

Prepared by:

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December 10, 1998

PN: 41141-001-211:S19447

UNDERGROUND STORAGE TANK CLOSURE REPORT MASS DEVELOPMENT OPERATIONS DIVISION DEVENS COMMERCE CENTER DEVENS, MASSACHUSETTS

UST NO. T-3773

DCC 981275 DM

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EXECUTIVE SUMMARY

The subject 10,000-gallon fiberglass underground storage tank (UST) T-3773 located adjacent to Building #3773 was utilized to store #2 heating oil and was installed in 1984 by the United States Army. The tank was exposed, cleaned, and removed by Fleet Environmental Services on September 28, 1998. No groundwater, free product, or soil staining was observed in the excavation. Field screening methods, including soil jar headspace screening and Petroflag analysis on soil adjacent to the tank and associated piping indicated limited hydrocarbon impact. One composite confirmatory soil sample consisting of five aliquots was collected from the four tank grave sidewalls and the excavation base and analyzed for Extractable Petroleum Hydrocarbons (EPH) by Massachusetts Department of Environmental Protection (MADEP) Method 98-1. The analytical data was compared to applicable reportable concentrations for soil (RCS-1) which are outlined in the Massachusetts Contingency Plan (MCP) {310 CMR 40.0000}. Hydrocarbon contamination in excess of RCS-1 levels was not identified. Based upon the field screening results and the laboratory data, the tank grave was backfilled, compacted and the grass area restored.

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1.0 INTRODUCTION

This underground storage tank (UST) Closure report has been prepared in accordance with the

Commonwealth of Massachusetts UST Closure Assessment Manual, dated April 6, 1996.

Project specifications prepared for Mass Development at the Devens Commerce Center (DCC)

including the UST Closure Protocol Addendum to Tier 1A Permit dated June 14, 1996, Project

Specifications dated March 24, 1998, and the Release Abatement Measure Plan dated June 11,

1998, were also followed for the Multiple UST Removal project at the former United States

Army base located in Devens, Massachusetts.

2.0 BACKGROUND

Tank T-3773 was located adjacent to Building #3773 on 78 Barnum Road at the Main Post of the

U.S. Army Base in Devens, Massachusetts. Upon the closure of Fort Devens, ownership of the

UST was transferred from the U.S. Army to Mass Development at the Devens Commerce

Center. Pursuant to the Work Scope outlined in Administrative Consent Order ACO-CE-96-

3001 issued by the Massachusetts Executive Office of Environmental Affairs to Mass

Development for waste site cleanup in connection with the Fort Devens redevelopment, 99 USTs

have been removed under this project.

The subject UST was located north of Building #3773, as illustrated in Figure 1. Global

Positioning System (GPS) coordinates for the former tank location are 3024128 northing and

633539 easting. GPS data was collected in order to verify the tank location in the absence of

current physical reference points. The United States Army installed the subject 10,000-gallon

fiberglass UST in 1984. The tank was used to store #2 heating fuel and was installed with

fiberglass straps and anchors. The associated tank piping included one 1-inch PVC insulated pipe

containing three ½-inch copper lines leading to a boiler inside of the building.

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3.0 UST REMOVAL

The subject UST was uncovered, cleaned and removed on September 28, 1998. Fleet Environmental Services (Fleet) of Lakeville, Massachusetts removed the top of the tank using a Komatsu Excavator in order to enter and clean the inside of the tank. A vacuum truck was used to remove the remaining #2 fuel oil, tank sludge, and residual water and product generated during tank cleaning activities. After cleaning procedures, the tank was pulled from the excavation and inspected by the Devens Fire Department. The Closure Permit for the subject UST is provided in Appendix A. The tank was stored at Fleet's onsite staging area located in a fenced area on Antietam Street, and subsequently demolished, placed in a roll-off container and hauled for disposal as demolition debris to Browning Ferris Industries (BFI) in Fall River, Massachusetts. Liquid generated during tank closure was transferred from the vacuum truck to a storage tanker located at Fleet's staging area and later hauled for disposal to Global Oil in Revere, Massachusetts. Appendix B includes documentation for oil disposal generated from the subject UST and various other onsite #2 fuel oil USTs. Soil removed during the tank excavation was stockpiled adjacent to the tank grave and the hole was temporarily secured with CAUTION tape. No impacted material that required off-site disposal was generated during the tank removal.

