

January 27, 2006

Mr. Gerold Noyes  
Waste Management Division, Sites Management Section  
Vermont Department of Environmental Conservation  
103 South Main Street/West Building  
Waterbury, VT 05671-0404

Re: Report for Soil Investigation of Closed Underground Petroleum Storage Tank at  
H. A. Manosh Corporation, Morrisville, Vermont  
Vermont UST facility #1935 - Vermont Site #98-2431  
JCO Project No. 1-0862-6

Dear Gerold:

This letter serves as a report of an investigation performed in accordance with the work plan dated October 25, 2005 at H.A. Manosh's corporate office (see Figure 1, Site Location Map) located in Morrisville, Vermont (the Site). This report describes our approach to complete the investigation of the potential soil contamination adjacent to the pump island and beneath the former waste oil underground storage tank (UST) at the Site.

### **1.0 INTRODUCTION**

The Johnson Company was on site December 20, 2005 and January 4, 2006 to collect continuous soil cores from two locations to determine the potential degree and extent of residual petroleum contamination in the subsurface that was discovered during an UST removal that was performed by The Johnson Company on April 29, 1998. The Site is located at 120 Northgate Plaza, Morrisville, Vermont. This work was requested in a letter dated September 28, 2005 from the Sites Management Section (SMS) of the Vermont Department of Environmental Conservation (VTDEC) for Sites where no recent activity has occurred.

### **2.0 FIELD METHODOLOGY**

The Johnson Company was on site on December 20, 2005 and on January 4, 2006 to collect continuous soil cores from two locations as outlined in our up-dated work plan dated October 25, 2005. The first soil core location was immediately southeast of the pump island located at the back and east of H.A. Manosh's warehouse. The second soil core was located in the grave of the former waste oil UST which was formerly located just north of H.A. Manosh's main office building (see Figure 2, Aerial Map). The total depth of each boring and sampling protocol was determined by field screening soils for the presence or absence of any petroleum contaminated soils using a calibrated photoionization detector (PID).

On December 20, 2005 H.A. Manosh utilized their own cable tool drill rig and drillers (The Johnson Company provided support and over-sight to screen the soils) to accomplish the soil coring effort at the two previously identified core locations. The cable tool rig utilized a four (4) inch diameter split spoon to retrieve the soil cores at the cored location next to the pump island, but due to the nature of the soils (dry sand and gravel) the cored holes continued to collapse at six feet below ground surface (bgs). A decision was made on December 20, 2005 for The Johnson Company to return to the site at a later date with our direct push drill rig to continue the soil boring effort. Direct-push soil samples were collected using The Johnson Company's Ingersoll Rand A300 drill rig and dual tube Enviro Core soil collection system on January 4, 2006.

### **3.0 RESULTS**

Soil cores were collected from the two borings to a total depth of 17.3 feet bgs and 19 feet bgs from the pump island, and the grave of the former waste oil UST respectively on January 4, 2006. Continuous soil samples at both boring locations were inspected for visual and olfactory evidence of petroleum contamination, and screened using a calibrated PID and bag headspace method. The end depths at the two cored locations were determined by collection of a sample with no visual, olfactory, or PID evidence of petroleum contamination. Table 1 in Attachment 1 out-lines the results of the soil screening effort performed at the Site. Continuous soil samples were collected and held in Ziploc baggies on ice, for later sampling, at vertical intervals of 2 feet from the ground surface to the total depth of the boring at the pump island, and from 10 feet to the total depth at the former waste oil UST boring. The soil cores are summarized in boring logs included as Attachment 2 of this report.

Four sub-samples were delivered to Eastern Analytical Inc. (EAI) Laboratories of Concord, New Hampshire for analysis. One sub-sample from each boring location was chosen for analysis in order to demonstrate the maximum concentration of contaminants remaining in the soils (based on PID field screening), and the second was from the deepest soil sample collected to demonstrate that the contamination has not migrated down to the groundwater table. All the soil samples were placed in sample jars and packed in a cooler on ice and shipped to EAI via over night delivery. The samples were analyzed for petroleum volatile organic compounds (VOCs) by EPA Method 8021B, and for total petroleum hydrocarbons (TPH) by EPA Method 8015 for diesel range organics. The analytical reports for the soil samples collected from the Site on January 4, 2006 are included in Attachment 3 of this report.

