOCs (lbs/hr)
Jan-08	31		35	4.293	15.311	0.02058
Feb-08	28		33	2.853	10.563	0.01572
Mar-08	31		37	4.446	13.556	0.01822
Apr-08	30		30	5.576	14.157	0.01966
May-08	31		32	2.648	9.447	0.01270
Jun-08	30		37	4.538	11.617	0.01613
6 Month Average			34			0.01717

1998 CT DEP Air Permit Emission Limits and Actual Emissions:

VOCs 1.110 lb/hr

Average lbs/hr over 6 month period =

0.01717

MASC for TCE (ug/m<sup>3</sup>) =

756540

ASC(ug/m<sup>3</sup>) = C\* 2.00\*10E5,

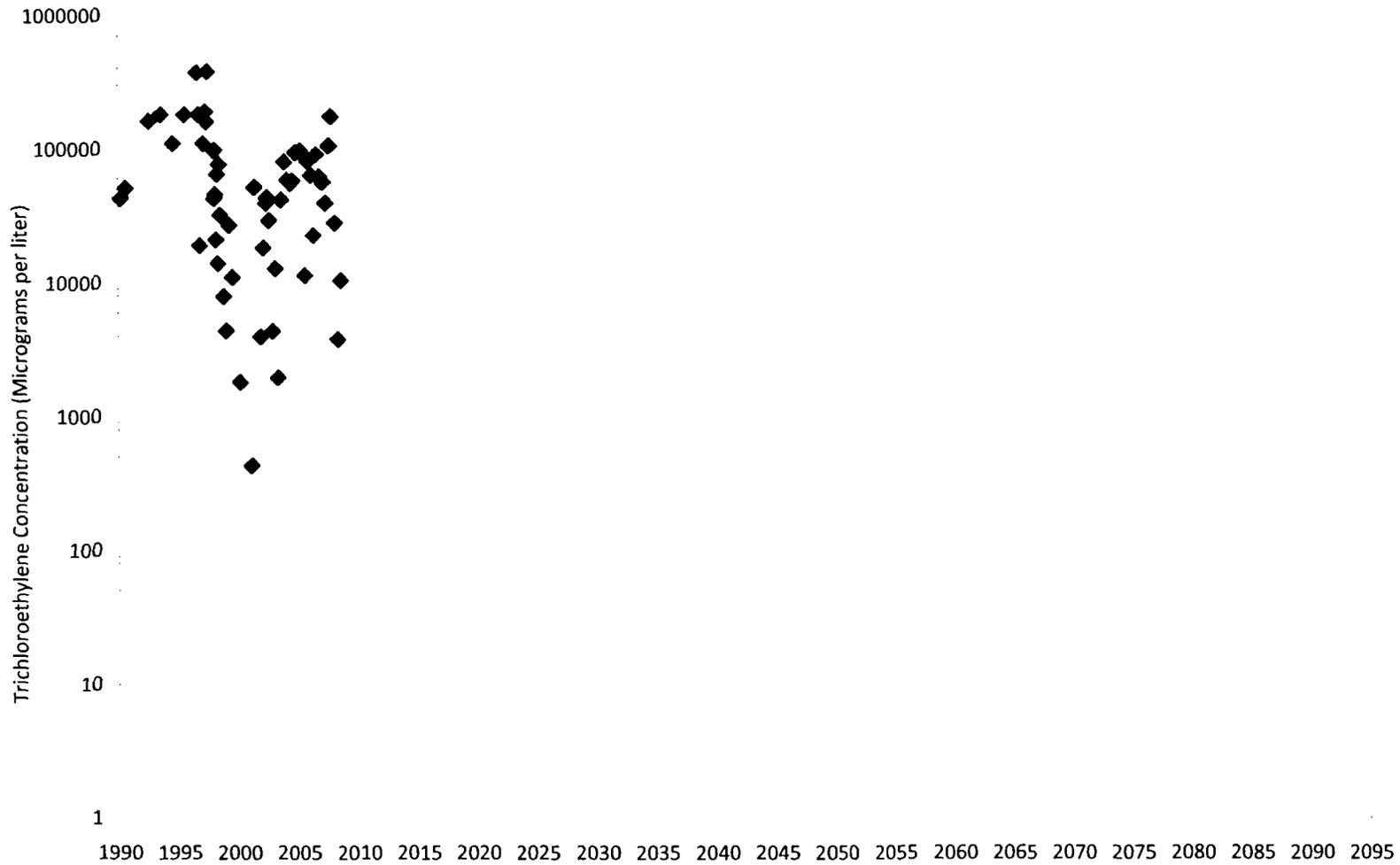
Where C = average lbs/hr

ASC for TCE (ug/m<sup>3</sup>) =

11199

Data obtained from Semi-Annual Monitoring Report January to June 2008 (Woodard & Curran, 2008)

Figure C-1 MW10SB TCE Concentration vs. Time



**APPENDIX D**

**SITE INSPECTION CHECKLIST AND INTERVIEW RECORDS**





III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input checked="" type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input checked="" type="checkbox"/> Air <input checked="" type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

**IV. O&M COSTS**

**1. O&M Organization**

- State in-house                       Contractor for State  
 PRP in-house                       Contractor for PRP  
 Federal Facility in-house         Contractor for Federal Facility  
 Other \_\_\_\_\_

**2. O&M Cost Records**

- Readily available         Up to date  
 Funding mechanism/agreement in place  
Original O&M cost estimate \_\_\_\_\_  Breakdown attached

Total annual cost by year for review period if available

From <u>2007</u>	To <u>2008</u>	<u>\$1.5 million</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	

**3. Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**V. ACCESS AND INSTITUTIONAL CONTROLS**     Applicable     N/A

**A. Fencing**

- 1. Fencing damaged**         Location shown on site map     Gates secured         N/A  
Remarks: \_\_\_\_\_

**B. Other Access Restrictions**

- 1. Signs and other security measures**         Location shown on site map     N/A  
Remarks: \_\_\_\_\_

**C. Institutional Controls (ICs)**

1. **Implementation and enforcement**  
Site conditions imply ICs not properly implemented  Yes  No  N/A  
Site conditions imply ICs not being fully enforced  Yes  No  N/A

Type of monitoring (e.g., self-reporting, drive by) \_\_\_\_\_  