4.0 FIELD OBSERVATIONS

Upon removal, the UST was observed to be in good condition with no holes, external staining or indications of damage. Groundwater, free product or visual evidence of stained soils was not observed in the excavation. In order to better view and screen the entire tank grave, the excavator removed sloughed soil along the excavation base and sidewalls. The tank grave base and four sidewalls were initially screened in at least two different locations using a Photoionization Detector (PID).

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One composite soil sample, consisting of five aliquots from the base of the excavation and four sidewalls at a depth of 8' - 12' below ground surface (bgs), was collected with the excavator bucket. The sample was composited using a stainless steel sample spoon and bowl. Prior to sample collection, the spoon and bowl were decontaminated with non-phosphate soap and water. The composite sample was placed in amber glass soil jars for soil headspace, Petroflag and laboratory analyses. Figure 1 presents PID headspace and Petroflag results as well as confirmatory sample locations.

Soil jar headspace screening analysis was conducted in accordance with Appendix A of the Massachusetts Department of Environmental Protection UST Closure Manual. Two jars for soil headspace were covered with aluminum foil and set aside for a minimum of ten minutes. No jar headspace reading greater than 0.1 parts per million (ppm) was recorded.

Petroflag hydrocarbon analysis was then conducted on ten grams of soil from the initial composite sample. Petroflag analysis consists of a liquid extraction and analysis of soil combined with a chemical reagent. Petroflag is most effective for heavy oils such as #2 and #4 fuel oils and gives an estimate of hydrocarbon concentrations in a given sample. A Petroflag reading of 70 ppm for the composite sample was recorded.

5.0 LABORATORY ANALYTICAL RESULTS

Based on the PID and Petroflag screening results, no further excavation was conducted and the composite sample was sent to AMRO Laboratory in Merrimack, New Hampshire. The composite sample was analyzed by Massachusetts Department of Environmental Protection (MADEP) Method 98-1 for Extractable Petroleum Hydrocarbons (EPH). As outlined in the project specifications, a list of four fuel oil-related polynuclear aromatic hydrocarbons (PAHs), which are specific target analytes of the C₁₁-C₂₂ aromatic hydrocarbon range, are included with the EPH analytical data and presented in Appendix C. Analytical results for the composite sample

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indicated the absence of hydrocarbon impact in excess of the most stringent MADEP Massachusetts Contingency Plan Reportable Concentrations for soil (RCS-1).

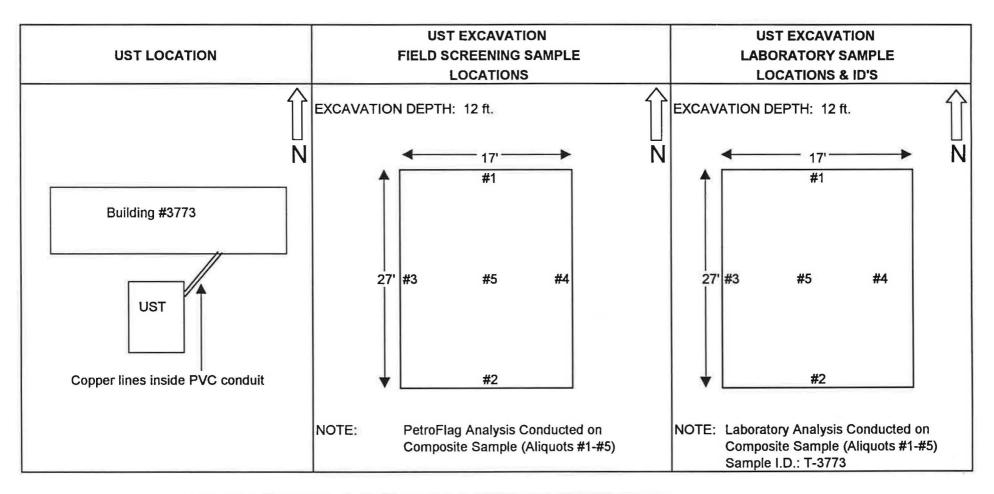
6.0 BACKFILLING

Stockpiled soil and off-site backfill material were used to fill the excavation. The hole was backfilled in approximately 18-inch lifts, sprayed with water, and compacted using the excavator bucket and a vibrating roller. No nuclear density compaction tests were completed during backfilling procedures. The excavation was backfilled to grade and the grass area restored.