The soil analytical results from the field investigation on January 4, 2006 are summarized in Table 2 located in Attachment 1 of this report. SB-1 and SB-2 soil samples were collected from the soil boring location southeast of the pump island, and east of the H.A. Manosh warehouse. SB-3 and SB-4 soil samples were collected from the former waste oil UST grave located north and in front of the H.A. Manosh's main office building. The soil analytical results indicate that no VOC compounds above the laboratories detection limits were detected in any of

Mr. Gerold Noyes  
Vermont Department of Environmental Conservation  
Waterbury, VT

January 27, 2006  
Page 3

the four soil samples. The results from the analysis for TPH indicated that SB-1 and SB-4 collected from the deepest cored interval had no detectable compounds above the laboratories detection limit. The soil samples collected from and intermediate zone in each boring had low detectable compounds for TPH. The analytical results for TPH for SB-2 (at 6-8' bgs) east of the pump island was 120 mg/Kg of soil and for SB-3 (at 9-11' bgs) located in the former waste oil UST grave was 260 mg/Kg of soil. Both intervals had concentrations below the risk-based guidelines for industrial properties (set at 1,000mg/Kg of soil) out-lined in the Agency Guidelines for Petroleum Contaminated Soil and Debris by VTDEC.

#### 4.0 CONCLUSIONS AND RECOMENDATIONS

The proposed scope of work was designed to determine the vertical extent and magnitude of residual petroleum contamination in the subsurface at the Site. The magnitude of petroleum contamination that was detected in each boring was below risk-based guidelines for industrial properties, and what little petroleum contamination that was detected appears to be isolated at a shallow depth of 6-8' bgs near the pump island and between 9-11' bgs in the former waste oil UST grave. The analytical results from samples collected at greater depths indicate that there is no contamination that extends down to the groundwater at either of these two cored locations.

Based on the information gathered during the site investigation and the results from the analytical data The Johnson Company is requesting that the Site be considered for a SMAC designation.

Please do not hesitate to call me at 229-4600 with any questions pertaining to this Site.

Sincerely,

THE JOHNSON COMPANY, INC.