Frequency \_\_\_\_\_  
Responsible party/agency \_\_\_\_\_  
Contact \_\_\_\_\_

Name	Title	Date	Phone no.

Reporting is up-to-date  Yes  No  N/A  
Reports are verified by the lead agency  Yes  No  N/A

Specific requirements in deed or decision documents have been met  Yes  No  N/A  
Violations have been reported  Yes  No  N/A  
Other problems or suggestions:  Report attached  
Remarks *Institutional controls for the Site are included in the Record of Decision (ROD), and have been implemented.*

2. **Adequacy**  ICs are adequate  ICs are inadequate  
Remarks \_\_\_\_\_

**D. General**

1. **Vandalism/trespassing**  Location shown on site map  No vandalism evident  
Remarks \_\_\_\_\_

2. **Land use changes on site**  N/A  
Remarks \_\_\_\_\_

3. **Land use changes off site**  N/A  
Remarks \_\_\_\_\_

**VI. GENERAL SITE CONDITIONS**

**A. Roads**  Applicable  N/A

1. **Roads damaged**  Location shown on site map  Roads adequate  N/A  
Remarks \_\_\_\_\_

**B. Other Site Conditions**

Remarks \_\_\_\_\_

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b>		<input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b>	<input checked="" type="checkbox"/> Good condition <input type="checkbox"/> All wells properly operating <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A	Remarks _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and other Appurtenances</b>	<input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	Remarks _____ _____
3.	<b>Spare Parts and Equipment</b>	<input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> All wells properly operating <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A	Remarks _____ _____
<b>B. Groundwater Extraction Wells, Pumps, and Pipelines</b>		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b>	<input type="checkbox"/> Good condition <input type="checkbox"/> All wells properly operating <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A	Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and other Appurtenances</b>	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	Remarks _____ _____
3.	<b>Spare Parts and Equipment</b>	<input type="checkbox"/> Good condition <input type="checkbox"/> All wells properly operating <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A	Remarks _____ _____