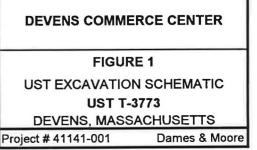
7.0 CONCLUSIONS

Removal of the subject fiberglass UST was conducted in accordance with the Commonwealth of Massachusetts UST Closure Assessment Manual and the project specifications as outlined for Mass Development at the Devens Commerce Center. The tank was cleaned, removed, inspected, crushed, and hauled in a roll-off container with other fiberglass tanks removed during the course of the project. Residual product, sludge and water was removed with a vacuum truck and was hauled to an oil recycling facility in bulk quantity with other on-site #2 fuel UST liquids. No groundwater, free product, or soil staining was observed in the excavation. Soil screening results including PID headspace and Petroflag analyses indicated limited hydrocarbon impact to soils in the tank grave. One composite soil sample consisting of five aliquots from the four excavation sidewalls and the base was collected and analyzed for EPH by a Massachusetts-certified laboratory. Analytical results indicated the absence of hydrocarbon impact in excess of the MADEP MCP (RCS-1) Reportable Concentrations. Based upon the analytical data and field screening results, the excavation was backfilled, compacted and the grass area restored.

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	SCREENING SUMMARY								
LOCATION	OCATION SAMPLE # DE		PID READING (PPM)	PETROFLAG RESULT (PPM)					
North	#1	8'-12'	0.0	NA					
South	#2	8'-12'	0.0	NA					
West	#3	8'-12'	0.0	NA					
East	#4	8'-12'	0.1	NA					
Base	#5	12'	0.0	NA					
Composite	(#1- #5)	8'-12'	0.0	70.0					



APPENDIX A TANK CLOSURE PERMIT



The Commonwealth of Massachusetts

Department of Public Safety-Division of Fire Prevention

APPLICATION FOR PERMIT FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

	10001
	C.82 S.40 M.G.L.
To: HEAD OF FIRE DEPARTMENT Devens	DIG SAFE NUMBER
Caty or Town	9 5 3 5 09 3 0 2 Stort Date 2-23-18
In accordance with the provisions of Chapter 148. G.L. as p Section 38A Application is hereby made by <u>FLEET Environ</u> (Name of Person, F.	provided in MENTAL SERVICES LLC irm or Corporation)
Address St C	AKEUILE MASS
For permission to remove and transport underground steel	storage tank(s) from
F-37) Street address (cit	ty br town)
FDID#17919 to approved Tank Yard# RIESNOR C	CORP #OIL
State clearly type of inert gas used in steel storage tank Type of inert gas	used
Name of Person, Firm, Corporation disposing tank <u>Floor En</u>	romental Services, LIC
Date issued - rejected 19 Date of expiration 19 paid/due 3 grature Fee (MGL C-148, S-10A)	Stone
The Commonwealth of Massa	chusett s
DEPARTMENT OF PUBLIC SAFETY—DIVISION OF	FIRE PREVENTION
PERMIT	
FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK	YARD C.02 8.40 M.G.L.
In accordance with the provisions of Chapter 148, G.L. as prov Section 38A this permit is granted to Name: <u>Heet Environmental Services LLC</u>	elded in \$ 5380730X
Full name of person, firm or Corporation To transport underground steel storage tank(s), to Approved tank yard#	
to Approved tank yard# ** State clearly type of	01/
inert gas used in	
steel storage tank steel tank: method	
FDID#/79/9 Name and address of contractor disposing tank FUEET ENV. SERV	ا، در
Fee paid \$ Location to which tank will be transported	
~ #0.11	
This permit will expire 19	Torolect
Signature of office (Head of Fire I	<pre>ial granting permit(TITLE) Dept.)</pre>

APPENDIX B WASTE DOCUMENTATION

JAMICSON FOLDON

FLERSE UNIVERSALED



No: 356659

FALL RIVER LANDFILL 1080 AIRPORT ROAD FALL RIVER, MA 02720 TELEPHONE: (508) 678-8860

Time In: 14:10:20 Time Out: 14:47:36 : 12-23-98 97:60 LMS #: 3020251 Ticket # : A84805 CHS # : 0002251

Eustoner : FLEET ENVIRONMENTAL SERVICES

Vehicie 4 : 000010 Lic Plate:

OUTSIDE CUSTOMERS

O Transporter: C

Source Cd : XXXX

Consent : FIBER-GLASS Operator: JUNE JARGBEK

Scale In # : 1 Scale Out #: 2

Gruss Wt : 31.54 lare Wt: Net Wt: 14.35 t 17.19

Bill My Item. Descr \$/Unit Extended ROC

CONSTRUCTI 14.35 t

WARNING

TRANSPORTING ANY UNAUTHORIZED HAZARDOUS WASTE TO THIS FACILITY FOR DISPOSAL IS PROHIBITED BY LAW. PERSONS VIOLATING THIS PROHIBITION ARE SUBJECT TO CIVIL AND CRIMINAL PROSECUTIONS.