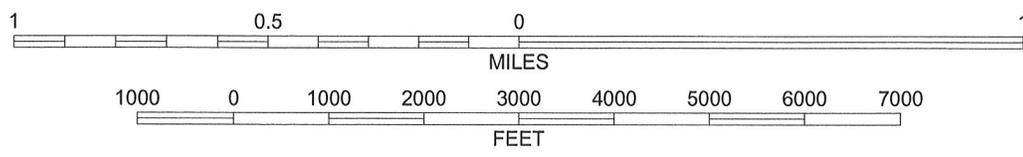
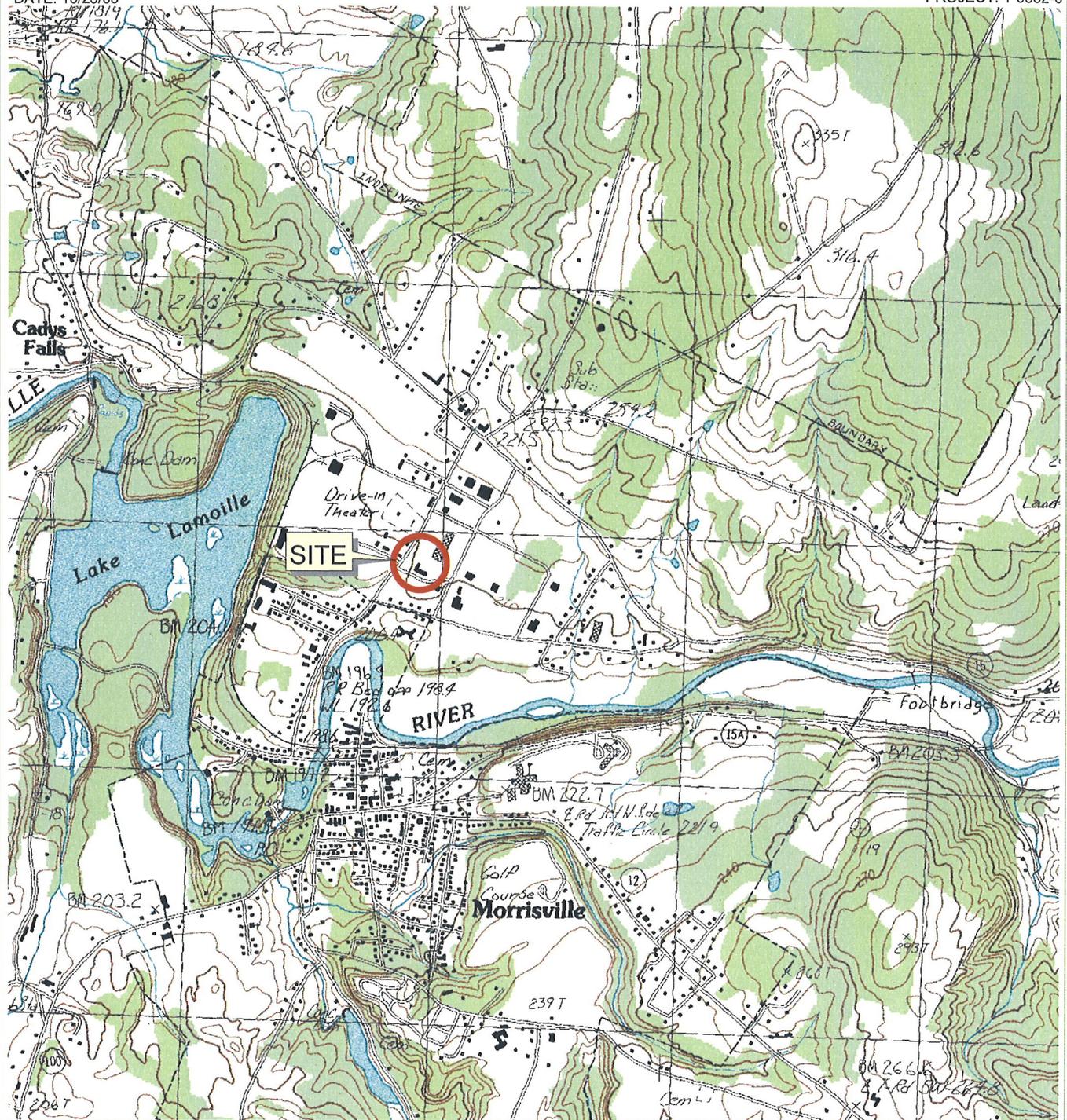
By: 

Thomas R. Osborne  
Project Scientist/Geologist  
Field Programs Manager  
Email: [TRO@jcomail.com](mailto:TRO@jcomail.com)

Attachments

cc Mr. Gary Nolan, H.A. Manosh Corp

## FIGURES



CONTOUR INTERVAL: 20 FEET



BASE MAP: USGS 7.5 Minute Topographic Quadrangle

**FIGURE 1: SITE LOCATION MAP**  
**HA MANOSH CORP.**  
**SMS SITE# 98-2431, MORRISVILLE, VT**

**THE JOHNSON COMPANY, INC.**  
 Environmental Sciences and Engineering  
 100 STATE STREET  
 MONTPELIER, VT 05602



**FIGURE 2: AERIAL MAP  
HA MANOSH CORP.  
SMS SITE# 98-2431, MORRISVILLE, VT**

**THE JOHNSON COMPANY, INC.**  
Environmental Sciences and Engineering

100 STATE STREET MONTPELIER, VT 05602

DATE: 1/23/06  
DRAWN BY: MJR

PROJECT: 1-0862-6  
SCALE: 1" = 200'