<b>C. Treatment System</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply) <input type="checkbox"/> Metals removal <input checked="" type="checkbox"/> Air stripping <input type="checkbox"/> Filters <input type="checkbox"/> Additive ( <i>e.g.</i> , chelation agent, flocculent) <input type="checkbox"/> Others <input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input checked="" type="checkbox"/> Equipment properly identified <input checked="" type="checkbox"/> Quantity of groundwater treated annually <u>18 million</u> <input type="checkbox"/> Quantity of surface water treated annually <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Bioremediation Remarks _____		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____		
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Chemicals and equipment properly stored <input type="checkbox"/> Needs repair Remarks _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> All required wells located <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> Routinely sampled <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition Remarks _____		
<b>D. Monitoring Data</b>			
1.	<b>Monitoring Data</b> <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality		
2.	<b>Monitoring data suggests:</b> <input checked="" type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining Remarks _____		



**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

*There is currently no active remediation of the soil source area at the LSC Site, which threatens to extend the timeframe required for achievement of interim soil and groundwater remedial goals.*

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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

*LSC has proposed several LTM modifications for the LSC Site, which are under consideration by EPA and CTDEP, including annual, rather than semi-annual reporting, and reduction/termination of monitoring at selected locations.*

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<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 09:10 <b>Date:</b> 15 April 2009
<b>Type:</b> <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b>		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Leslie McVickar	<b>Title:</b> TOPO	<b>Organization:</b> EPA, Region 1
<b>Telephone No:</b> 617/918-1374	<b>Street Address:</b> One Congress Street	
<b>Telecopy No:</b>	Suite 1100	
<b>E-Mail Address:</b> Mcvickar.Leslie@epamail.epa.gov	<b>City, State, Zip:</b> Boston, MA 02114-2023	
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression of the project? (general sentiment) <i>The project has been going well for a number of years.</i></li> <li>2. What effects have site operations had on the surrounding community? <i>There have been no impacts to the community, with the exception of the sampling of nearby drinking water wells.</i></li> <li>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>Not aware of any.</i></li> <li>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>Not aware of any.</i></li> <li>5. Do you feel well informed about the site's activities and progress? <i>Yes, there are regular reports submitted by PRP Contractor.</i></li> <li>6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 13:00 hrs <b>Date:</b> 16 March 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> Town of Woodstock Offices		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Alan Walker, Jr.	<b>Title:</b> First Selectman	<b>Organization:</b> Town of Woodstock, CT
<b>Telephone No:</b> 860/928-1388x310	<b>Street Address:</b> 415 Route 169	
<b>Telecopy No:</b> 860/963-7557	<b>City, State, Zip:</b> Woodstock, CT 06281-3039	
<b>E-Mail Address:</b> firstselectman@woodstockCT.gov		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression of the project? (general sentiment) <i>He has heard nothing negative regarding the project.</i></li> <li>2. What effects have site operations had on the surrounding community? <i>Water testing at nearby drinking water wells is the only known impact..</i></li> <li>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>He was not.</i></li> <li>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>He was not.</i></li> <li>5. Do you feel well informed about the site's activities and progress? <i>He does.</i></li> <li>6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? <i>He thought that LSC is doing a good job on the project.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 14:00 hrs <b>Date:</b> 16 March 2009
<b>Type:</b> <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> contacted her at Town Offices		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Tina Lajoie	<b>Title:</b> Administrative Assistant	<b>Organization:</b> Town of Woodstock, CT Building, Water Pollution Control Authority, and Planning & Zoning Departments
<b>Telephone No:</b> 860/928-1388x328	<b>Street Address:</b> 415 Route 169	
<b>Telecopy No:</b> 860/963-7557	<b>City, State, Zip:</b> Woodstock, CT 06281-3039	
<b>E-Mail Address:</b> buildingclerk@woodstockCT.gov		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression of the project? (general sentiment) <i>She has not heard any complaints regarding the site during her tenure.</i></li> <li>2. What effects have site operations had on the surrounding community? <i>Her review of Department files did not reveal any complaints or citations regarding the site. She further stated that she was not aware of any community group that acts as a watchdog for the site.</i></li> <li>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>She was not aware of any.</i></li> <li>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>She was not aware of any.</i></li> <li>5. Do you feel well informed about the site's activities and progress? <i>She indicated that the Town receives copies of site documents.</i></li> <li>6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? <i>She had no recommendations.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 13:45 <b>Date:</b> 15 April 2009
<b>Type:</b> <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b>		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Mark Lewis	<b>Title:</b> Project Manager	<b>Organization:</b> Eastern District Remedial Program, CtDEP
<b>Telephone No:</b> 860/424-3760	<b>Street Address:</b> 79 Elm Street	
<b>Telecopy No:</b> 860/424-4057	<b>City, State, Zip:</b> Hartford, CT 06106-5127	
<b>E-Mail Address:</b> mark.lewis@ct.gov		
<b>Summary Of Conversation</b>		
<p>1. What is your overall impression of the project? (general sentiment)  <i>He is minimally involved in the project. CTDEP has been generally pleased with the project.</i></p> <p>Do you have any comments regarding the problems which been encountered which required changes to this remedial design and potentially, this ROD?  <i>He sees two remaining issues at the LSC Site.</i></p> <ul style="list-style-type: none"> <li>• <i>The possibility of vapor intrusion issues at onsite buildings – CTDEP recommends iterative soil source sampling, followed by soil vapor sampling, followed by indoor air sampling, with the need for each iteration based on the results of the previous;</i></li> <li>• <i>CT RSRs require source areas to be removed to the maximum extent prudent – this should be reassessed.</i></li> </ul> <p>2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results. <i>CTDEP receives regular reporting from LSC through W&amp;C.</i></p> <p>3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.</p> <p>4. Do you feel well informed about the site's activities and progress? <i>None.</i></p> <p>5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? <i>LSC has a "good attitude" toward the cleanup.</i></p>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 10:30 <b>Date:</b> 8 April 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> Northeast District Department of Health Office		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Maureen Marcoux	<b>Title:</b> Sanitarian	<b>Organization:</b> Northeast District Department of Health
<b>Telephone No:</b> 860/774-7350	<b>Street Address:</b> 69 South Main Street	
<b>Telecopy No:</b>	<b>City, State, Zip:</b> Brooklin, CT	
<b>E-Mail Address:</b> mmarcoux@nddh.org		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression of the project? (general sentiment) <i>LSC is doing their job.</i></li> <li>2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results. <i>No.</i></li> <li>3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses. <i>None on record.</i></li> <li>4. Do you feel well informed about the site's activities and progress? <i>Yes; water testing results are forwarded to NHHD regularly.</i></li> <li>5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 14:00 <b>Date:</b> 18 March 2009
<b>Type:</b> <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b>		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Richard Baron	<b>Title:</b> Fire Marshall	<b>Organization:</b> Woodstock Fire Department
<b>Telephone No.:</b> 860/963-2347	<b>Street Address:</b>	
<b>Mobile Phone No.:</b> 860/450-6264	<b>City, State, Zip:</b>	
<b>Telecopy No.:</b>		
<b>E-Mail Address:</b>		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression (general sentiment) of the project? <i>Good.</i></li> <li>2. What is the current status of construction (e.g., budget and schedule)? <i>None ongoing.</i></li> <li>3. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD? <i>None to his knowledge.</i></li> <li>4. Have any problems or difficulties been encountered which have impacted construction progress or implementability? <i>None to his knowledge.</i></li> <li>5. Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)? <i>None.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 13:00 <b>Date:</b> 8 April 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> Town of Woodstock Offices		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Ed Munroe	<b>Title:</b> Deputy Fire Chief	<b>Organization:</b> Woodstock Fire Department
<b>Telephone No.:</b> 860/963-0456	<b>Street Address:</b> 415 Route 169	
<b>Mobile Phone No.:</b> 860/617-5414	<b>City, State, Zip:</b> Woodstock, CT 06281-3039	
<b>Telecopy No.:</b>		
<b>E-Mail Address:</b>		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression (general sentiment) of the project? <i>The project is going fine.</i></li> <li>2. What is the current status of construction (e.g., budget and schedule)? <i>Not known.</i></li> <li>3. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD? <i>None.</i></li> <li>4. Have any problems or difficulties been encountered which have impacted construction progress or implementability? <i>None.</i></li> <li>5. Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)? <i>None.</i></li> </ol>		

## INTERVIEW RECORD

<b>Site Name:</b> Linemaster Switch Corporation	<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review	<b>Time:</b> 09:00 <b>Date:</b> 8 April 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> LSC Offices	

### Contact Made By:

<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
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### Individual Contacted:

<b>Name:</b> Jack Markey, LEP	<b>Title:</b> Project Manager	<b>Organization:</b> Woodward & Curran, Inc.
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<b>Telephone No.:</b> 203/271-0379	<b>Street Address:</b> 1520 Highland Avenue
<b>Mobile Phone No.:</b> 860/214-9795	<b>City, State, Zip:</b> Cheshire, CT 06410
<b>Telecopy No.:</b> 203/271-7952	
<b>E-Mail Address:</b> jmarkey@woodardcurran.com	

### Summary Of Conversation

1. What is your overall impression (general sentiment) of the project?  
*It is the best project of its size that he has ever seen, both from the perspective of the willingness of the PRP to perform the required activities, and the effort expended.*
2. What is the current status of remediation (e.g., budget and schedule)? What is your estimation of the time until cleanup goals are achieved?  
*He has no way to estimate the timeframe for soil interim cleanup goal achievement. Groundwater concentrations have dropped significantly during the remedial process, and are on schedule to achieve goals within the timeframe in the ROD and ESD to the ROD.*
3. Do you have any comments regarding the problems which been encountered which required changes to this remedial design and potentially, this ROD?  
*The cleanup continues to proceed in accordance with the goals of the ESD to the ROD.*
4. Have any problems or difficulties been encountered which have impacted construction progress or implementability since the ESD to the ROD was completed?  
*No. The longest downtime was two days, following a lightning strike on a control panel.*
5. Is the remedy functioning as expected? How well is the remedy performing?  
*The groundwater extraction portion of the remedy is functioning as expected.*
6. What is your interpretation of the monitoring data? Are there any trends that show contaminant levels are decreasing?  
*Groundwater extraction keeps the groundwater plume on the LSC property and protects the potential receptors. Groundwater contaminant concentrations are generally decreasing, with the exception of monitoring well MW28DB.*
7. Please describe the continuous on-site O&M presence, including staff and activities. Also describe W&C staff and frequency of site inspections and activities.  
*LSC personnel maintain the treatment system and perform the required reporting, W&C personnel are called in for system redesign issues, and perform groundwater monitoring and reporting tasks.*
8. Please summarize the significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last five years. How do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.  
*There have been no changes during the past five years.*

9. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.  
*Several recommendations regarding changes to long-term monitoring and reporting have been made in recent LTM Reports, and LSC and W&C are awaiting EPA and CTDEP approval following the Second Five-Year Review.*
10. Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)?  
*No additional comments.*

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 09:00 <b>Date:</b> 8 April 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> LSC Offices		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Karl Kasper, CG	<b>Title:</b> Senior Vice President	<b>Organization:</b> Woodward & Curran, Inc.
<b>Telephone No:</b> 800/426-4262	<b>Street Address:</b> 1520 Highland Avenue	
<b>Telecopy No:</b>	<b>City, State, Zip:</b> Cheshire, CT 06410	
<b>E-Mail Address:</b> kkasper@woodardcurran.com		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression (general sentiment) of the project? <i>Excellent.</i></li> <li>2. What is the current status of remediation (e.g., budget and schedule)? What is your estimation of the time until cleanup goals are achieved? <i>Remediation is on schedule and budget.</i></li> <li>3. Have any problems or difficulties been encountered which have impacted construction progress or implementability since the <i>ESD to the ROD</i> was completed? <i>None.</i></li> <li>4. Is the remedy functioning as expected? How well is the remedy performing? <i>The groundwater remedy is performing as expected. The soil remedy is not active but is under a deed restriction – there might be an advantage to removing the maintained cover from the soil source area. He was amenable to reassessing the soil remedy.</i></li> <li>5. What is your interpretation of the monitoring data? Are there any trends that show contaminant levels are decreasing? <i>Groundwater concentrations are decreasing in accordance with the <u>ESD to the ROD</u>.</i></li> <li>6. Please describe the continuous on-site O&amp;M presence, including staff and activities. Also describe W&amp;C staff and frequency of site inspections and activities. <i>LSC and W&amp;C make an excellent team in performing O&amp;M.</i></li> <li>7. Please summarize the significant changes in the O&amp;M requirements, maintenance schedules, or sampling routines since start-up or in the last five years. How do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. <i>None.</i></li> <li>8. Have there been unexpected O&amp;M difficulties or costs at the site since start-up or in the last five years? If so, please give details. <i>All minor - the control panel was the largest, with a two-day delay.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>They have been proposed – EPA and CTDEP approval pending completion of <u>Second Five-Year Review</u>.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>Recommended that LTM reporting be decreased from semi-annual to annual; and that LSC and W&amp;C be included in the review of the Draft Second Five-Year Review. Further noted that LSC takes their obligation to cleanup the LSC Site seriously, and have done a</i></li> </ol>		

*phenomenal job – LSC does the right thing at the right time. Finally, Mr. Kaspar opined that LSC has implemented one soil remedy that failed due to inadequate site characterization (the fault of the PRP contractor, not the PRP) and that LSC should not be required to implement another soil remedy.*

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 09:00 <b>Date:</b> 8 April 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> LSC Offices		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Joseph Carlone	<b>Title:</b> President	<b>Organization:</b> Linemaster Switch Corporation
<b>Telephone No:</b> 860/974-1000	<b>Street Address:</b> 29 Plaine Hill Road	
<b>Telecopy No:</b> 860/974-9100	<b>City, State, Zip:</b> Woodstock, CT 06281	
<b>E-Mail Address:</b> jcarlone@linemaster.com		
<b>Summary Of Conversation</b>		
<p>1. What is your overall impression (general sentiment) of the project? <i>The project is going according to plan, and there have been no complaints from the community.</i></p> <p>2. What is the current status of remediation (e.g., budget and schedule)? What is your estimation of the time until cleanup goals are achieved? <i>The project is on schedule and runs within the budget.</i></p> <p>3. Have any problems or difficulties been encountered which have impacted construction progress or implementability since the ESD was completed? <i>No.</i></p> <p>4. Is the remedy functioning as expected? How well is the remedy performing? <i>The remedy is performing according to plan.</i></p> <p>5. What is your interpretation of the monitoring data? Are there any trends that show contaminant levels are decreasing? <i>Remediation is proceeding as predicted.</i></p> <p>6. Please summarize the significant changes in the O&amp;M requirements, maintenance schedules, or sampling routines since start-up or in the last five years. How do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. <i>None.</i></p> <p>7. Have there been unexpected O&amp;M difficulties or costs at the site since start-up or in the last five years? If so, please give details. <i>All minor ones, discussed by others.</i></p> <p>8. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>LSC has been proactive regarding O&amp;M, stocking replacement parts onsite in order to save money and reduce downtime.</i></p> <p>9. Do you have any comments, suggestions, or recommendations regarding the project? <i>LSC has spent \$14 million on the cleanup, and \$1.5 million last year. He feels the project is going well, and does not need any changes. He agrees with reducing the frequency of LTM reporting.</i></p>		

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<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 09:00 <b>Date:</b> 8 April 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> LSC Offices		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Ken Dery	<b>Title:</b> Manager	<b>Organization:</b> Linemaster Switch Corporation
<b>Telephone No:</b> 860/974-1000	<b>Street Address:</b> 29 Plaine Hill Road	
<b>Telecopy No:</b>	<b>City, State, Zip:</b> Woodstock, CT 06281	
<b>E-Mail Address:</b>		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression (general sentiment) of the project? <i>He is satisfied with the LSC/W&amp;C team's performance. The project is working well to do the job.</i></li> <li>2. What is the current status of remediation (e.g., budget and schedule)? What is your estimation of the time until cleanup goals are achieved? <i>Extraction rates were re-estimated 5 years ago during the <u>ESD to the ROD</u>, and are on track.</i></li> <li>3. Have any problems or difficulties been encountered which have impacted construction progress or implementability since the <i>ESD to the ROD</i> was completed? <i>No.</i></li> <li>4. Is the remedy functioning as expected? How well is the remedy performing? <i>The remedy is working well and doing the job.</i></li> <li>5. What is your interpretation of the monitoring data? Are there any trends that show contaminant levels are decreasing? <i>Drinking water is safe and the plume is contained.</i></li> <li>6. Do you have any comments, suggestions, or recommendations regarding the project? <i>No additional comments.</i></li> </ol>		

## INTERVIEW RECORD

<b>Site Name:</b> Linemaster Switch Corporation		<b>EPA ID No.:</b> CTD001153923
<b>Subject:</b> Linemaster Switch Corporation Five-Year Review		<b>Time:</b> 09:00 <b>Date:</b> 8 April 2009
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b> LSC Offices		
<b>Contact Made By:</b>		
<b>Name:</b> Joseph Schmidl	<b>Title:</b> Project Manager	<b>Organization:</b> Weston Solutions, Inc.
<b>Individual Contacted:</b>		
<b>Name:</b> Steve Radcliffe	<b>Title:</b> Maintenance Manager	<b>Organization:</b> Linemaster Switch
<b>Telephone No:</b> 860/974-1000	<b>Street Address:</b> 29 Plaine Hill Road	
<b>Telecopy No:</b> 860/974-9100	<b>City, State, Zip:</b> Woodstock, CT 06281	
<b>E-Mail Address:</b>		
<b>Summary Of Conversation</b>		
<ol style="list-style-type: none"> <li>1. What is your overall impression (general sentiment) of the project? <i>The project is working well to do the job.</i></li> <li>2. What is the current status of remediation (e.g., budget and schedule)? What is your estimation of the time until cleanup goals are achieved? <i>He agreed with the current estimates.</i></li> <li>3. Have any problems or difficulties been encountered which have impacted construction progress or implementability since the ESD was completed? <i>No.</i></li> <li>4. Is the remedy functioning as expected? How well is the remedy performing? <i>The remedy is functioning as expected.</i></li> <li>5. What is your interpretation of the monitoring data? Are there any trends that show contaminant levels are decreasing? <i>He felt that the data reporting were redundant (too frequent).</i></li> <li>6. Please describe the continuous on-site O&amp;M presence, including staff and activities. Also describe W&amp;C staff and frequency of site inspections and activities. <i>LSC supplies 24-hour monitoring of the groundwater recovery and treatment systems. Any issues are immediately addressed. Replacement parts for the system are stored onsite. The longest downtime during the past 5 years was two days, following the loss of a control panel following a lightning strike. When LSC replaced the control panel, they purchased an extra as a replacement. W&amp;C acts as the technical lead on the project. LSC handles the mechanical components. W&amp;C personnel are always available for consultation, and LSC and W&amp;C communicate weekly via weekly reporting. Flow meters were upgraded, at which time, LSC bought a case to serve as future replacements.</i></li> <li>7. Please summarize the significant changes in the O&amp;M requirements, maintenance schedules, or sampling routines since start-up or in the last five years. How do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. <i>Quarterly and semi-annual monitoring was terminated for certain wells, which has helps save money.</i></li> <li>8. Have there been unexpected O&amp;M difficulties or costs at the site since start-up or in the last five years? If so, please give details. <i>Abovementioned controller issue.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe</li> </ol>		

changes and resultant or desired cost savings or improved efficiency. *No.*  
10. Do you have any comments, suggestions, or recommendations regarding the project?  
*No additional comments.*