- JAMIESON FOLDER

RE: Fleet Ft Downs

No: 356669

FALL RIVER LANDFILL 1080 AIRPORT ROAD FALL RIVER, MA 02720 TELEPHONE: (508) 678-8860

: 12-23-98 Time In: 14:12:13 Time Out: 15:04:15 Date Ticket 1 : 984806 LMS #: 0000261 CHS # : 01/02261

Customer : FLEET ENVIRONMENTAL SERVICES

Vehicle # : 000021

OUTSIDE CUSTOMERS

PO &

Source Cd : XXXX

Comment : FIBER-GLASS JAMIESON

Operator: JUNE JARABEK

Scale In # : 1

Gross Wt :

Scale Out 1: 2 Tare Wt:

Transporter: 0

Lic Plate:

Net Wt: 18,18 t

Ites

Descr 🟓

Bill Qty

18.07

1/Unit

Extended

WARNING

TRANSPORTING ANY UNAUTHORIZED HAZARDOUS WASTE TO THIS FACILITY FOR DISPOSAL IS PROHIBITED BY LAW. PERSONS VIOLATING THIS PROHIBITION ARE SUBJECT TO CIVIL AND CRIMINAL PROSECUTIONS.

ROC	CONISTRUCTION 15-152
	11/1/1/
-0	
(1)	RECYCLED PAPER HOVE A NICE DAY!!!

SIGNATURE:__



236 Lunenburg St. Fitchburg, MA 01420 978-345-5300 / 978-348-2528

SLIP M2 25033

Date 大学的	Driver Truck No.	Trailer No.		Terminal I	ol No.	Split Ticket #
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		This is to certif	y that the abov	re-named materials are progulations of the Department	roperly classified, descri	bed, packaged, market	and labeled,	and are in	proper condition for transportation
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THIS ME	MORAN	IDUM is an acknowledgement or duplicate, covering th	that a bill of lading has been issued and is not the Original e property named herein, and is intended solely for filling or	Bill of Lading, not a copy record.		Shipper	's No
Name of C	arrier)	PREFORINIA and tariffs in effect on the date of this	CE TRIMS.	_ SCAC		Carrier's	s No
carrier of all or any	ribed below, in appare poration in possession y of said property ove	r all or any portion of said route to destinat	and condition of contents of packages unknown), marked, confet to carry to its usual place of delivery at said destination, if on its on, and as to each party at any time interested in all or any of as by agreed to by the shipper and eccepted for himself and his said	id property, that every service to be our	which said company se to deliver to anoth	(the word compa er carrier on the usit be subject to a	ry being understood throughout this contract as meaning route to said destination. It is mutually agreed, as to each all the conditions not prohibited by law, whether printed or
Consigned	to	1150N 01			(Mail or stree	t address of c	consignee ~ For purposes of notification only
Destination			State County WM MA	Zip Deliv Add	very ress*		
Route	<u>all</u>	WAY		(*To be filled in or	nly when shippe	r desires and	governing tariffs provide for delivery thereat
Delivering Carrier	_	FOR MANCE	TRANS. C	ar or ehicle initials	9		No. 176
Number of Packages		Description of articles, sp	pecial marks, and exceptions	*Weight (Sub. to correction)	Class or rate	Check column	Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this
1000	GAL	LONS VI	RGIN BLACK				shipment without payment of freight and all other lawful charges.
	tr	2 1- 1-	11				(Signature of consignor)
		K FUEL C	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			•	If charges are to be prepaid, write or stamp here, "To be Prepaid". Received \$
							property described hereon. Agent or Cashier
							Per
Collect O	n Delivery	and remit to	9	C.O.D. Charge to be paid by	Shipper Consigne		Charges Advanced:
Note. – where ti The agr⊿ed or c	he rate is depen declared value o	h two ports by a carrier by water, dent on value, shippers are required the property is hereby or to be not exceeding	the law requires that the bill of lading shall state irred to state specifically in writing the agreed or d	whether it is "carrier's or shipp eclared value of the property.	er's weight".	• •	HM EMERGENCY RESPONSE TELEPHONE NUMBER (§172.604)
This is to ce	ertify that the	e above-named material	s are properly classified, described, epartment of Transportation. Per		d labeled, a	nd are in	proper condition for transportation
Shipper: _/		Some All	Date:	Agent:	9/	escen	Date:9/28/98
	d-office address BLS (Rev. 8/		প্থ	**			