# ATTACHMENT 1

## TABLES

**TABLE 1**  
**Summary of Soil Headspace Concentrations**  
**Morrisville, VT**

Location	Date	Depth (ft. bgs)	Head Space Reading <sup>1</sup> (ppmV)	Notes
Pump Island Boring	12/20/05	0-2'	3.0	
		2-2.8'	1.7	
		2.8-3.6'	4.1	
		4-5'	2.8	
		5-6'	10.6	
Pump Island Boring	01/04/06	6-8'	38	Sampled (SB-2)
		8-10'	21	
		9.3-11.3'	8	
		11.3-13.3'	2.2	Sampled (SB-1)
		13.3-15.3'	3.8	
		15.3-17.3'	1.8	
Former Waste Oil UST Boring	01/04/06	9-11'	4.0	Sampled (SB-3)
		11-13'	2.2	
		13-15'	1.6	Sampled (SB-4)
		15-17'	3.1	
		17-19'	3.0	
Notes: 1. Head space readings are concentration listed in parts per million by volume (ppmV) via PID and is the maximum reading recorded for the sample interval.				

**TABLE 2**  
**Soil Analytical Summary Table**  
**Morrisville, VT**  
**January 4, 2006**

Compound	Pump Island		Waste Oil UST Boring		Trip Blank
	Deep (15.3-17.3')	Shallow (6-8')	Shallow (9-11')	Deep (17-19')	
	SB-1	SB-2	SB-3	SB-4	
MTBE	ND<100	ND<100	ND<100	ND<100	ND<100
Benzene	ND<50	ND<50	ND<50	ND<50	ND<50
Toluene	ND<50	ND<50	ND<50	ND<50	ND<50
Ethylbenzene	ND<50	ND<50	ND<50	ND<50	ND<50
Xylenes, Total	ND<50	ND<50	ND<50	ND<50	ND<50
1,3,5 TMB	ND<50	ND<50	ND<50	ND<50	ND<50
1,2,4 TMB	ND<50	ND<50	ND<50	ND<50	ND<50
Naphthalene	ND<300	ND<300	ND<300	ND<300	ND<300
TPH	ND<50	120	260	ND<50	

Notes: All compounds are in units of ug/kg except TPH values are mg/kg  
 MTBE = Methyl tert butyl ether  
 TMB = Trimethyl Benzene  
 TPH = Total Petroleum Hydrocarbon

**ATTACHMENT 2**  
**SOIL BORING LOGS**

The Johnson Company, Inc.  
 100 State St. Suite 600  
 Montpelier, VT 05602  
 (802) 229-4600

# Pump Island Boring

Project: HA Manosh  
 Location: Morrisville, VT  
 Job #: 1-0862-6  
 T.O.C. Elevation (ft):  
 Ground Elevation (ft):  
 Easting (ft):  
 Northing (ft):  
 Geologist: TRO

Depth	Maximum PID above background (ppm)	Geology	Description
0			Snow Pack
1	3		Frozen brown medium sand to sub-round gravel.
2			Brown moist medium to coarse sand, some sub-angular and sub-round gravel
3	1.7		No Recovery
4	4.1		Dark brown moist medium sand to gravel
5			No Recovery
6	2.8		Brown dry medium sand to gravel (gravel to 0.2'), little silt
7	10.6		Hard Rock
8	38		Brown dry well sorted coarse sand, some gravel to 0.15'
9			No Recovery
10	21		Brown dry coarse sand and gravel, little medium to fine sand, odor
11			No Recovery
12	8		Brown dry coarse sand to gravel, some medium to fine sand, slight odor
13			No Recovery
14	2.2		Brown dry medium to coarse sand, little gravel, slight odor
15			No Recovery
16	3.8		Brown dry medium to coarse sand, trace gravel, no odor, stone in basket
17			No Recovery
18	1.8		Brown dry medium to coarse sand, little gravel, slight odor
19			No Recovery
20			Brown dry fine sand to coarse sand, no odor
21			No Recovery

Drilling Date: 1/4/2006

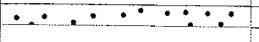
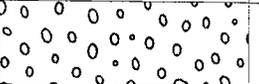
Drilling Company: JCO

Drilling Method: Envirocore

The Johnson Company, Inc.  
 100 State St. Suite 600  
 Montpelier, VT 05602  
 (802) 229-4600

Project: HA Manosh  
 Location: Morrisville, VT  
 Job #: 1-0862-6  
 T.O.C. Elevation (ft):  
 Ground Elevation (ft):  
 Easting (ft):  
 Northing (ft):  
 Geologist: TRO

# Waste Oil UST Boring

Depth	Maximum PID above background (ppm)	Geology	Description
0			
1			
2			
3			
4			
5			Boring location was opened up to 9.0' bgs via a Boulder Blaster
6			
7			
8			
9	4		Brown dry moist to wet medium sand to gravel, no odor.
10			No Recovery
11	2.2		Rock in basket, no odor
12			No Recovery
13	1.6		Brown moist medium to coarse sand, little gravel, no odor
14			No Recovery
15	3.1		Brown dry medium to coarse sand, little gravel
16			No Recovery
17			No Recovery
18	3		Brown dry coarse sand some medium sand, trace gravel, no odor
19			No Recovery

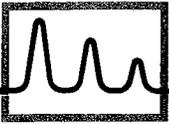
Drilling Date: 1/4/2006

Drilling Company: JCO

Drilling Method: Envirocore

**ATTACHMENT 3**

**ANALYTICAL RESULTS**



**eastern analytical**

*professional laboratory services*

Tom Osborne  
The Johnson Company  
100 State Street  
Montpelier, VT 05602



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 52466  
Client Identification: Manosh | 1-0862-6  
Date Received: 1/5/2006

Dear Mr. Osborne :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at [www.eailabs.com](http://www.eailabs.com) for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted  
< : "less than" followed by the reporting limit  
TNR: Testing Not Requested  
ND: None Detected, no established detection limit  
RL: Reporting Limits  
%R: % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

This report package contains the following information: Sample Conditions summary, Analytical Results/Data and copies of the Chain of Custody.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

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

Sincerely,

Lorraine Olashaw, Lab Director

1-18-06

Date

4

# of pages (excluding cover letter)



## SAMPLE CONDITIONS PAGE

Eastern Analytical, Inc. ID#: 52466

Client: The Johnson Company

Client Designation: Manosh | 1-0862-6

Temperature upon receipt (°C): 2.3

Received on ice or cold packs (Yes/No): Y

Lab ID	SampleID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
52466.01	SB-1	1/5/06	1/4/06	soil	96.2	Adheres to Sample Acceptance Policy
52466.02	SB-2	1/5/06	1/4/06	soil	93.9	Adheres to Sample Acceptance Policy
52466.03	SB-3	1/5/06	1/4/06	soil	89.2	Adheres to Sample Acceptance Policy
52466.04	SB-4	1/5/06	1/4/06	soil	95.8	Adheres to Sample Acceptance Policy
52466.05	Trip Blank	1/5/06	1/4/06	soil	100.0	Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater : Inorganics, 19th Edition, 1995; Microbiology, 20th Edition, 1998
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 2nd edition, 1992



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 52466

Client: The Johnson Company

Client Designation: Manosh | 1-0862-6

Sample ID:	SB-1	SB-2	SB-3	SB-4	Trip Blank
Lab Sample ID:	52466.01	52466.02	52466.03	52466.04	52466.05
Matrix:	soil	soil	soil	soil	soil
Date Sampled:	1/4/06	1/4/06	1/4/06	1/4/06	1/4/06
Date Received:	1/5/06	1/5/06	1/5/06	1/5/06	1/5/06
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Date of Analysis:	1/6/06	1/6/06	1/6/06	1/6/06	1/6/06
Analyst:	JDS	JDS	JDS	JDS	JDS
Method:	8021Bmod	8021Bmod	8021Bmod	8021Bmod	8021Bmod
Dilution Factor:	1	1	1	1	1
Methyl-t-butyl ether(MTBE)	< 100	< 100	< 100	< 100	< 100
Benzene	< 50	< 50	< 50	< 50	< 50
Toluene	< 50	< 50	< 50	< 50	< 50
Ethylbenzene	< 50	< 50	< 50	< 50	< 50
mp-Xylene	< 50	< 50	< 50	< 50	< 50
o-Xylene	< 50	< 50	< 50	< 50	< 50
1,3,5-Trimethylbenzene	< 50	< 50	< 50	< 50	< 50
1,2,4-Trimethylbenzene	< 50	< 50	< 50	< 50	< 50
Naphthalene	< 300	< 300	< 300	< 300	< 300