THIS ME	MORAN	DUM is an acknowledgeme or duplicate, covering	ent that a bill of lading has b the property named herein	een issued and is not the C , and is intended solely for	Original Bill of filling or reco	f Lading, not a copy rd.		Shipper	's No
lame of Ca	arrier) $\overline{\mathcal{L}}$	ER FULLIA	NLE T	TANS		SCAC		Carrler's	s No
property describ y person or corpor rier of all or any	bed below, in appare oration in possession of said property over	SEVANS Is good order, except as noted (content of the property under the contract) agr	ats and condition of contents o see to carry to its usual place nation, and as to each party at			and destined as indicated below, road or its own water line, otherw perly, that every service to be per	which said company (I se to deliver to anothe formed herounder sha	he word compa r carrier on the a be subject to	ry being understood throughout this contract as meaning toute to said destination. It is mutually agreed, as to each at the conditions not prohibited by law, whether printed or
nsigned 1	to UNISO	al all				24	(Mail or street	address of o	consignee – For purposes of notification only.)
stination	LOBA		State CCEUM	County	Zip		very ress*		
ute	BEST	WAZ				(*To be filled in o	nly when shipper	desires and	governing tariffs provide for delivery thereat.
ivering rrier	PER	FORMANC	1 TIA	NS	Car Vehi	or cle Initials	49		No. 1>6
umber of ackages	Γ	Description of articles,	special marks, ar	nd exceptions		*Weight (Sub. to correction)	Class or rate	Check column	Subject to Section 7 of conditions, if this shipment is to be delivered to the consigned without recourse on the consignor, the consignor shall sign the following statement:
00	6	ALLON	VIVEIN	BLA	K				shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
		-1 -1	A1-9	ATT 4 A					(Signature of consignor)
-	#	- J. 01C							If charges are to be prepaid, write or stamp here, "To be Prepaid". Received \$
					-				Agent or Cashier
									(The signature here acknowledges only the amount prepaid.)
ollect On	Delivery	and remit to				C.O.D. Charge to be paid by	Shipper Consigned		Charges Advanced:
le. – where the agreed or de acifically state	ne rate is depend eclared value of ad by the shipper	two ports by a carrier by wate lent on value, shippers are re the property is hereby to be not exceeding	quired to state specific	ally in writing the agree	ed or decla	ther it is "carrier's or shipp tred value of the property.	er's weight".		HM EMERGENCY RESPONSE TELEPHONE NUMBER (§172.604)
is is to ce cording to	the applica	regulations of the I	als are properly of Department of Tra	classified, describ ansportation. Po	bed, pa er	ckaged, marked an	d labeled, ar	id are in	proper condition for transportation
ipper:	1157	1 miles	1	Date:		Agent:	91	our	Date: 10-2-8
	office artirate	200	Ula						

Permanent post-office address of shipper FORM NO. 1 BLS (Rev. 8/95)

THIS SHIPPING	ORDER must be legibly filled in, in Ink, in Indelible Per Carbon, and retained by the Agent	ncil, or in			Shipper	's No
(Name of Carrier)	PER FOUMANLE TO and tariffe in effect on the date of this Bill of Lading:	ANS	SCAC.		Carrier's	s No
any person or corporation in possession carrier of all or any of said property over	If good order, except as noted (corrents and condition of contents of part of the property under the contract) agrees to carry to its usual place of d all or any portion of said trust to be destination, and as to each party at any Appendix B to Part 1035) which are hereby agreed to by the shipper and	elivery at said destination, if on its own time interested in all or any of said pro	road or its own water line, otherwis	se to deliver to anoth	er carrier on the	route to said destination. It is multisfly agreed, as to each
onsigned to	ni oil			(Mail or street	address of c	consignee , For purposes of notification only.)
estination (-/ OR A	State C PETROLEUM	County Zip		/ery ress*		1
oute Beet	- WAX		(*To be lilled in or	ly when shipper	r desires and	governing tariffs provide for delivery thereat.)
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30 6	ALLOW VIrtIN	BLACK				shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
- 1	-1 -1	•				(Signature of consignor)
500 \$	FJ OIC					If charges are to be prepaid, write or stamp here, "To be Prepaid".
						Received 5 to apply in prepayment of the charges on the properly described hereon.
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I the shipment moves between ote. – where the rate is depen he agreed or declared value o pecifically stated by the shippe		In writing the agreed or decla	her it is *carrier's or shipp- red value of the property.	er's weight".		HM EMERGENCY RESPONSE TELEPHONE NUMBER (§172.604)
his is to certify that the	a above-named materials are properly cla by regulations of the Department of Tran-	assified, described, pac sportation. Per	ckaged, marked and	d labeled, a	nd are in	proper condition for transportation
hipper:	Judy H	Date:	Agent:	. 9	erce	10-2-8
Permanent post-office address FORM NO. 1 BLS (Rev. 8/		2		(Ag		etach and retain this Shipping Order t sign the Original Bill of Lading.

DEI he property descri any person or corp serrier of all or any artition, herein conti	DEN State of Second Sec	ent good order, except as noted in of the property under the contra rail or any portion of sald route in Appendix B to Part 1035) which	contents and condition of contents of packages unknown), (d) agrees to carry to its usual place of delivery at said dest o destination, and as to each party at any time interested in are hareby agreed to by the shipper and accepted for hims	marked, consigned, inution, if on its own all or any of said pri elf and his assigns.	and destined as indicated below, road or its own water line, otherwiperly, that every service to be per	which said company se to deliver to snoth ormed hereunder sh	(the word comparer carrier on the	hy being understood throughout this contract as meaning route to said destination. It is mutually agreed, as to each all the conditions not prohibited by law, whether printed or
onsigned		T FNV	IRON MENTA	,		(Mail or street	address of (consignee – For purposes of notification only
SLO.	BAL	011	State County MA		Add	ress*_C <i>F</i>	/c (S	governing tariffs provide for delivery therea
		CK SOR		Car Vehi	or cle Initials			No.
umber of ackages			les, special marks, and exceptions		*Weight (Sub. to correction)	Class or rate	Check	Subject to Section 7 of conditions, if this shipment is to be delivered to the consignor without recourse on the consignor, the consignor
000	# 1	2 FUEL	OIL (BLAC	11)				shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all othe lawful charges.
		9)				(Signature of consignor)
								if charges are to be prepaid, write or stamp here, "To be Prepaid".
*: *i			<u>, </u>		14 (1			Received \$ to apply in prepayment of the charges on the property described hereon.
1							- 5	Agent or Cashler
			the state of the s	60				Per
ollect O	n Delivery	and remit to	of the second		C.O.D. Charge to be paid by	Shipper Consigne	•	Charges Advanced:
ne shipment	he rate is deper seciared value o	ndent on value, shippers a of the property is hereby	y water, the law requires that the bill of lading are required to state specifically in writing the	shall state whe agreed or deck	ther it is "carrier's or shipp ared value of the property.	er's weight".	х.	HM EMERGENCY RESPONSE TELEPHONE NUMBER (§172.804)
agreed or d	ed dy ine snibor	er to be not exceeding		per _	aleanad madead an	d labolad a	nd are in	proper condition for transportation

Permanent post-office address of shipper FORM NO. 1 BLS (Rev. 8/95)

6 - - 4/21

APPENDIX C LABORATORY ANALYTICAL RESULTS



111 Herrick Street, Merrimack, NH 03054 TEL: (603) 424-2022 · FAX: (603) 429-8496

October 02, 1998

Mr. Brian House Fleet Environmental Svc., LLC 8 Harding St. Lakeville, MA 02347

RE Your project: 980340 Devens/Fleet Env.

Dear Brian:

Enclosed please find the results for the above-referenced project, received on September 28, 1998. AMRO operates a Quality Control Program which meets or exceeds EPA and state requirements. A copy of the appropriate State Certificate is attached. The enclosed Sample Receipt Checklist details the condition of your sample upon receipt. No quality control deviations which impact the enclosed results were noted during the analyses associated with this project. This project was assigned AMRO Project Number 20464. If you have any questions regarding this project in the future, please refer to this number.