8021Bmod: The samples were analyzed by GCMS using method 8260B.



# LABORATORY REPORT

**Eastern Analytical, Inc. ID#: 52466**

Client: **The Johnson Company**

Client Designation: **Manosh | 1-0862-6**

Sample ID:	SB-1	SB-2	SB-3	SB-4
Lab Sample ID:	52466.01	52466.02	52466.03	52466.04
Matrix:	soil	soil	soil	soil
Date Sampled:	1/4/06	1/4/06	1/4/06	1/4/06
Date Received:	1/5/06	1/5/06	1/5/06	1/5/06
Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date of Extraction/Prep:	1/5/06	1/5/06	1/5/06	1/5/06
Date of Analysis:	1/5/06	1/5/06	1/5/06	1/5/06
Analyst:	JTO	JTO	JTO	JTO
Method:	8015BDRO	8015BDRO	8015BDRO	8015BDRO
Dilution Factor:	1	1	1	1
DRO(Diesel Range Organics C10-C28)	< 50	<b>120</b>	<b>260</b>	< 50

CHAIN OF CUSTODY RECORD

52466

MECH  
5-15-02  
19-02  
DRO

Client / Project Name <b>Manosh</b>		Project Location <b>Morrisville VT</b>				
Project No. <b>1-0862-6</b>		Field Logbook No. <b>TR0-8</b>				
Sampler (Signature) <i>[Signature]</i>		Chain of Custody Tape No. <b>8421</b>				
Sample No. / Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYZES	REMARKS
SB-1	1/4/06	10:00		Soils	X	Results to
SB-2	↓	10:15		↓	X	Tom Osborne
SB-3	↓	12:00		soils	X	(802) 229-4600
SB-4	↓	12:10		—	X	For (802) 229-5876
Trip Blank						
Relinquished by: (Signature) <i>[Signature]</i>					Received by: (Signature)	
Relinquished by: (Signature) <b>UPS</b>					Received for Laboratory: (Signature) <i>[Signature]</i>	
Sample Disposal Method: <b>HO</b>					Disposed of by: (Signature)	
SAMPLE COLLECTOR				ANALYTICAL LABORATORY		Shipper ID #
100 State Street, Suite 600 Montpelier, VT 05602 (802) 229-4600 Fax (802) 229-5876				EAI Concord, NH		<b>UPS overnight</b>
THE JOHNSON COMPANY, INC. Environmental Sciences and Engineering				Tracking #		<b>17X46599 22 1002 2494</b>

WHITE - To accompany sample to the lab and returned to the Johnson Co. YELLOW - Lab copy PINK - Transporter copy GOLD - Sampler copy  
 Revised from NEBS CUSTOM printing service 1-800-689-6827 NEBS, Inc. Phosphorburgh, NH 03450 www.nebs.com  
 Darl J. J. 2.3.01. an 110  
 Rel. No. © 16410504

**ATTACHMENT 4**

**FIELD NOTES**

Location Morrisville, VT

Date 12/20/05

Project / Client Manosh 1-0862-6

TRD

On Site 0745

Overcast mid Teens Breezy Light Snow

Calibrate PID 100ppm Span Gas = 100ppm O<sub>2</sub>

Setup Rig east of building  
± 18' off building.

9:25 Start split spurn <sup>ID</sup> 4.8" x 24" spurn

9:50 Sample collected 0-2.0'

1.7' Rec. 0-0.3' snow pack

0.3-1.0' Frozen Br MS-grv. (sub round)

1.0-1.7' Br moist MS-CS, some

sub org. - rand grv. (Bank run grv.)

PID = 3.0 ppm

10:15

2-4.0' 1.6' Rec.

0-0.8' Br Br moist MS-Grv.

0.8-1.6' Br/Tan moist well sorted

MS, some Grv.

PID 0-0.8' 1.7ppm

0.8-1.6' 4.1 ppm

Hole open to 4.0' Bgs

Location Morrisville, VT Date 12/20/05Project / Client Manach 1-0862-6  
TRG

4-6' 2.0' Rec.  
0-1.0' Br Dry ms-gry lit silt.  
 Grv to 0.2, 1.0-2.3' rock  
 1.3-2.0' Br Dry well sorted CS  
 same grv. to 0.15'  
 PID 0-1.0 2.8 ppm  
 1.3-2.0 10.6 ppm  
 Hole still open 6.0 Bgs.  
 6-8' 1.4' Rec. 0-1.4' Br Dry CS-MS  
 same BS to Grv to 0.2'  
 PID = 10.1 ppm

Hole collapsed to 6.0' Bgs. Unable to  
 continue sampling w/ 4" spoon

Collected a sample from 3-6.0' Bgs. to hold.

Decision was made to return with Jco's  
 rig to encasement/auger to retrieve  
 soil samples.

Off Site - 12:45

Location Morrisville VT

Date 1/4/06

Project / Client Manesh 1-0862-6

TRO/WFD

017 Site 8:00

Overcast 10° slight breeze

Calibrate PID 100 ppm SG = 101 PPM OVM

Pump Island Boring

Boring east of Pump Island

Boiler Blast to 6.0' (see field notes 12/20/05)  
split spoon to 10'

SB-1

6-8'

1.7' Rec. Br Dry CS + Grv

lit ms-fs. odor sampled

PID = 3.8 ppm  
SB-2 6-8'  
10.15

8-10'

1.3' Rec. Br Dr CS + Grv

Some ms-fs. slight odor

PID = 21. ppm

switched to Envirocore sampling.

9.3-11.3

Br Dr 0.3' Rec. MS - CS

lit grv. PID = 8.0 ppm  
slight odor

11.3-13.3

Br Dry MS - CS.

Rec. 0.3'

PID = 2.2 ppm No odor

13.3-15.3

Br Dr CS - ms Trigrx PID = 2.8 ppm

No odor Rec. 0.2' Stone in Basket

146 Location Morrisville VT Date 1/4/2016  
 Project / Client Manosh 1-0862-6  
TRO/WPP

16.3-17.3 : 0.5 Rec. Br Dry MS-CS  
 PID = 1.8 ppm No odor  
 [ Sampled SB-1 16.3-17.3 10:00 ]  
 Waste Oil UST Boring  
 10:30 Setup @ former waste oil tank 15B to 8.0'  
 Enviro cone [ 9.0-11.0 ] 0.5 Rec PID = 4.0 ppm  
 Dr Br moist-wat MS-Grv. No odor  
 [ Sampled SB-3 12:00 ]  
 11-13' 0.2 Rec. Rock in Basket Remediat Care  
 Tip. PID = 2.2 ppm No odor  
 [ 13-15 ] 0.3 Rec. Br Moist MS-CS 1.6 ppm  
 PID = 1.6 ppm No odor  
 [ 15-17 ] 1.1 Rec. Br Dry MS-CS 1.6 ppm  
 PID = 3.1 ppm No odor  
 [ 17-19 ] 1.2 Rec. Br Dr CS same MS to grv.  
 PID = 3.0 ppm [ Sampled SB-4 12:10 ]  
 No odor

Back filled Both borings with Sand.  
 Off Site 12:00  
 Samples collected in 20 ml vial/syringe VOCs  
 407 Amber jar for TPH  
 shipped samples via overnight by UPS to  
 EHS - Concord, NH COC # 89421