Please be advised that any unused sample volume and sample extracts will be stored for a period of thirty (30) days from this report date. After this time, AMRO will properly dispose of the remaining sample. If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This letter is an integral part of your data report.

Please do not hesitate to call if you have any questions.

Sincerely,

In Steml

Richard Ravenelle Organics Laboratory Manager

Encl.



Laboratory Report Extractable Petroleum Hydrocarbons (EPH)

EPH ANALYTICAL RESULTS

Extraction Method: EPA 3541	Client ID	T-3773	
Method for Ranges: MADEP EPH 98-1			
Method for Target Analytes: MADEP EPH 98-1	AMRO Lab ID	20464-02	
EPH Surrogate Standards - Extraction	Date Collected	09/28/98	
Aliphatic: 1-Chlorooctadecane	Date Received	09/28/98	
Aromatic: o-Terphenyl	Date Extracted	09/29/98	
EPH Surrogate Standards - Analysis	Date Analyzed	10/02/98	
2-Fluorobiphenyl	Dilution Factor	1	
2-Bromonaphthalene	% Solids	93.6	
Range/Target Analyte	UNITS	RESULTS	RL
C ₉ -C ₁₈ Aliphatic Hydrocarbons ¹	mg/Kg	ND	51
C ₁₉ -C ₃₆ Aliphatic Hydrocarbons ¹	mg/Kg	ND	51
C ₁₁ -C ₂₂ Aromatic Hydrocarbons ^{1,2,3}	mg/Kg	ND	26
Naphthalene	mg/Kg	ND	0.26
2-Methylnaphthalene	mg/Kg	ND	0.26
Acenaphthene	mg/Kg	ND	0.26
Phenanthrene	mg/Kg	ND	0.26
2-Fluorobiphenyl % Recovery	%	90.1	N/A
2-Bromonaphthalene % Recovery	%	85.9	N/A
o-Terphenyl % Recovery	%	63.9	N/A
1-Chlorooctadecane % Recovery	%	57.1	N/A
Surrogate Acceptance Range	%	40-140%	40-140%

Hydrocarbon Range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range

ND = Not Detected at or above the Reporting Limit (RL) indicated.

COMMENTS:

CERTIFICATION

OLIVIII IOATION				
Were all QA/QC procedures	[X]Yes	[] No - See Comments		
Were all performance/acce	ptance standards for required QA/QC procedures	achieved?	[X]Yes	[] No - See Comments
Were any significant modifi	cations made to the EPH method, as specified in S	Sect 11.3?	[] No	[X] Yes - Details attached
	and penalties of perjury that, based upon my n, the material contained in this report is, to the			
SIGNATURE:	Van Stemmel	POSITION:	Organic Division	Manager
PRINTED NAME:	Arr/ Richard Ravenelle	_ DATE:	10/5	-198

² C₁₁-C₂₂ Aromatic Hydrocarbons exlude the concentration of Target PAH Analytes

Reporting limit based on calculated MDL, not the prescribed procedure in MADEP EPH Revision 1.0 method. N/A = Not Applicable

AMRO Environmental Laboratories Corporation 111 Herrick Street Merrimack, N.H. 03054 Office: 603-424-2022 Fax: 603-429-8496

CHAIN OF CUSTODY RECORD

Proj. No. 9803		ject Name	221	41	Fleet	Env.	Project S			er - A		/	/	//	1./	17	PAGE		
Samplers (S	ignature)	T	<u>()</u> .	Ma			Type Size, & No. of Containe	rs		Solid-S te-W er-Q ain	ing	7(H)	//	//	[/./				
Sta. No.	Date	Time	Comp	Grab		Station Location		-1		_		7					Remarks		
1-3701	2/58/28	1430		X	1-3	5701- Base	1- A-1	م - الماه	1	X	X					57-L	47 il		
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D-3756	N.	813	X			-3756	1	`		X									
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Bolinquished by (Signature)		Date Time 9/20/98 1580		15 80	Received by (Signature)	200	Results	Flu	<i>†</i> -	Send Results to: Flact Ens Orion House Daning Moure - Ken Richards Sale n NH									
Relinquished by (Signature)		Date Time		ne	Received by (Signature)		PO# Le135		(XAT) OHZJ-6240 (TAX)										
Relinquishe	Relinquished by (Signature)		Date Time			Received by (Signature)		AMRO Project No.			Sande #T-3701-Base -> 24-hr TAT.								
Relinquished by (Signature)		Date Time 9-28-90		ne	Received for Laboratory by (Signature)		Seal Inta	Seal Intact?			All sands >> list 4- (and or yours)						`` .		



Sam	ple Receipt Che	cklist	:			
Olivety for a few		AMDO	L	2	1.10	
Client: Heet	AMRO			1469		
Project Name: Denky/F/eet	Date I			8/98		
Ship via: (circle one) Fed Ex., UPS, 41	IRO Courier	Date [Jue:_	4/	9199	
Hand Del., Other Courier, Other		-				
		 ,				
Items to be Checked Upon Receipt		Yes	No	NA	Comments	
Custody Seals present?				V,		
2. Custody Seals Intact?				V,		
3. Air Bill included in folder if received?				1		
4. Is COC included with samples?		1,_				
5. Is COC signed and dated by client?		1				
Pick up temperature of the samples.				/		
Laboratory receipt temperature. Ten		V,				
Samples rec. with ice ice packs_\(\square\)		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				
Were samples received the same day	they were sampled?	1		_,		
Is client temperature < 6 degrees C?					/4	
If no obtain authorization from the clie						
Client authorization from:		ned by				
Is the COC filled out correctly and con	npletely?	1				
Does the info on the COC match the s		1/1				
Were samples rec, within holding time	e?	1				
12. Were all samples properly labeled?						
13. Were all samples properly preserved?	2					
14. Were proper sample containers used?						
15. Were all samples received intact? (no		1				
Were VOA vials rec. with no air bubbl				1		
17. Were the sample volumes sufficient	for requested analysis?	1				
18. Were all samples received?						
19. VPH Soils only:						
Samples preserved in Methanol or ai	r tight container?			- 1		
Samples received in Methanol coveri		1				
Samples received in air tight containe						
20. Subcontracted Samples:						
What samples sent:						
Where sent:						
Date:						
Analysis:						
TAT:						
21. Information entered into:						
Internal Tracking Log?		7				
Dry Weight Log?		1				
Client Log?		7				
Onen Log:						
Possived Pur P *	Data: 8/20/00					
Received By: Bi	Date: 9/28/99					
abeled By:	Date:			H		
ogged in By:	Date:					
Checked By:	Date:		- 1	1.0		

Volatile Petroleum Hydrocarbons (VPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on the use of a purge and trap gas chromatography mass spectrometer (GCMS) system to analyze samples for VPH. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates potential false positives for the target analytes while providing accurate hydrocarbon range data.

The chromatographic column is an HP-624 capillary column which has been validated by GCMS analysis of a gasoline standard to correctly identify the marker compounds and elution order of specific gasoline components. Batch quality control includes, at a minimum, method blank, laboratory control sample, and duplicate analysis. A matrix spike and/or matrix spike duplicate is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 0.6-2.8 mg/kg in soil and 25-110 μ g/L in water. The RL of this method for the target analytes ranges from approximately 0.05-0.13 mg/kg in soil and 2.0-5.0 μ g/L for water samples.

Extractable Petroleum Hydrocarbons (EPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on a solvent extraction and gas chromatography mass spectrometer (GCMS) analysis. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates the silica gel solid-phase fractionation step. False-positives for targeted PAH analytes are eliminated by using GCMS as the primary analysis technique.

The chromatographic column is a J&W Scientific DB-5ms capillary column. Internal standard calibration is performed using 5α -Androstane at a concentration of 40 ng/ μ L. o-Terphenyl and 1-Chlorooctadecane are added as surrogate compounds at 20 ng/ μ L in the sample extract. These two surrogates monitor the effects of the sample matrix and extraction efficiency. Two additional surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, are added to the finished extract prior to analysis to monitor instrument performance. Batch quality control includes, at a minimum, a procedure blank, laboratory control sample and duplicate sample analysis. A matrix spike is analyzed if sufficient sample is submitted to the laboratory.





Department of Environmental Protection

Division of Environmental Analysis Senator William X. Wall Experiment Station

certifies

M-NH012 Amro Environmental Lab 111 Herrick St. Merrimack, NH 03054

Laboratory Director: Nancy Stewart

for the Chemical Analysis of Potable and Non-Potable Water

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

Issued: 07/01/98

Director, Division of Environmental Analysis

06/30/99 Expires: