

# **RELEASE ABATEMENT MEASURES PLAN**

**89 COMMERCIAL STREET  
MALDEN, MASSACHUSETTS**

**RELEASE TRACKING NUMBER 3-0362**  
July 2010

*Prepared For:*



National Grid  
40 Sylvan Road  
Waltham, MA 02154

*Prepared By:*



Innovative Engineering Solutions, Inc.  
25 Spring Street  
Walpole, Massachusetts 02081  
(508) 668-0033

**RELEASE ABATEMENT MEASURES PLAN**

**89 COMMERCIAL STREET  
MALDEN, MASSACHUSETTS**

**RELEASE TRACKING NUMBER 3-0362**  
July 2010

**Prepared for:** National Grid  
40 Sylvan Road  
Waltham, Massachusetts 02451

**Prepared by:** Innovative Engineering Solutions, Inc.  
25 Spring Street  
Walpole, Massachusetts 02081

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Michael Lotti, L.S.P.  
Project Manager and LSP of Record  
License Number 4208

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Joseph E. Higgins, P.E., L.S.P.  
Project Reviewer

## **Release Abatement Measures Plan**

### **Soil Excavation 89 Commercial Street Street Malden, Massachusetts**

#### **MADEP Release Tracking Number: 3-0362**

Pursuant to the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000), this Release Abatement Measures (RAM) Plan has been prepared by Innovative Engineering Solutions, Inc. (IESI) on behalf of Massachusetts Electric Company d/b/a National Grid (National Grid). This RAM Plan presents the activities that will be conducted at the 89 Commercial Street property in Malden, Massachusetts to monitor construction and manage soil during the excavation of an area on the property for the installation of a patio by the current tenant. Refer to Figure 1 for a Site Locus and Figure 2 for a Site Plan of the property.

The 89 Commercial Street property is part of a larger former manufactured gas plant (MGP) that is listed by the Massachusetts Department of Environmental Protection (MassDEP) as a disposal site as defined by the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000). The MassDEP assigned Release Tracking Number (RTN) 3-0362 to the Malden MGP Site. Figure 2 depicts the location of the RAM Area in relation to the disposal site boundary of the former MGP. The former Malden MGP site has achieved a Temporary Solution and a Class C Response Action Outcome has been filed.

The content of this RAM Plan has been structured to address the specific information requirements set forth in 310 CMR 40.0444 (1)(a) through (j). The RAM Transmittal Form (Form BWSC-106) was submitted, along with this RAM Plan, electronically via the eDEP website.

**310 CMR 40.0444(1)(a)      the name, address, telephone number and relationship to the site of the person assuming responsibility for conducting the Release Abatement Measure;**

Name: Michele V. Leone  
Title: Manager, Site Investigation & Remediation – New England  
Address: National Grid  
40 Sylvan Road  
Waltham, Massachusetts 02451  
  
Telephone Number: (781) 907-3651

**310 CMR 40.0444(1)(b)      a description of the release or threat of release, site conditions, and surrounding receptors;**

The patio area excavation activities are being conducted as a RAM because these activities are being conducted within the known site boundary of RTN 3-0362. The site is listed due to the presence of compounds in the soil and groundwater associated with former MGP operations at the property. This site has achieved a Temporary Solution and a Class C Response Action Outcome has been filed. As such, no additional monitoring activities beyond the activities listed in this RAM plan will be conducted as part of this RAM.

The information presented below describing the release, site conditions and surrounding receptors, as it relates to the 89 Commercial Street property, was gathered during response actions previously completed at the disposal site as presented in the December 2001 report entitled *Report on Phase II Comprehensive Site Assessment* (Phase II Report), the June 2003 Phase III Remedial Action Plan (Phase III Report) and the February 2004 Class C p-RAO, all of which were prepared by Haley and Aldrich, Inc. (H&A); and the February 2009 *Five-Year Periodic Review of Temporary Solution for Partial Class C Response Action Outcome Statement* by IESI.

### *Description of the Release*

As previously stated, the subject property is part of a larger disposal site. An MGP operated for over 120 years on the larger disposal site, generating raw gas using oil and coal as feedstock, purifying the raw gas on site, and processing the waste materials from the generation and purification processes. Figure 3 depicts the historical MGP operational features. As a result of the MGP operations, coal tar and other residual wastes associated with MGP operations are present in the subsurface. The following subsections describe the subsurface conditions at the 89 Commercial Street property.

### *Site Conditions*

The property is generally paved and relatively flat; the ground surface rises steeply to the west of the property, where active railroad tracks for the Massachusetts Bay Transit Authority (MBTA) are located. The existing single-story concrete block building was vacant for 3+ years and is currently being renovated to house a sports training complex (i.e., baseball/softball batting cage and instruction):

- West of the property is the MBTA railroad tracks and, beyond the railroad tracks, an athletic field which is part of the City-owned Callahan Park.
- East of the property is Commercial Street and a National Grid (formally KeySpan) operations facility.
- North of the property is a liquor store, and
- South of the property is a building that has commercial/light industrial businesses.

The Phase II Report indicated that subsurface investigations were conducted at this property (1997 through 2000), and consisted of drilling 4 soil borings (97A-B608-OW, 97A-B609, 97A-B610-OW, 97A-B611), installing monitoring wells in two of the borings (97A-B608-OW and 97A-B610-OW), collecting soil and groundwater samples for laboratory analysis, and gauging monitoring wells. Based on this information, it appears the property is underlain to approximately 11.5 feet to 15 feet below grade with urban fill that contains primarily slag, cinders, sand, and gravel. An organic silt/peat layer is located below this fill layer and is 1.5 feet to 3 feet thick. Groundwater is present in monitoring wells on site at approximately 7 feet below grade. The shallow groundwater appears to flow toward the culverted Malden River in the northern portion of the property.

Dense Non-Aqueous Liquids (DNAPL) were observed in monitoring well 97A-B610-OW during the gauging conducted by H & A in 1997 through 1999 and also by IESI in November 2006, February 2009, and July, 2010. The DNAPL thickness ranged from 0.1 feet to 0.6 feet.

The soil borings indicate that coal tar saturated soils were observed in the subsurface. The coal tar saturated soils were observed from 11.5 feet to 12.5 feet below grade in 97A-B608-OW, 9 feet to 13 feet below grade in 97A-610-OW, and 12 feet to 15 feet below grade in 97A-611B.

A human health risk characterization was conducted for the former MGP site and included in the Phase II Report. As part of the risk characterization the subject property was included in the terrestrial portion of

the site. The risk characterization concluded that for current site uses, a condition of No Significant Risk of harm to human health exists at the property. However, a condition of No Significant Risk to public welfare cannot be demonstrated for the subject property due to the presence of UCL exceedences (i.e., DNAPL in the subsurface greater than 1/2 -inch and concentrations of chrysene in the deeper soil obtained from 97A-B608B-OW). A condition of No Significant Risk to public safety exists for the site.

More recently, once National Grid learned of the tenant's intention to install a patio on the leased property, IESI was requested to collect a sample of soil from the area designated for shallow excavation. On June 14, 2010, IESI personnel collected a composite sample from the planned patio area and submitted the samples, under a signed chain of custody, to Groundwater Analytical, Inc. of Buzzards Bay, Massachusetts. The soil samples were analyzed for Volatile and Extractable Petroleum Hydrocarbons (VPH and EPH) via MassDEP Methods, VOC via EPA Method 8260, polycyclic aromatic hydrocarbons (PAH) via EPA Method 8270, RCRA 8 Metals (various EPA Methods), total Cyanide, Physiologically Available Cyanide, polychlorinated biphenyls (PCBs), Sulfur Content, Ignitability and Reactivity. The exact methods used and the results are presented in the laboratory analytical data report included as Appendix A. Based on the detected lead concentration (220 milligrams per kilogram (mg/kg)), TCLP lead analysis was requested by the potential receiving facility and the results are also included in Appendix A.

In general, the soil exhibited the characteristics of an urban fill, however, because of its presence within the boundary of the former MGP site and the PAHs present within the soil at concentrations exceeding reportable concentrations, the soil will be managed as a remediation waste once excavated.

#### *Surrounding Receptors*

The residential population within a one-half mile radius of the property is estimated at greater than 15,000 people. No institutions, as defined by 310 CMR 40.0006, are located within 500 feet of the property.

According to MassGIS, except for the culverted Malden River, no other surface water bodies, including wetlands, vernal pools, ponds, lakes, streams, rivers, Outstanding Resource Waters, and reservoirs, are located within 500 feet of the site. In addition, there are no Areas of Critical Environmental Concern, habitats for Species of Special Concern or Threatened or Endangered Species, within 500 feet of the property.

The site is not located within any Current or Potential Drinking Water Source Areas as defined by 310 CMR 40.0006. Drinking water is supplied to the area by the Massachusetts Water Resource Authority (MWRA). The property is located in a medium yield Non-Potential Drinking Water Source Area. Callahan Park, a protected open space is located west of the property beyond the elevated MBTA railroad tracks from the 89 Commercial Street property. Callahan Park is part of the disposal site; response actions have been conducted at Callahan Park and have achieved a Class A-3 RAO. As part of the Class A-3 RAO, a Grant of Environmental Restriction has been recorded for Callahan Park. Another protected open space associated with the City of Malden is located approximately 500 feet northeast of the property.

**310 CMR 40.0444(1)(c) the objective(s), specific plan(s) and proposed implementation schedule for the Release Abatement Measure and proposed implementation schedule, including, as appropriate, plans and/or sketches of the site and any proposed investigative and/or remedial installations;**

The objective of this RAM Plan is to monitor construction and manage soil during excavation of the patio area. The estimated 18 feet long by 18 feet wide patio area will be excavated to approximately one foot below surface grade. Approximately 15 cubic yards of soil will be excavated during the activities. Excavation activities will be conducted in accordance with the MCP. The excavated soil will be transported to Environmental Soil Management, Inc. (ESMI) thermal desorption facility located in Loudon, New Hampshire for thermal treatment and recycling. The soil removal will be conducted using standard excavation equipment. The soil excavated will either be directly loaded onto dump trucks for transport to ESMI or temporarily stockpiled on site, then loaded on trucks for transport to ESMI. If temporary stockpiling on site is necessary, the soil will be stored on and under polyethylene sheeting pending removal. Any removed material will be managed in accordance with the provisions of 310 CMR 40.0030. The work is scheduled to start and be completed during the week of July 26, 2010.

**310 CMR 40.0444(1)(d) a statement as to whether Remediation Waste, Remedial Wastewater and/or Remedial Additives will be excavated, collected, stored, treated, discharged, applied, reused or otherwise managed at the site;**

As indicated above, Remediation Waste (i.e., soil) may be excavated, collected, stored, or otherwise managed at the site. As previously noted, there is a potential for up to 15 cubic yards of MGP impacted soil to be excavated and transported off-site for disposal in accordance with applicable regulations. No other Remediation Waste, Remedial Wastewater, or Remedial Additives are expected to be managed as part of this RAM.

**310 CMR 40.0444(1)(e) where appropriate, a proposed environmental monitoring plan, for implementation during and/or after the Release Abatement Measure;**

The work associated with this RAM will be conducted in accordance with a site specific Health and Safety Plan. As specified in the Health and Safety Plan, which has been previously submitted to the MassDEP as part of other ongoing site-related response actions, health and safety monitoring will be conducted during this RAM.

Specifically, routine monitoring of the ambient air for volatile organic compounds (VOCs) by a photoionization detector (PID) will be conducted during the RAM. The intent of the air monitoring will be to assess the impact of the excavation on the ambient air. IESI personnel will observe and document the removal, and obtain photographs of the removal activities.

The objective of this RAM Plan is to manage excess soil associated with the installation of a patio on the property. As such, no additional monitoring activities beyond those described above are proposed during this RAM.

**310 CMR 40.0444(1)(f)**      **a listing of federal, state and/or local permits likely to be needed to conduct the Release Abatement Measure;**

No permits are required for this RAM.

**310 CMR 40.0444(1)(g)**      **the seal and signature of the Licensed Site Professional who prepared the Release Abatement Plan;**

The LSP seal and signature are provided on the RAM Transmittal Form.

**310 CMR 40.0444(1)(h)**      **the certification required at 310 CMR 40.0442(4), if greater than 1500 cubic yards of Remediation Waste are to be excavated and managed at the disposal site; and**

At this time, it is expected that no more than 15 cubic yards of MGP impacted soil will be generated during these RAM activities. Therefore, the above referenced certification is not required.

**310 CMR 40.0444(1)(i)**      **any other information that the Department, during its review and evaluation of the Release Abatement Measure Plan, determines to be necessary to complete said plan, in view of site specific circumstances and conditions.**

If additional information is needed or questions regarding this plan arise, please contact Michael Lotti by telephone at (508) 668-0033 x 231 or by email at [m.lotti@IESIonline.com](mailto:m.lotti@IESIonline.com).





Innovative Engineering Solutions, Inc.  
25 SPRING STREET  
WALPOLE, MASSACHUSETTS 02081  
(508) 668-0033

0 2000

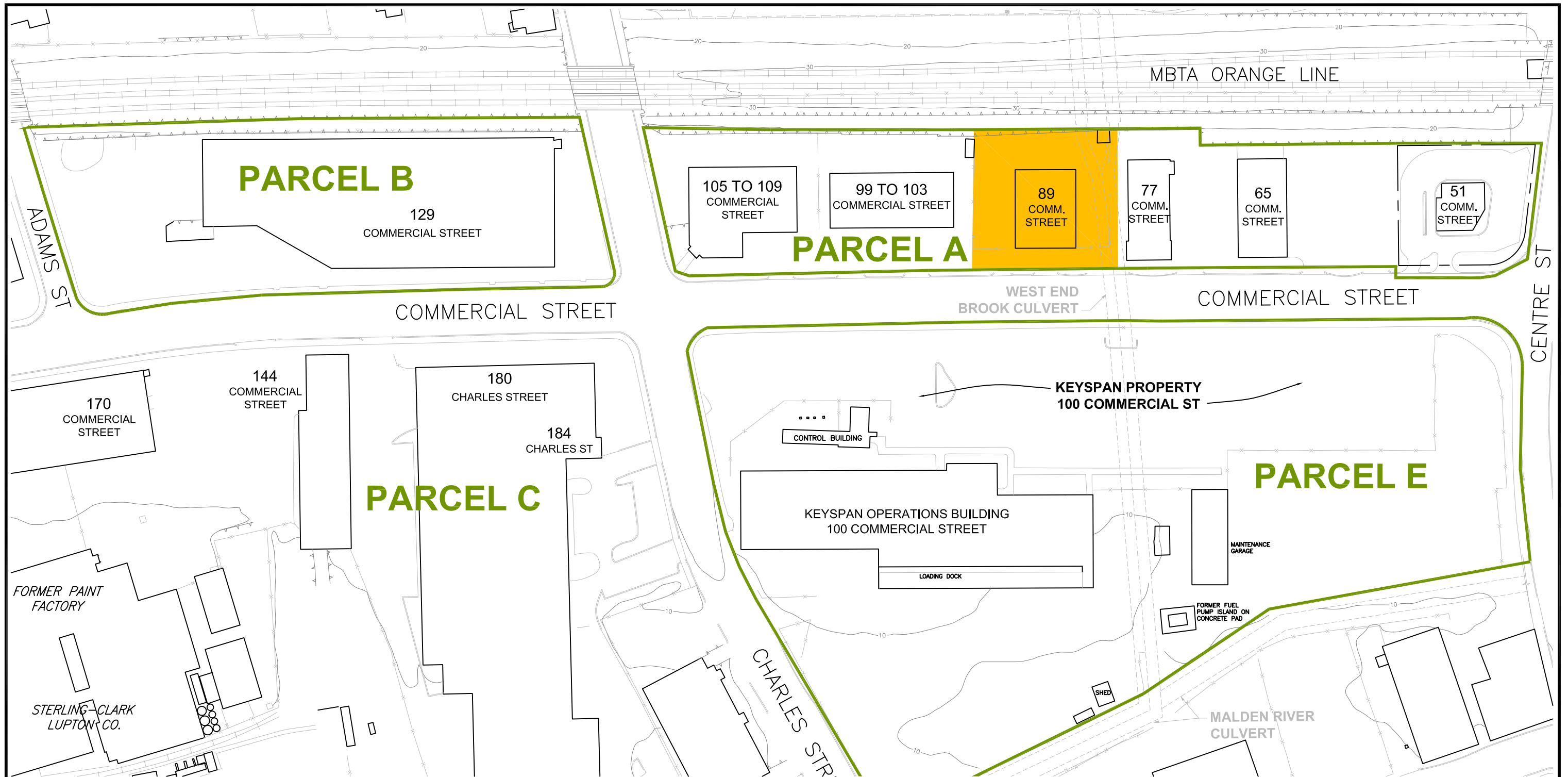
SCALE IN FEET  
1:24000

SITE LAT/LONG: 42°25'30"N 71°04'30"W  
UTM: 329,298E 4,699,051N ZONE 19  
USGS Topographic Map:  
Boston North, Massachusetts 1991

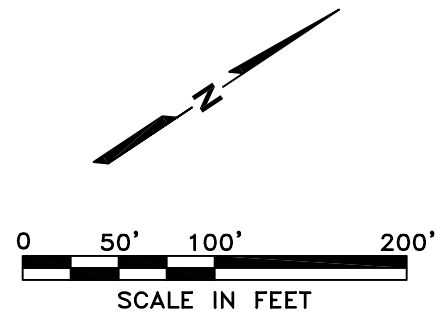
FIGURE 1  
**SITE LOCATION MAP**

Former Malden MGP Site  
Malden, Massachusetts





 **APPROXIMATE RAM AREA**



THIS PLAN BASED ON THE SITE PLAN DATED DECEMBER 2001  
BY HALEY & ALDRICH, INC.

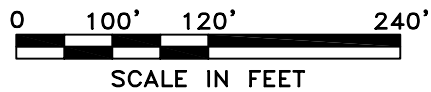
HALEY & ALDRICH, INC. NOTES:

1. BASE PLAN ADAPTED FROM "TOPOGRAPHIC WORKSHEET  
OF THE MANUFACTURED GAS PLANT, MALDEN, MA"  
FOR MASSACHUSETTS ELECTRIC COMPANY,  
WESTBOROUGH, MA, BY EASTERN TOPOGRAPHICS,  
WOLFEBORO, NH, SHEETS 1 AND 2, AT A SCALE OF 1 IN.  
EQUALS 40 FT., JUNE 1995, AND CITY OF MALDEN  
ASSESSOR'S PLAN SHEET NO. 53, BY FAY, SPOFFORD &  
THORNDIKE, INC., BOSTON, MA, AT A SCALE OF 1 IN.  
EQUALS 40 FT., UPDATED JUNE 1976 AND REVISED  
30 JULY 1979.



**Innovative Engineering Solutions, Inc.**  
25 SPRING STREET  
WALPOLE, MASSACHUSETTS 02081  
(508) 668-0033

TITLE				
RAM AREA				
SITE				
FORMER MALDEN MGP SITE				
CLIENT				
NATIONAL GRID				
DRAWN	CHECKED	FILENAME	DATE	FIGURE
DMR	ML	NG MALDEN JULY 2010	7/14/10	<b>2</b>

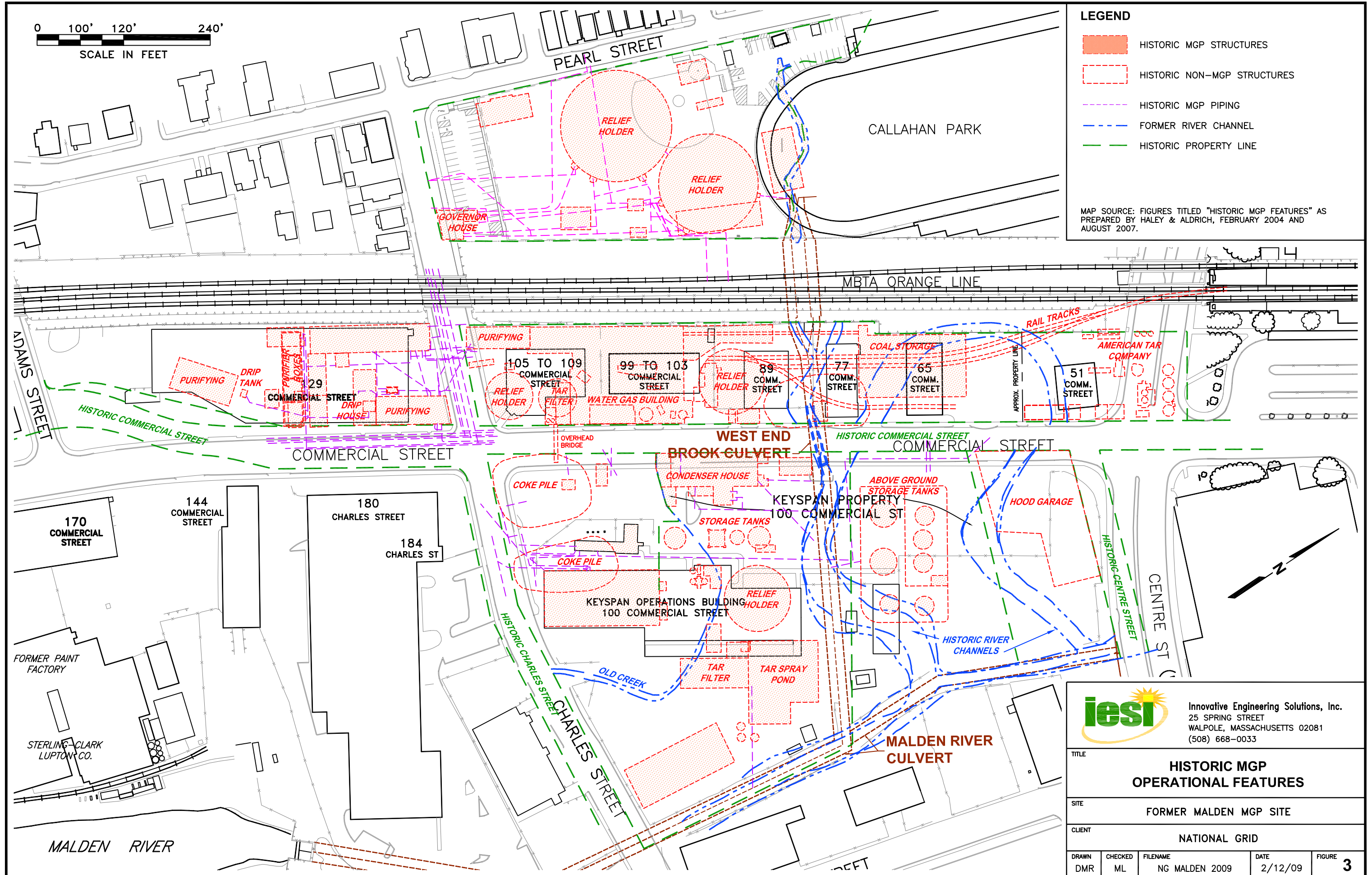


SCALE IN FEET

## LEGEND

- HISTORIC MGP STRUCTURES
- HISTORIC NON-MGP STRUCTURES
- HISTORIC MGP PIPING
- FORMER RIVER CHANNEL
- HISTORIC PROPERTY LINE

MAP SOURCE: FIGURES TITLED "HISTORIC MGP FEATURES" AS PREPARED BY HALEY & ALDRICH, FEBRUARY 2004 AND AUGUST 2007.



Innovative Engineering Solutions, Inc.  
25 SPRING STREET  
WALPOLE, MASSACHUSETTS 02081  
(508) 668-0033

TITLE <b>HISTORIC MGP OPERATIONAL FEATURES</b>				
SITE FORMER MALDEN MGP SITE				
CLIENT NATIONAL GRID				
DRAWN DMR	CHECKED ML	FILENAME NG MALDEN 2009	DATE 2/12/09	FIGURE <b>3</b>

## APPENDIX A

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### LABORATORY ANALYTICAL DATA REPORTS

Groundwater Analytical, Inc.  
P.O.Box 1200  
228 Main Street  
Buzzards Bay, MA 02532

Telephone: (508) 759-4441  
FAX: (508) 759-4475

**GROUNDWATER  
ANALYTICAL**

# e-mail

To:	Mike Lotti	From:	e-mail reporting GWA
	Innovative Engineering	Pages:	13
e-mail:	M.Lotti@IESIonline.com	Date:	07/02/2010 16:34:02
Re:	134384	CC:	
<input type="checkbox"/> Urgent	<input type="checkbox"/> For Review	<input type="checkbox"/> Please Comment	<input type="checkbox"/> Please Reply

● Comments:

Final Project Report for NG Malden 89 Commercial St./NG Malden T-1, Lab  
ID 134384, Received 06-14-10

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**Confidential**



July 2, 2010

Mr. Mike Lotti  
Innovative Engineering Solutions, Inc.  
25 Spring Street  
Walpole, MA 02081

## **LABORATORY REPORT**

Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Lab ID: **134384**  
Received: **06-14-10**

Dear Mike:

Enclosed are the analytical results for the above referenced project. The project was processed for Rush 3 Business Day turnaround.

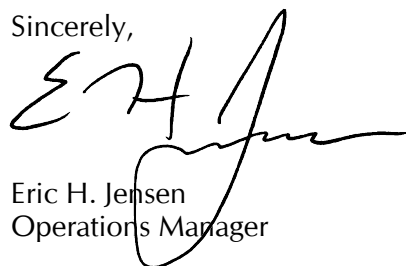
This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC or NVLAP standards, except as may be specifically noted, or described in the project narrative. The analytical results relate only to the samples received. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,



Eric H. Jensen  
Operations Manager

EHJ/elm  
Enclosures

### Sample Receipt Report

Project: **NG Malden 89 Commercial St./NG Malden T-1** Delivery: **Hand**  
 Client: **Innovative Engineering Solutions, Inc.** Airbill: **n/a**  
 Lab ID: **134384** Lab Receipt: **06-14-10**

Temperature: **2.7°C**  
 Chain of Custody: **Present**  
 Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
134384-1	Soil Composite		Soil	6/14/10 12:30	EPA 6010B TCLP Pb				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1257706	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a		

## Toxicity Characteristic Leaching Procedure (TCLP) Trace Metals

Field ID:	<b>Soil Composite</b>	Matrix:	<b>TCLP Leachate</b>
Project:	<b>NG Malden 89 Commercial St./NG Malden T-1</b>	Container:	<b>250 mL Amber Glass</b>
Client:	<b>Innovative Engineering Solutions, Inc.</b>	Preservation:	<b>Cool</b>
Laboratory ID:	<b>134384-1</b>	Date Leached:	<b>06-30-10 17:00</b>
Sampled:	<b>06-14-10 12:30</b>	TCLP Fluid:	<b>1</b>
Received:	<b>06-14-10 18:20</b>		

<u>Analysis Method</u>	<u>QC Batch ID</u>	<u>Prep Method</u>	<u>Prepared</u>	<u>Sample Volume</u>	<u>Instrument ID</u>	<u>Analyst</u>
EPA 6010B <sup>1</sup>	MB-4121-W	EPA 3010A	07-01-10 00:00	50 mL	ICP-1 PE 3000	LMS

CAS Number	Analyte	Concentration	Notes	Units	RCRA Limit	Reporting Limit	DF	Analyzed	Method
7439-92-1	Lead	BRL		mg/L	5.0	0.3	10	07-02-10 11:02	EPA 6010B <sup>1</sup>

**Method Reference:** Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised (1983), and Methods for the Determination of Metals in Environmental Samples, Supplement I, EPA-600/R-94-111, (1994), and 40 C.F.R. 136, Appendix C (1990).  
Sample leached in accordance with EPA Method 1311 prior to determinative analysis.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.  
RCRA Limit indicates maximum concentration of contaminant under the TCLP Rule, as specified at 40 C.F.R. 261.24, Table 1.  
DF Dilution Factor.

## TCLP Matrix Spike Trace Metals

Field ID:	<b>Soil Composite</b>	Parent Sample	Matrix Spike
Project:	<b>NG Malden 89 Commercial St./NG Malden T-1</b>	Laboratory ID: <b>134384-1</b>	<b>134384-1MS</b>
Client:	<b>Innovative Engineering Solutions, Inc.</b>	Sampled: <b>06-14-10 12:30</b>	<b>06-14-10 12:30</b>
Matrix:	<b>TCLP Leachate</b>	Received: <b>06-14-10 18:20</b>	<b>06-14-10 18:20</b>
Container:	<b>250 mL Amber Glass</b>	Leached: <b>06-30-10 17:00</b>	<b>06-30-10 17:00</b>
Preservation:	<b>Cool</b>	TCLP Fluid: <b>1</b>	<b>1</b>

<u>Method</u>	<u>QC Batch ID</u>	<u>Prep Method</u>	<u>Prepared</u>	<u>Volume</u>	<u>DF</u>	<u>Analyzed</u>	<u>Instrument ID</u>	<u>Analyst</u>
EPA 6010B	MB-4121-W	EPA 3010A	07-01-10 00:00	50 mL	10	07-02-10 11:10	ICP-1 PE 3000	LMS

CAS Number	Analyte	Unspiked Sample (mg/L)	MS Spiked (mg/L)	MS Measured (mg/L)	MS Recovery	QC Limits	Method
7439-92-1	Lead	BRL	5.0	4.8	93 %	75-125%	EPA 6010B

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample leached in accordance with EPA Method 1311 prior to determinative analysis.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.  
DF Dilution Factor.



### Project Narrative

Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Client: **Innovative Engineering Solutions, Inc.**

Lab ID: **134384**  
Received: **06-14-10 18:20**

#### A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

- 1 . Sample 134088-3 was reassigned laboratory number 134384-1 and analyzed for TCLP Lead on a 2 day turnaround per Mike Lotti, 6-29-10.

#### B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

- 1 . No method modifications, non-conformances or analytical issues were noted.



## Quality Assurance/Quality Control

### A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

### B. Definitions

**Batches** are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

**Laboratory Control Samples** are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

**Method Blanks** are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

**Surrogate Compounds** are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

**Quality Control Report  
Laboratory Control Samples**

Category: **Metals**  
Matrix: **Aqueous**  
Units: **mg/L**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 6010B	MB-4121-WL	EPA 3010A	07-01-10 00:00	07-02-10 10:54	ICP-1 PE 3000	JK
LCSD	EPA 6010B	MB-4121-WL	EPA 3010A	07-01-10 00:00	07-02-10 10:58	ICP-1 PE 3000	JK

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits		Method
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
7439-92-1	Lead	5.0	5.2	105%	5.0	5.0	100%	2 %	80-120 %	20 %	EPA 6010B

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.



**Quality Control Report  
Method Blank**

Category: **Metals**  
Matrix: **Aqueous**

<u>Analysis Method</u>	<u>QC Batch ID</u>	<u>Prep Method</u>	<u>Prepared</u>	<u>Sample Volume</u>	<u>Instrument ID</u>	<u>Analyst</u>
EPA 6010B	MB-4121-WB	EPA 3010A	07-01-10 00:00	50 mL	ICP-1 PE 3000	JK

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7439-92-1	Lead	BRL		mg/L	0.005	1	07-02-10 10:49	EPA 6010B

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.  
DF Dilution Factor.

## Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states. Copies of our current certificates may be obtained from our website:

<http://www.groundwateranalytical.com/qualifications.htm>

### CONNECTICUT

**Department of Health Services, PH-0586**

Potable Water, Wastewater, Solid Waste and Soil

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/Out\\_State.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/Out_State.pdf)

### MASSACHUSETTS

**Department of Environmental Protection, M-MA-103**

Potable Water and Non-Potable Water

<http://public.dep.state.ma.us/labcert/labcert.aspx>

**Department of Labor,**

Asbestos Analytical Services, Class A

**Division of Occupational Safety, AA000195**

[http://www.mass.gov/dos/forms/la-rpt\\_list\\_aa.pdf](http://www.mass.gov/dos/forms/la-rpt_list_aa.pdf)

### NEW HAMPSHIRE

**Department of Environmental Services, 202708**

Potable Water, Non-Potable Water, Solid and Chemical Materials

<http://www4.egov.nh.gov/DES/NHELAP>

### NEW YORK

**Department of Health, 11754**

Potable Water, Non-Potable Water, Solid and Hazardous Waste

<http://www.wadsworth.org/labcert/elap/comm.html>

### RHODE ISLAND

**Department of Health,**

Potable and Non-Potable Water Microbiology, Organic and Inorganic Chemistry

**Division of Laboratories, LAO00054**

<http://www.health.ri.gov/labs/outofstatelabs.pdf>

### U.S. DEPARTMENT OF AGRICULTURE

**USDA, Soil Permit, S-53921**

Foreign soil import permit

### VERMONT

**Department of Health, VT-87643**

Potable Water

[http://healthvermont.gov/enviro/ph\\_lab/water\\_test.aspx#cert](http://healthvermont.gov/enviro/ph_lab/water_test.aspx#cert)

## Certifications and Approvals

**MASSACHUSETTS**
**Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

**Potable Water (Drinking Water)**

Analyte	Method
1,2-Dibromo-3-Chloropropane	EPA 504.1
1,2-Dibromoethane	EPA 504.1
Alkalinity, Total	SM 2320-B
Antimony	EPA 200.8
Arsenic	EPA 200.8
Barium	EPA 200.7
Barium	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chlorine, Residual Free	SM 4500-CL-G
Chromium	EPA 200.7
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
E. Coli (Treatment and Distribution)	Enz. Sub. SM 9223
E. Coli (Treatment and Distribution)	NA-MUG SM 9222-G
Fecal Coliform (Source Water)	MF SM 9222-D
Fluoride	EPA 300.0
Fluoride	SM 4500-F-C
Heterotrophic Plate Count	SM 9215-B
Lead	EPA 200.8
Mercury	EPA 245.1
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Nitrite-N	EPA 300.0
Nitrite-N	Lachat 10-107-04-1-C
pH	SM 4500-H-B
Selenium	EPA 200.8
Silver	EPA 200.7
Silver	EPA 200.8
Sodium	EPA 200.7
Sulfate	EPA 300.0
Thallium	EPA 200.8
Total Coliform (Treatment and Distribution)	Enz. Sub. SM 9223
Total Coliform (Treatment and Distribution)	MF SM 9222-B
Total Dissolved Solids	SM 2540-C
Trihalomethanes	EPA 524.2
Turbidity	SM 2130-B
Volatile Organic Compounds	EPA 524.2

**Non-Potable Water (Wastewater)**

Analyte	Method
Aldrin	EPA 608
Alkalinity, Total	SM 2320-B
Alpha-BHC	EPA 608
Aluminum	EPA 200.7
Ammonia-N	Lachat 10-107-06-1-B

**Non-Potable Water (Wastewater)**

Analyte	Method
Antimony	EPA 200.7
Antimony	EPA 200.8
Arsenic	EPA 200.7
Arsenic	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Beta-BHC	EPA 608
Biochemical Oxygen Demand	SM 5210-B
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chemical Oxygen Demand	SM 5220-D
Chlordane	EPA 608
Chloride	EPA 300.0
Chlorine, Total Residual	SM 4500-CL-G
Chromium	EPA 200.7
Chromium	EPA 200.8
Cobalt	EPA 200.7
Cobalt	EPA 200.8
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
DDD	EPA 608
DDE	EPA 608
DDT	EPA 608
Delta-BHC	EPA 608
Dieldrin	EPA 608
Endosulfan I	EPA 608
Endosulfan II	EPA 608
Endosulfan Sulfate	EPA 608
Endrin	EPA 608
Endrin Aldehyde	EPA 608
Fluoride	EPA 300.0
Gamma-BHC	EPA 608
Hardness (CaCO <sub>3</sub> ), Total	EPA 200.7
Hardness (CaCO <sub>3</sub> ), Total	SM 2340-B
Heptachlor	EPA 608
Heptachlor Epoxide	EPA 608
Iron	EPA 200.7
Kjeldahl-N	Lachat 10-107-06-02-D
Lead	EPA 200.7
Magnesium	EPA 200.7
Manganese	EPA 200.7
Manganese	EPA 200.8
Mercury	EPA 245.1
Molybdenum	EPA 200.7
Molybdenum	EPA 200.8
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Non-Filterable Residue	SM 2540-D
Oil and Grease	EPA 1664

## Certifications and Approvals

**MASSACHUSETTS****Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

**Non-Potable Water (Wastewater)**

<b>Analyte</b>	<b>Method</b>
Orthophosphate	Lachat 10-115-01-1-A
pH	SM 4500-H-B
Phenolics, Total	EPA 420.4
Phenolics, Total	Lachat 10-210-00-1-B
Phosphorus, Total	Lachat 10-115-01-1-C
Phosphorus, Total	SM 4500-P-B,E
Polychlorinated Biphenyls (Oil)	EPA 600/4-81-045
Polychlorinated Biphenyls (Water)	EPA 608
Potassium	EPA 200.7
Selenium	EPA 200.7
Selenium	EPA 200.8
Silver	EPA 200.7
Sodium	EPA 200.7
Specific Conductivity	SM 2510-B
Strontium	EPA 200.7
Sulfate	EPA 300.0
SVOC-Acid Extractables	EPA 625
SVOC-Base/Neutral Extractables	EPA 625
Thallium	EPA 200.7
Thallium	EPA 200.8
Titanium	EPA 200.7
Total Dissolved Solids	SM 2540-C
Total Organic Carbon	SM 5310-B
Toxaphene	EPA 608
Vanadium	EPA 200.7
Vanadium	EPA 200.8
Volatile Aromatics	EPA 602
Volatile Aromatics	EPA 624
Volatile Halocarbons	EPA 624
Zinc	EPA 200.7
Zinc	EPA 200.8



Groundwater Analytical, Inc.  
P.O.Box 1200  
228 Main Street  
Buzzards Bay, MA 02532

Telephone: (508) 759-4441  
FAX: (508) 759-4475

**GROUNDWATER  
ANALYTICAL**

# e-mail

To:	Mike Lotti	From:	e-mail reporting GWA
	Innovative Engineering	Pages:	40
e-mail:	M.Lotti@IESIonline.com	Date:	07/02/2010 16:26:30
Re:	134088	CC:	

☐ Urgent      ☐ For Review      ☐ Please Comment      ☐ Please Reply

● Comments:

Final Project Report for NG Malden 89 Commercial St./NG Malden T-1, Lab  
ID 134088, Received 06-15-10

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**Confidential**

July 2, 2010

Mr. Mike Lotti  
Innovative Engineering Solutions, Inc.  
25 Spring Street  
Walpole, MA 02081

## **LABORATORY REPORT**

Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Lab ID: **134088**  
Received: **06-15-10**

Dear Mike:

Enclosed are the analytical results for the above referenced project. The project was processed for Standard turnaround.

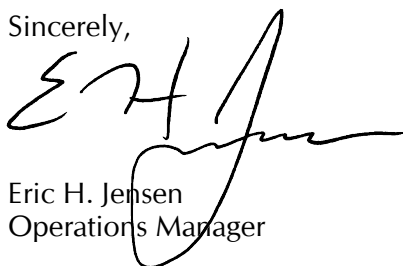
This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC or NVLAP standards, except as may be specifically noted, or described in the project narrative. The analytical results relate only to the samples received. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,



Eric H. Jensen  
Operations Manager

EHJ/elm  
Enclosures

## Sample Receipt Report

Project: **NG Malden 89 Commercial St./NG Malden T-1** Delivery: **GWA Courier**  
 Client: **Innovative Engineering Solutions, Inc.** Airbill: **n/a**  
 Lab ID: **134088** Lab Receipt: **06-15-10**

Temperature: **2.7°C**  
 Chain of Custody: **Present**  
 Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
134088-1	Soil Composite		Soil	6/14/10 12:30	EPA 8260B Volatile Organics with Oxygenates				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C903581	40 mL VOA Vial	Proline	BX25486	Methanol	R-5231AM	03-29-07	06-26-07		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
134088-2	Soil Composite		Soil	6/14/10 12:30	MA DEP VPH Carbon Ranges Only				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C970781	40 mL VOA Vial	Proline	BX27060	Methanol	R-5231M	06-15-07	06-26-07		

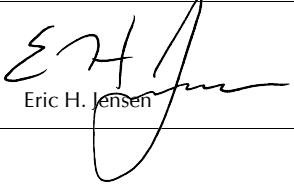
Lab ID	Field ID		Matrix	Sampled	Method				Notes
134088-3	Soil Composite		Soil	6/14/10 12:30	EPA 6010B/7471A 8 RCRA Metals EPA 8082 PCBs EPA 8270C Semivolatile Organics MA DEP EPH Carbon Ranges Only EPA 9045C Corrosivity MA DEP Protocol Physiologically Available Cyanide EPA 9012A Total Cyanide EPA 1010 Mod Ignitability EPA SW-846, Chp. 7 Reactivity				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1104091	250 mL Amber Glass	Proline	BX31658	None	n/a	n/a	n/a		
C1104085	250 mL Amber Glass	Proline	BX31658	None	n/a	n/a	n/a		
C1104084	250 mL Amber Glass	Proline	BX31658	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
134088-4	Soil Composite		Soil	6/14/10 12:30	Percent Sulfur				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1268440	120 mL Amber Glass	Scientific Specialist	BX36656	None	n/a	n/a	n/a		

## Data Certification

Project: NG Malden 89 Commercial St./NG Malden T-1  
Client: Innovative Engineering Solutions, Inc.

Lab ID: 134088  
Received: 06-15-10 18:20

MA DEP Compendium of Analytical Methods						
Project Location:		n/a		MA DEP RTN:		n/a
This Form provides certifications for the following data set:						
EPA 8260B:	134088-1					
EPA 8270C:	134088-3					
EPA 8082:	134088-3					
MA DEP VPH:	134088-2					
MA DEP EPH:	134088-3					
EPA 6010B:	134088-3					
EPA 7470A/1A:	134088-3					
EPA 9012A:	134088-3					
Sample Matrices:		Groundwater ( )	Soil/Sediment (X)	Drinking Water ( )	Other ( )	
MCP SW-846	8260B (X)	8151A ( )	8330 ( )	6010B (X)	7470A/1A (X)	
Methods Used	8270C (X)	8081A ( )	VPH (X)	6020A ( )	9012A <sup>2</sup> (X)	
As specified in MA DEP Compendium of Analytical Methods. (check all that apply)	8082 (X)	8021B ( )	EPH (X)	7000 S <sup>3</sup> ( )	Other ( )	
	1. List Release Tracking Number (RTN), if known.					
	2. SW-846 Method 9012A (Equivalent to 9014) or MA DEP Physiologically Available Cyanide (PAC) Method					
	3. S - SW-846 Methods 7000 Series. List individual method and analyte.					
An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status.						
A.	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?					Yes
B.	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?					Yes
C.	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty," as described in Section 2.0 of the MA DEP document CAM VII A, <i>Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data</i> ?					Yes
D.	<u>VPH and EPH methods only</u> : Was the VPH or EPH method run without significant modifications, as specified in Section 11.3?					Yes
A response to questions E and F below is required for "Presumptive Certainty" status.						
E.	Were all QC performance standards and recommendations for the specified methods achieved?					No
F.	Were results for all analyte-list compounds/elements for the specified method(s) reported?					No
All No answers are addressed in the attached Project Narrative.						
I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.						
Signature:				Position:		Operations Manager
Printed Name:		Eric H. Jensen		Date:		07-02-10

## EPA Method 8260B Volatile Organics by GC/MS

Field ID: **Soil Composite**  
Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Client: **Innovative Engineering Solutions, Inc.**  
  
Laboratory ID: **134088-1**  
Sampled: **06-14-10 12:30**  
Received: **06-15-10 18:20**  
Analyzed: **06-22-10 14:59**  
Analyst: **LMG**

Matrix: **Soil**  
Container: **40 mL VOA Vial**  
Preservation: **Methanol/ Cool**  
  
QC Batch ID: **VM1-2854-E**  
Instrument ID: **MS-1 HP 5890**  
Sample Weight: **8.4 g**  
Final Volume: **15 mL**  
% Solids: **86**  
Dilution Factor: **1**

Page: 1 of 2

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/Kg	1,000
74-87-3	Chloromethane	BRL		ug/Kg	1,000
75-01-4	Vinyl Chloride	BRL		ug/Kg	1,000
74-83-9	Bromomethane	BRL		ug/Kg	1,000
75-00-3	Chloroethane	BRL		ug/Kg	1,000
75-69-4	Trichlorofluoromethane	BRL		ug/Kg	1,000
60-29-7	Diethyl Ether	BRL		ug/Kg	1,000
75-35-4	1,1-Dichloroethene	BRL		ug/Kg	520
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/Kg	5,200
67-64-1	Acetone	BRL		ug/Kg	5,200
75-15-0	Carbon Disulfide	BRL		ug/Kg	5,200
75-09-2	Methylene Chloride	BRL		ug/Kg	2,100
107-13-1	Acrylonitrile	BRL		ug/Kg	520
156-60-5	<i>trans</i> - 1,2-Dichloroethene	BRL		ug/Kg	520
1634-04-4	Methyl <i>tert</i> - butyl Ether (MTBE)	BRL		ug/Kg	520
75-34-3	1,1-Dichloroethane	BRL		ug/Kg	520
594-20-7	2,2-Dichloropropane	BRL		ug/Kg	520
156-59-2	<i>cis</i> - 1,2-Dichloroethene	BRL		ug/Kg	520
78-93-3	2-Butanone (MEK)	BRL		ug/Kg	5,200
74-97-5	Bromochloromethane	BRL		ug/Kg	520
109-99-9	Tetrahydrofuran (THF)	BRL		ug/Kg	5,200
67-66-3	Chloroform	BRL		ug/Kg	520
71-55-6	1,1,1-Trichloroethane	BRL		ug/Kg	520
56-23-5	Carbon Tetrachloride	BRL		ug/Kg	520
563-58-6	1,1-Dichloropropene	BRL		ug/Kg	520
71-43-2	Benzene	750		ug/Kg	520
107-06-2	1,2-Dichloroethane	BRL		ug/Kg	520
79-01-6	Trichloroethene	BRL		ug/Kg	520
78-87-5	1,2-Dichloropropane	BRL		ug/Kg	520
74-95-3	Dibromomethane	BRL		ug/Kg	520
75-27-4	Bromodichloromethane	BRL		ug/Kg	520
123-91-1	1,4-Dioxane	BRL		ug/Kg	520,000
10061-01-5	<i>cis</i> - 1,3-Dichloropropene	BRL		ug/Kg	520
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/Kg	5,200
108-88-3	Toluene	BRL		ug/Kg	520
10061-02-6	<i>trans</i> - 1,3-Dichloropropene	BRL		ug/Kg	520
79-00-5	1,1,2-Trichloroethane	BRL		ug/Kg	520
127-18-4	Tetrachloroethene	BRL		ug/Kg	520
142-28-9	1,3-Dichloropropane	BRL		ug/Kg	520
591-78-6	2-Hexanone	BRL		ug/Kg	5,200
124-48-1	Dibromochloromethane	BRL		ug/Kg	520
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	520
108-90-7	Chlorobenzene	BRL		ug/Kg	520
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/Kg	520
100-41-4	Ethylbenzene	BRL		ug/Kg	520
108-38-3/106-42-3	<i>meta</i> - Xylene and <i>para</i> - Xylene	BRL		ug/Kg	520

## EPA Method 8260B Volatile Organics by GC/MS

Field ID: **Soil Composite**  
Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Client: **Innovative Engineering Solutions, Inc.**  
Laboratory ID: **134088-1**  
Sampled: **06-14-10 12:30**  
Received: **06-15-10 18:20**  
Analyzed: **06-22-10 14:59**  
Analyst: **LMG**

Matrix: **Soil**  
Container: **40 mL VOA Vial**  
Preservation: **Methanol/ Cool**  
QC Batch ID: **VM1-2854-E**  
Instrument ID: **MS-1 HP 5890**  
Sample Weight: **8.4 g**  
Final Volume: **15 mL**  
% Solids: **86**  
Dilution Factor: **1**

Page: 1 of 2

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
95-47-6	ortho-Xylene	BRL		ug/Kg	520
100-42-5	Styrene	BRL		ug/Kg	520
75-25-2	Bromoform	BRL		ug/Kg	520
98-82-8	Isopropylbenzene	BRL		ug/Kg	520
108-86-1	Bromobenzene	BRL		ug/Kg	520
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/Kg	520
96-18-4	1,2,3-Trichloropropane	BRL		ug/Kg	520
110-57-6	trans-1,4-Dichloro-2-butene	BRL		ug/Kg	5,200
103-65-1	n-Propylbenzene	BRL		ug/Kg	520
95-49-8	2-Chlorotoluene	BRL		ug/Kg	520
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/Kg	520
106-43-4	4-Chlorotoluene	BRL		ug/Kg	520
98-06-6	tert-Butylbenzene	BRL		ug/Kg	520
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/Kg	520
135-98-8	sec-Butylbenzene	BRL		ug/Kg	520
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	520
99-87-6	4-Isopropyltoluene	BRL		ug/Kg	520
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	520
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	520
104-51-8	n-Butylbenzene	BRL		ug/Kg	520
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/Kg	520
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/Kg	520
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	520
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	520
91-20-3	Naphthalene	580		ug/Kg	520
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/Kg	520
75-65-0	tert-Butyl Alcohol (TBA)	BRL		ug/Kg	21,000
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/Kg	520
637-92-3	Ethyl tert-butyl Ether (ETBE)	BRL		ug/Kg	520
994-05-8	tert-Amyl Methyl Ether (TAME)	BRL		ug/Kg	520

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	2,500	2,600	103 %	70 - 130 %
1,2-Dichloroethane-d <sub>4</sub>	2,500	2,400	98 %	70 - 130 %
Toluene-d <sub>8</sub>	2,500	2,700	109 %	70 - 130 %
4-Bromofluorobenzene	2,500	2,800	114 %	70 - 130 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample preparation performed by EPA Method 5035A and EPA Method 5030B. Results are reported on a dry weight basis.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.



## Massachusetts DEP VPH Method Volatile Petroleum Hydrocarbons by GC/PID/FID

Field ID:	Soil Composite	Matrix:	Soil
Project:	NG Malden 89 Commercial St./NG Malden T-1	Container:	40 mL VOA Vial
Client:	Innovative Engineering Solutions, Inc.	Preservation:	Methanol/ Cool
Laboratory ID:	134088-02	QC Batch ID:	VP-1678-E
Sampled:	06-14-10 12:30	Instrument ID:	GC-1 HP 5890
Received:	06-15-10 18:20	Sample Weight:	11 g
Analyzed:	06-25-10 21:36	Final Volume:	15 mL
Analyst:	TRA	% Solids:	86
		Dilution Factor:	1

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons <sup>†</sup> <sup>◇</sup>	2.2		mg/Kg	1.8
n-C9 to n-C12 Aliphatic Hydrocarbons <sup>†</sup> <sup>⊗</sup>	3.2		mg/Kg	1.8
n-C9 to n-C10 Aromatic Hydrocarbons <sup>†</sup>	2.8		mg/Kg	1.8
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons <sup>†</sup>	3.6		mg/Kg	1.8
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons <sup>†</sup>	7.3		mg/Kg	1.8

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	4.6	5.1	111 %	70 - 130 %
2,5-Dibromotoluene (FID)	4.6	5.2	113 %	70 - 130 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

**Method Reference:** Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).  
Results are reported on a dry weight basis.

**Report Notations:**

- BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
- † Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
- ◇ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.
- ⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.
- ⌵ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.
- ‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

**Massachusetts DEP EPH Method  
Extractable Petroleum Hydrocarbons by GC/FID**

Field ID:	<b>Soil Composite</b>	Matrix:	<b>Soil</b>
Project:	<b>NG Malden 89 Commercial St./NG Malden T-1</b>	Container:	<b>250 mL Amber Glass</b>
Client:	<b>Innovative Engineering Solutions, Inc.</b>	Preservation:	<b>Cool</b>
Laboratory ID:	<b>134088-3</b>	QC Batch ID:	<b>EP-3124-M</b>
Sampled:	<b>06-14-10 12:30</b>	Instrument ID:	<b>GC-7 HP 5890</b>
Received:	<b>06-15-10 18:20</b>	Sample Weight:	<b>15 g</b>
Extracted:	<b>06-28-10 19:30</b>	Final Volume:	<b>1 mL</b>
Analyzed (AL):	<b>06-30-10 04:50</b>	% Solids:	<b>86</b>
Analyzed (AR):	<b>06-30-10 05:34</b>	Aliphatic Dilution Factor:	<b>1</b>
Analyst:	<b>KM</b>	Aromatic Dilution Factor:	<b>1</b>

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons <sup>†</sup>	BRL		mg/Kg	34
n-C19 to n-C36 Aliphatic Hydrocarbons <sup>†</sup>	<b>64</b>		mg/Kg	34
n-C11 to n-C22 Aromatic Hydrocarbons <sup>†</sup> <sup>◇</sup>	<b>340</b>		mg/Kg	34
<u>Unadjusted</u> n-C11 to n-C22 Aromatic Hydrocarbons <sup>†</sup>	410		mg/Kg	34

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation:				
2-Fluorobiphenyl	3.0	2.2	<b>72 %</b>	40 - 140 %
2-Bromonaphthalene	3.0	2.3	<b>76 %</b>	40 - 140 %
Extraction:				
Chloro-octadecane	3.0	1.7	<b>58 %</b>	40 - 140 %
<i>ortho</i> -Terphenyl	3.0	3.2	<b>105 %</b>	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

**Method Reference:** Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).  
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.  
<sup>†</sup> Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.  
<sup>◇</sup> n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

## EPA Method 8082 Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	Soil Composite	Matrix:	Soil
Project:	NG Malden 89 Commercial St./NG Malden T-1	Container:	250 mL Amber Glass
Client:	Innovative Engineering Solutions, Inc.	Preservation:	Cool
Laboratory ID:	134088-03	QC Batch ID:	PB-3469-P
Sampled:	06-14-10 12:30	Instrument ID:	GC-13 Agilent 6890
Received:	06-15-10 18:20	Sample Weight:	16 g
Extracted:	06-22-10 19:00	Final Volume:	1 mL
Cleaned Up:	06-25-10 21:30	Percent Solids:	86
Analyzed:	06-26-10 16:50	Dilution Factor:	1
Analyst:	CRL		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	90
11104-28-2	Aroclor 1221	BRL		ug/Kg	90
11141-16-5	Aroclor 1232	BRL		ug/Kg	90
53469-21-9	Aroclor 1242	BRL		ug/Kg	90
12672-29-6	Aroclor 1248	BRL		ug/Kg	90
11097-69-1	Aroclor 1254	BRL		ug/Kg	90
11096-82-5	Aroclor 1260	BRL		ug/Kg	90
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	90
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	90

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro- <i>m</i> -xylene	15	8	55 %	30 - 150 %
	Decachlorobiphenyl	15	14	93 %	30 - 150 %
Second Column	Tetrachloro- <i>m</i> -xylene	15	9	58 %	30 - 150 %
	Decachlorobiphenyl	15	14	94 %	30 - 150 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample extraction performed by EPA Method 3545. Cleanup performed by EPA Method 3660B and EPA Method 3665A.  
Results are reported on a dry weight basis.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

## EPA Method 8270C Semivolatile Organics by GC/MS

Field ID: **Soil Composite**  
Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Client: **Innovative Engineering Solutions, Inc.**  
  
Laboratory ID: **134088-03**  
Sampled: **06-14-10 12:30**  
Received: **06-15-10 18:20**  
Extracted: **06-29-10 11:00**  
Analyzed: **06-30-10 22:23**  
Analyst: **MJB**

Matrix: **Soil**  
Container: **250 mL Amber Glass**  
Preservation: **Cool**  
  
QC Batch ID: **SV-2361-P**  
Instrument ID: **MS-12 Agilent 6890**  
Sample Weight: **16 g**  
Final Volume: **1 mL**  
Percent Solids: **86**  
Dilution Factor: **5**

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CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
62-75-9	N-Nitrosodimethylamine	BRL		ug/Kg	1,900
110-86-1	Pyridine	BRL		ug/Kg	1,900
108-95-2	Phenol	BRL		ug/Kg	1,900
62-53-3	Aniline	BRL		ug/Kg	1,900
111-44-4	Bis(2-chloroethyl) ether	BRL		ug/Kg	1,900
95-57-8	2-Chlorophenol	BRL		ug/Kg	1,900
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	1,900
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	1,900
100-51-6	Benzyl Alcohol	BRL		ug/Kg	3,800
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	1,900
95-48-7	2-Methylphenol	BRL		ug/Kg	1,900
108-60-1	Bis(2-chloroisopropyl) ether	BRL		ug/Kg	1,900
108-39-4/106-44-5	3 and 4-Methylphenol *	BRL		ug/Kg	1,900
621-64-7	N-Nitrosodi-n-propylamine	BRL		ug/Kg	1,900
98-86-2	Acetophenone	BRL		ug/Kg	1,900
67-72-1	Hexachloroethane	BRL		ug/Kg	1,900
98-95-3	Nitrobenzene	BRL		ug/Kg	1,900
78-59-1	Isophorone	BRL		ug/Kg	1,900
88-75-5	2-Nitrophenol	BRL		ug/Kg	1,900
105-67-9	2,4-Dimethylphenol	BRL		ug/Kg	1,900
111-91-1	Bis(2-chloroethoxy) methane	BRL		ug/Kg	1,900
120-83-2	2,4-Dichlorophenol	BRL		ug/Kg	1,900
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	1,900
91-20-3	Naphthalene	BRL		ug/Kg	1,900
106-47-8	4-Chloroaniline	BRL		ug/Kg	1,900
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	1,900
59-50-7	4-Chloro-3-methylphenol	BRL		ug/Kg	1,900
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	1,900
77-47-4	Hexachlorocyclopentadiene	BRL		ug/Kg	3,800
88-06-2	2,4,6-Trichlorophenol	BRL		ug/Kg	1,900
95-95-4	2,4,5-Trichlorophenol	BRL		ug/Kg	1,900
91-58-7	2-Chloronaphthalene	BRL		ug/Kg	1,900
88-74-4	2-Nitroaniline	BRL		ug/Kg	1,900
100-25-4	1,4-Dinitrobenzene	BRL		ug/Kg	1,900
131-11-3	Dimethyl phthalate	BRL		ug/Kg	1,900
99-65-0	1,3-Dinitrobenzene	BRL		ug/Kg	1,900
208-96-8	Acenaphthylene	2,600		ug/Kg	1,900
606-20-2	2,6-Dinitrotoluene	BRL		ug/Kg	1,900
528-29-0	1,2-Dinitrobenzene	BRL		ug/Kg	1,900
99-09-2	3-Nitroaniline	BRL		ug/Kg	1,900
83-32-9	Acenaphthene	BRL		ug/Kg	1,900
51-28-5	2,4-Dinitrophenol	BRL		ug/Kg	3,800
100-02-7	4-Nitrophenol	BRL		ug/Kg	1,900
132-64-9	Dibenzofuran	BRL		ug/Kg	1,900
121-14-2	2,4-Dinitrotoluene	BRL		ug/Kg	1,900

## EPA Method 8270C (Continued) Semivolatile Organics by GC/MS

Field ID: **Soil Composite**  
Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Client: **Innovative Engineering Solutions, Inc.**  
  
Laboratory ID: **134088-03**  
Sampled: **06-14-10 12:30**  
Received: **06-15-10 18:20**  
Extracted: **06-29-10 11:00**  
Analyzed: **06-30-10 22:23**  
Analyst: **MJB**

Matrix: **Soil**  
Container: **250 mL Amber Glass**  
Preservation: **Cool**  
  
QC Batch ID: **SV-2361-P**  
Instrument ID: **MS-12 Agilent 6890**  
Sample Weight: **16 g**  
Final Volume: **1 mL**  
Dilution Factor: **5**

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CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
84-66-2	Diethyl phthalate	BRL		ug/Kg	1,900
7005-72-3	4-Chlorophenyl phenyl ether	BRL		ug/Kg	1,900
86-73-7	Fluorene	BRL		ug/Kg	1,900
100-01-6	4-Nitroaniline	BRL		ug/Kg	1,900
534-52-1	4,6-Dinitro-2-methylphenol	BRL		ug/Kg	1,900
86-30-6	N-Nitrosodiphenylamine <sup>†</sup>	BRL		ug/Kg	1,900
122-66-7	1,2-Diphenylhydrazine <sup>◇</sup>	BRL		ug/Kg	1,900
101-55-3	4-Bromophenyl phenyl ether	BRL		ug/Kg	1,900
118-74-1	Hexachlorobenzene	BRL		ug/Kg	1,900
87-86-5	Pentachlorophenol	BRL		ug/Kg	1,900
85-01-8	Phenanthrene	8,400		ug/Kg	1,900
120-12-7	Anthracene	2,700		ug/Kg	1,900
86-74-8	Carbazole	BRL		ug/Kg	1,900
84-74-2	Di-n-butyl phthalate	BRL		ug/Kg	1,900
206-44-0	Fluoranthene	26,000		ug/Kg	1,900
129-00-0	Pyrene	24,000		ug/Kg	1,900
85-68-7	Butyl benzyl phthalate	BRL		ug/Kg	1,900
91-94-1	3,3'-Dichlorobenzidine	BRL		ug/Kg	1,900
56-55-3	Benzo[a]anthracene	13,000		ug/Kg	1,900
218-01-9	Chrysene	12,000		ug/Kg	1,900
117-81-7	Bis(2-ethylhexyl) phthalate	BRL		ug/Kg	1,900
117-84-0	Di-n-octyl phthalate	BRL		ug/Kg	1,900
205-99-2	Benzo[b]fluoranthene	19,000		ug/Kg	1,900
207-08-9	Benzo[k]fluoranthene	6,500		ug/Kg	1,900
50-32-8	Benzo[a]pyrene	14,000		ug/Kg	1,900
193-39-5	Indeno[1,2,3-c,d]pyrene	8,800		ug/Kg	1,900
53-70-3	Dibenzo[a,h]anthracene	2,200		ug/Kg	1,900
191-24-2	Benzo[g,h,i]perylene	7,400		ug/Kg	1,900

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	15,000	8,900	59 %	30 - 130 %
Phenol-d5	15,000	9,600	64 %	30 - 130 %
Nitrobenzene-d5	7,500	4,900	65 %	30 - 130 %
2-Fluorobiphenyl	7,500	5,100	68 %	30 - 130 %
2,4,6-Tribromophenol	15,000	9,200	61 %	30 - 130 %
Terphenyl-d14	7,500	4,400	59 %	30 - 130 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample extraction performed by EPA Method 3545. Results are reported on a dry weight basis.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

\* Analyzed as 4-Methylphenol.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◇ Analyzed as Azobenzene.

## Inorganic Chemistry

Field ID: **Soil Composite**

Matrix: **Soil**

Project: **NG Malden 89 Commercial St./NG Malden T-1**

Received: **06-15-10 18:20**

Client: **Innovative Engineering Solutions, Inc.**

Lab ID: **134088-03**    Sampled: **06-14-10 12:30**    % Solids: **86**    Container: **250 mL Amber Glass**    Preservation: **Cool**

Analyte	Result	Units	RL	DF	Weight	Analyzed	QC Batch	Method	Inst	Analyst
Cyanide, Total	5	mg/Kg	1	116	0.0043 g	06-24-10 11:36	TCN-1579-S	EPA 9012A	1	JR
Cyanide, Physiologically Available	BRL	mg/Kg	1	116	0.0043 g	06-29-10 10:20	PCN-0554-S	MA DEP Protocol	1	JR
Corrosivity (as pH)	7.3	pH	NA	1	20 g	06-28-10 14:00	PH-1071-S	EPA 9045C	3	JK
Ignitability (as Flashpoint)	> 165	°F	70	1	100 g	06-28-10 14:00	FP-1070-S	EPA 1010 Mod	4	JK
Reactive Cyanide	BRL	mg/Kg	50	1	10 g	06-28-10 14:00	RC-0960-S	SW-846 Chp. 7.3.3	2	JK
Reactive Sulfide	BRL	mg/Kg	100	1	10 g	06-28-10 14:00	RS-0960-S	SW-846 Chp. 7.3.4	n/a	JK

**Method Reference:** Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Results are reported on a dry weight basis.

**Report Notations:**

- BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
- RL Reporting Limit.
- DF Dilution Factor.
- 1 Instrument ID: Lachat 8000 Autoanalyzer
- 2 Instrument ID: Milton Roy Spectronic 401
- 3 Instrument ID: Accumet AR50
- 4 Instrument ID: Boekel 152800 Flash Point Tester



## Trace Metals

Field ID: **Soil Composite** Matrix: **Soil**  
 Project: **NG Malden 89 Commercial St./NG Malden T-1** Container: **250 mL Amber Glass**  
 Client: **Innovative Engineering Solutions, Inc.** Preservation: **Cool**  
 Laboratory ID: **134088-3** Percent Solids: **86**  
 Sampled: **06-14-10 12:30**  
 Received: **06-15-10 18:20**

<u>Analysis Method</u>	<u>QC Batch ID</u>	<u>Prep Method</u>	<u>Prepared</u>	<u>Sample Weight</u>	<u>Instrument ID</u>	<u>Analyst</u>
EPA 6010B <sup>1</sup>	MB-01860-S	EPA 3050B	06-22-10 00:00	0.498 g	ICP-1 PE 3000	LS
EPA 7471A <sup>2</sup>	MP-2564-S	EPA 7471A	06-22-10 00:00	0.6 g	CVAA-1 PE FIMS	MP

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-38-2	Arsenic, Total	7.1		mg/Kg	3.5	1	06-22-10 21:19	EPA 6010B <sup>1</sup>
7440-39-3	Barium, Total	62		mg/Kg	5.9	1	06-22-10 21:19	EPA 6010B <sup>1</sup>
7440-43-9	Cadmium, Total	1.1		mg/Kg	0.59	1	06-22-10 21:19	EPA 6010B <sup>1</sup>
7440-47-3	Chromium, Total	14		mg/Kg	1.2	1	06-22-10 21:19	EPA 6010B <sup>1</sup>
7439-92-1	Lead, Total	220		mg/Kg	5.9	1	06-22-10 21:19	EPA 6010B <sup>1</sup>
7439-97-6	Mercury, Total	0.34		mg/Kg	0.019	1	06-23-10 16:58	EPA 7471A <sup>2</sup>
7782-49-2	Selenium, Total	BRL		mg/Kg	5.9	1	06-22-10 21:19	EPA 6010B <sup>1</sup>
7440-22-4	Silver, Total	BRL		mg/Kg	1.2	1	06-22-10 21:19	EPA 6010B <sup>1</sup>

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
 Results are reported on a dry weight basis.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.  
 DF Dilution Factor.

Sample		Source		Taken/Time		Received	
23303	134088-4A Soil Comp	Groundwater Analytical		6/14/10		6/22/10	
Parameter		Results		MDL	Method	Analyzed/Time	Tech
Sulfur, %		Less Than	0.20	0.20	ASTM D-4239	06/24/10	sjr

## Project Narrative

Project: **NG Malden 89 Commercial St./NG Malden T-1**  
Client: **Innovative Engineering Solutions, Inc.**

Lab ID: **134088**  
Received: **06-15-10 18:20**

### A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1. No documentation discrepancies, changes, or amendments were noted.

### B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1. EPA 6010B Note: Sample 134088-3. Sample was analyzed for selected target analytes, as requested by client.
2. EPA 8270C Note: Sample 134088-3. Sample was diluted prior to analysis. Dilution was required to keep all target analytes within calibration.
3. MA DEP EPH Note: Sample 134088-3. Sample was analyzed for only carbon range analytes, as requested by client.
4. MA DEP VPH Note: Sample 134088-2 was received with greater than 25% difference between sample weight and methanol. The sample was analyzed as received.
5. MA DEP VPH Note: Sample 134088-2. Sample was analyzed for only carbon range analytes, as requested by client.
6. EPA 8260B Non-conformance: Laboratory control sample (LCS) analyte 1,1,2-Trichlorotrifluoroethane was above recommended recovery limits for QC batch VM1-2854-E.
7. EPA 8260B Non-conformance: Laboratory control sample (LCS) analytes Methylene Chloride and cis-1,2-Dichloroethene had RPD recoveries outside recommended recovery limits for QC batch VM1-2854-E.

# GROUNDWATER ANALYTICAL

228 Main Street, P.O. Box 1200  
Buzards Bay, MA 02532  
Telephone (508) 759-4441 • FAX (508) 759-4475  
www.groundwateranalytical.com

## CHAIN-OF-CUSTODY RECORD AND WORK ORDER

Project Name: **NG Malden**  
Project Number: **89 Commercial St**  
Address: **25 Spring St.**  
City/State/Zip: **Malden, MA 02081**  
Sampler Name: **Darren Rolis**  
Project Manager: **Mike Lotti**  
Telephone: **508-668-0033**

**TURNAROUND**

☒ 10 Business Days  
☐ 5 Business Days  
☐ RUSH (RAN - Rush requires Rush Authorization Number)  
Please Email to: **mlott@esolionline.com**  
☐ Please FAX to:

**BILLING**

Purchase Order No.: **NG Malden T-1**  
Third Party Billing: ☐  
GWA Quote: ☐

INSTRUCTIONS: Use separate line for each container (except replicates).

Sampling	DATE	TIME	SAMPLE IDENTIFICATION	Matrix		Type	Container(s)	Preservation		Filtration	LABORATORY NUMBER (Lab Use Only)
				Matrix	Type			Preservation	Filtration		
6/14/03	1330		Soil Composite	GROUNDWATER	OTHER SOLID	GRAV	120mL/8 oz Glass	120mL/8 oz Plastic	120mL/8 oz Plastic	120mL/8 oz Plastic	120mL/8 oz Plastic
				DRINKING WATER	WASTEWATER	GRAV	500mL/16 oz Glass	500mL/16 oz Plastic	500mL/16 oz Plastic	500mL/16 oz Plastic	500mL/16 oz Plastic
				WASTEWATER	OTHER SOLID	GRAV	120mL/8 oz Glass	120mL/8 oz Plastic	120mL/8 oz Plastic	120mL/8 oz Plastic	120mL/8 oz Plastic
				GROUNDWATER	OTHER SOLID	GRAV	500mL/16 oz Glass	500mL/16 oz Plastic	500mL/16 oz Plastic	500mL/16 oz Plastic	500mL/16 oz Plastic

**REMARKS / SPECIAL INSTRUCTIONS**

☒ YES ☐ NO MCP Data Certification required.  
☐ YES ☒ NO MCP Drinking Water Sample Included.  
(Volatile analyses require duplicate collection and Trip Blanks).  
☐ Analyze Duplicates and Trip Blanks only if positive results.

**DATA QUALITY OBJECTIVES**

**Regulatory Program**

State: ☐ CT ☐ ME ☒ MA ☐ NH ☐ NY ☐ RI ☐ VT

Standard: ☐ MCP GW-1/S-1 ☐ PWS Form ☒ MCP GW-2/S-2 ☐ MWFA ☐ NY STARS ☐ Drinking Water ☐ Wastewater ☐ Waste Disposal ☐ Dredge Material

**Project Specific QC**

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. **Each MS, MSD and Sample Duplicate requires an additional sample aliquot.**

**Project Specific QC Required**

Selection of QC Sample  
☐ Sample Duplicate  
☐ Matrix Spike  
☐ Matrix Spike Duplicate

**CHAIN-OF-CUSTODY RECORD**

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

Relinquished by Sample: **Janet Doe** Date: **6/15/03** Time: **1300**  
Received by: **YCH** Date: **6/15/03** Time: **1329**  
Relinquished by: **YCH** Date: **6/15/03** Time: **1320**  
Received by: **YCH** Date: **6/15/03** Time: **1320**

Method of Shipment: ☒ GWA Courier ☐ Express Mail ☐ Federal Express  
Shipping/Airbill Number: **1329**  
Custody Seal Number: **2.7**

Run one for disposal Call Mike Lotti w/ questions 774-270-0834

## Quality Assurance/Quality Control

### A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

### B. Definitions

**Batches** are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

**Laboratory Control Samples** are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

**Method Blanks** are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

**Surrogate Compounds** are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

## Quality Control Report Laboratory Control Samples

Category:	MA DEP EPH Method	LCS	Instrument ID:	GC-9 Agilent 6890	LCSD	Instrument ID:	GC-9 Agilent 6890
QC Batch ID:	EP-3124-M	Extracted:	06-28-10 19:30	Extracted:	06-28-10 19:30	Analyzed (AL):	06-30-10 13:52
Matrix:	Soil	Analyzed (AR):	06-30-10 13:09	Analyzed (AR):	06-30-10 14:36	Analyst:	KM
Units:	mg/Kg	Analyst:	KM	Analyst:	KM		

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
111-84-2	n-Nonane (C <sub>9</sub> )	3.3	1.1	34 %	3.3	1.2	36 %	6 %	30 - 140 %	25%
124-18-5	n-Decane (C <sub>10</sub> )	3.3	1.3	40 %	3.3	1.4	43 %	8 %	40 - 140 %	25%
112-40-3	n-Dodecane (C <sub>12</sub> )	3.3	1.5	45 %	3.3	1.6	49 %	9 %	40 - 140 %	25%
629-59-4	n-Tetradecane (C <sub>14</sub> )	3.3	1.7	51 %	3.3	1.8	54 %	6 %	40 - 140 %	25%
544-76-3	n-Hexadecane (C <sub>16</sub> )	3.3	2.1	63 %	3.3	2.1	63 %	0 %	40 - 140 %	25%
593-45-3	n-Octadecane (C <sub>18</sub> )	3.3	2.6	80 %	3.3	2.7	80 %	0 %	40 - 140 %	25%
n/a	n-C9 to n-C18 Group	20	10	52 %	20	11	54 %	4 %	40 - 140 %	25%
629-92-5	n-Nonadecane (C <sub>19</sub> )	3.3	2.7	82 %	3.3	2.8	84 %	2 %	40 - 140 %	25%
112-95-8	n-Eicosane (C <sub>20</sub> )	3.3	2.7	83 %	3.3	2.8	85 %	2 %	40 - 140 %	25%
629-97-0	n-Docosane (C <sub>22</sub> )	3.3	2.6	79 %	3.3	2.7	81 %	2 %	40 - 140 %	25%
646-31-1	n-Tetracosane (C <sub>24</sub> )	3.3	2.8	84 %	3.3	2.8	85 %	1 %	40 - 140 %	25%
630-01-3	n-Hexacosane (C <sub>26</sub> )	3.3	2.7	82 %	3.3	2.8	83 %	1 %	40 - 140 %	25%
630-02-4	n-Octacosane (C <sub>28</sub> )	3.3	2.7	81 %	3.3	2.7	82 %	2 %	40 - 140 %	25%
638-68-6	n-Triacontane (C <sub>30</sub> )	3.3	2.6	80 %	3.3	2.7	81 %	2 %	40 - 140 %	25%
630-06-8	n-Hexatriacontane (C <sub>36</sub> )	3.3	2.4	71 %	3.3	2.4	74 %	3 %	40 - 140 %	25%
n/a	n-C19 to n-C36 Group	26	21	80 %	26	22	82 %	2 %	40 - 140 %	25%
91-20-3	Naphthalene	3.3	1.6	49 %	3.3	1.7	50 %	2 %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	3.3	1.8	55 %	3.3	1.9	57 %	3 %	40 - 140 %	25%
208-96-8	Acenaphthylene	3.3	2.1	64 %	3.3	2.1	64 %	0 %	40 - 140 %	25%
83-32-9	Acenaphthene	3.3	2.1	64 %	3.3	2.1	64 %	1 %	40 - 140 %	25%
86-73-7	Fluorene	3.3	2.3	71 %	3.3	2.3	69 %	2 %	40 - 140 %	25%
85-01-8	Phenanthrene	3.3	2.9	87 %	3.3	2.8	85 %	2 %	40 - 140 %	25%
120-12-7	Anthracene	3.3	2.9	88 %	3.3	2.9	88 %	1 %	40 - 140 %	25%
206-44-0	Fluoranthene	3.3	3.1	95 %	3.3	3.2	96 %	1 %	40 - 140 %	25%
129-00-0	Pyrene	3.3	3.1	94 %	3.3	3.1	95 %	1 %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	3.3	2.9	88 %	3.3	2.9	89 %	2 %	40 - 140 %	25%
218-01-9	Chrysene	3.3	3.2	97 %	3.3	3.3	99 %	2 %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	3.3	2.8	85 %	3.3	2.9	87 %	3 %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	3.3	3.0	90 %	3.3	3.0	92 %	2 %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	3.3	3.0	89 %	3.3	3.0	91 %	2 %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	3.3	2.8	86 %	3.3	2.9	88 %	2 %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	3.3	2.9	89 %	3.3	3.0	91 %	2 %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	3.3	2.8	85 %	3.3	2.8	86 %	2 %	40 - 140 %	25%
n/a	PAH Group	56	45	81 %	56	46	82 %	1 %	40 - 140 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.6	96 %	2.7	2.5	93 %
	2-Bromonaphthalene	2.7	2.6	96 %	2.7	2.6	96 %
Extraction:	Chloro-octadecane	2.7	2.0	74 %	2.7	2.0	74 %
	ortho-Terphenyl	2.7	2.3	85 %	2.7	2.3	85 %

Fractionation Breakthrough Evaluation						QC Limits
91-20-3	Naphthalene	LCS	0 %	LCSD	0 %	5%
91-57-6	2-Methylnaphthalene	LCS	0 %	LCSD	0 %	5%

**Method Reference:** Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Method modified by use of microwave accelerated solvent extraction technique.

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units. The LCS and LCSD are prepared from separate source standards than those used for calibration.



## Quality Control Report Method Blank

Category: **MA DEP EPH**  
QC Batch ID: **EP-3124-M**  
Matrix: **Soil**

Instrument ID: **GC-9 Agilent 6890**  
Extracted: **06-28-10 19:30**  
Analyzed (AL): **06-30-10 15:20**  
Analyzed (AR): **06-30-10 16:04**  
Analyst: **KM**

EPH Ranges		Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons <sup>†</sup>		BRL		mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons <sup>†</sup>		BRL		mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons <sup>†◊</sup>		BRL		mg/Kg	30
<u>Unadjusted</u> n-C11 to n-C22 Aromatic Hydrocarbons <sup>†</sup>		BRL		mg/Kg	30

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.5	<b>94</b> %	40 - 140 %
	2-Bromonaphthalene	2.7	2.7	<b>100</b> %	40 - 140 %
Extraction:	Chloro-octadecane	2.7	1.8	<b>68</b> %	40 - 140 %
	<i>ortho</i> -Terphenyl	2.7	1.9	<b>72</b> %	40 - 140 %

**Method Reference:** Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).  
Sample extraction performed by microwave accelerated solvent extraction technique.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

## Quality Control Report Laboratory Control Samples

Category: <b>MA DEP VPH</b> QC Batch ID: <b>VP-1678-E</b> Matrix: <b>Soil</b> Units: <b>mg/Kg</b>	<b>LCS</b> Instrument ID: <b>GC-1 HP 5890</b> Analyzed: <b>06-23-10 11:59</b> Analyst: <b>TRA</b>	<b>LCSD</b> Instrument ID: <b>GC-1 HP 5890</b> Analyzed: <b>06-23-10 12:40</b> Analyst: <b>TRA</b>
--	--	---

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
109-66-0	<i>n</i> -Pentane	2.5	1.9	77 %	2.5	2.2	89 %	15 %	70 - 130 %	25%
107-83-5	2-Methylpentane	2.5	2.0	80 %	2.5	2.3	92 %	14 %	70 - 130 %	25%
540-84-1	2,2,4-Trimethylpentane	2.5	2.2	90 %	2.5	2.6	102 %	13 %	70 - 130 %	25%
n/a	Aliphatic Group 1	7.5	6.1	82 %	7.5	7.1	94 %	14 %	70 - 130 %	25%
111-84-2	<i>n</i> -Nonane	2.5	2.2	87 %	2.5	2.5	99 %	12 %	70 - 130 %	25%
124-18-5	<i>n</i> -Decane	2.5	2.5	101 %	2.5	2.7	109 %	8 %	70 - 130 %	25%
1678-93-9	<i>n</i> -Butylcyclohexane	2.5	2.3	91 %	2.5	2.6	103 %	13 %	70 - 130 %	25%
n/a	Aliphatic Group 2	7.5	7.0	93 %	7.5	7.8	104 %	11 %	70 - 130 %	25%
1634-04-4	Methyl <i>tert</i> -butyl Ether	2.5	2.0	80 %	2.5	2.3	94 %	16 %	70 - 130 %	25%
71-43-2	Benzene	2.5	2.1	84 %	2.5	2.4	96 %	14 %	70 - 130 %	25%
108-88-3	Toluene	2.5	2.2	86 %	2.5	2.5	99 %	14 %	70 - 130 %	25%
100-41-4	Ethylbenzene	2.5	2.1	85 %	2.5	2.4	98 %	14 %	70 - 130 %	25%
108-38-3 and 106-42-3	<i>meta</i> -Xylene and <i>para</i> -Xylene	5.0	4.3	86 %	5.0	4.9	98 %	13 %	70 - 130 %	25%
95-47-6	<i>ortho</i> -Xylene	2.5	2.1	82 %	2.5	2.3	93 %	12 %	70 - 130 %	25%
95-63-6	1,2,4-Trimethylbenzene	2.5	2.2	87 %	2.5	2.5	99 %	14 %	70 - 130 %	25%
91-20-3	Naphthalene	2.5	1.9	77 %	2.5	2.2	89 %	14 %	70 - 130 %	25%
n/a	Aromatic Group	23	19	84 %	23	22	98 %	15 %	70 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	2.5	2.6	104 %	2.5	2.6	103 %	70 - 130 %
2,5-Dibromotoluene (FID)	2.5	2.7	106 %	2.5	2.6	105 %	70 - 130 %

**Method Reference:** Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

## Quality Control Report Method Blank

Category: **MA DEP VPH**  
QC Batch ID: **VP-1678-E**  
Matrix: **Soil**

Instrument ID: **GC-1 HP 5890**  
Analyzed: **06-23-10 13:21**  
Analyst: **TRA**

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons <sup>†</sup> <sup>◇</sup>	BRL		mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons <sup>†</sup> <sup>⊗</sup>	BRL		mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons <sup>†</sup>	BRL		mg/Kg	1.0

Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons <sup>†</sup>	BRL		mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons <sup>†</sup>	BRL		mg/Kg	1.0

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	2.5	2.6	<b>104</b> %	70 - 130 %
2,5-Dibromotoluene (FID)	2.5	2.6	<b>104</b> %	70 - 130 %

**Method Reference:** Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◇ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

⌵ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

**Quality Control Report  
Laboratory Control Samples**

Category: **Inorganics**

Matrix: **Solid**

Units: **mg/Kg**

<u>Sample Type</u>	<u>Method</u>	<u>QC Batch ID</u>	<u>Prep Method</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Instrument ID</u>	<u>Analyst</u>
LCS	EPA 9012A	TCN-1580-S	EPA 9012A	6/24/2010 9:00	6/24/2010 11:33	Lachat 8000 Autoanalyzer JR	
LCSD	EPA 9012A	TCN-1580-S	EPA 9012A	6/24/2010 9:00	6/24/2010 11:35	Lachat 8000 Autoanalyzer JR	

Analyte	LCS			LCS Duplicate				QC Limits		Method
	Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
Cyanide, Total	34	37	107%	34	36	105%	2 %	40-160%	35 %	EPA 9012A

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised (1983), and  
Methods for the Determination of Metals in Environmental Samples, Supplement I, EPA-600/R-94-111,  
(1994), and 40 C.F.R. 136, Appendix C (1990).

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology,  
or alternatively based upon the historical average recovery plus or minus three standard deviation units.

## Quality Control Report Laboratory Control Samples

Category: **Inorganics**

Matrix: **Solid**

Units: **mg/Kg**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	MA DEP 1996 Protocol	PCN-0554-S	MA DEP 1996 Protocol	6/29/2010 8:00	6/29/2010 10:17	Lachat 8000 Autoanalyzer JR	
LCSD	MA DEP 1996 Protocol	PCN-0554-S	MA DEP 1996 Protocol	6/29/2010 8:00	6/29/2010 10:19	Lachat 8000 Autoanalyzer JR	

Analyte	LCS			LCS Duplicate				QC Limits		Method
	Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
Cyanide, Physiologically Available	10	10	103%	10	11	105%	2 %	80-120%	35 %	MA DEP 1996 Protocol

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised (1983), and  
Methods for the Determination of Metals in Environmental Samples, Supplement I, EPA-600/R-94-111,  
(1994), and 40 C.F.R. 136, Appendix C (1990).

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology,  
or alternatively based upon the historical average recovery plus or minus three standard deviation units.

## Quality Control Report Laboratory Control Sample

Category: **Inorganic Chemistry**  
Matrix: **Solid**

Analyte	Units	Spiked	Measured	Recovery	QC Limits	Analyzed	QC Batch	Method	Inst	Analyst
Prussian Blue Check	mg/Kg	10	0	0 %	< 10%	06-29-10 10:16	PCN-0554-S	MA DEP 1996 Protocol	1	JR

**Method Reference:** Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

1 Instrument ID: Lachat 8000 Autoanalyzer



**Quality Control Report  
Method Blank**Category: **Inorganic Chemistry**Matrix: **Soil**

Analyte	Result	Units	RL	Analyzed	QC Batch	Method	Inst	Analyst
Cyanide, Total	BRL	mg/Kg	1	06-24-10 11:33	TCN-1580-S	EPA 9012A	1	JR
Cyanide, Physiologically Available	BRL	mg/Kg	1	06-29-10 10:15	PCN-0554-S	MA DEP Protocol	1	JR

**Method Reference:** Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

RL Reporting Limit.

1 Instrument ID: Lachat 8000 Autoanalyzer

## Quality Control Report Laboratory Control Samples

Category:	<b>EPA 8082</b>	LCS	Instrument ID:	<b>GC-13 Agilent 6890</b>	LCSD	Instrument ID:	<b>GC-13 Agilent 6890</b>
QC Batch ID:	<b>PB-3469-P</b>		Extracted:	<b>06-22-10 19:00</b>		Extracted:	<b>06-22-10 19:00</b>
Matrix:	<b>Soil</b>		Cleaned Up:	<b>06-25-10 21:30</b>		Cleaned Up:	<b>06-25-10 21:30</b>
Units:	<b>ug/Kg</b>		Analyzed:	<b>06-26-10 12:06</b>		Analyzed:	<b>06-26-10 12:29</b>
			Analyst:	<b>CRL</b>		Analyst:	<b>CRL</b>

CAS Number	Analyte	LCS					LCS Duplicate								QC Limits	
		Spiked	Measured		Recovery		Spiked	Measured		Recovery		RPD				
			1st Col	2nd Col	1st Col	2nd Col		1st Col	2nd Col	1st Col	2nd Col	1st Col	2nd Col	Spike	RPD	
12674-11-2	Aroclor 1016	330	270	270	81%	82%	330	260	260	79%	77%	3 %	6 %	40 - 140%	30 %	
11096-82-5	Aroclor 1260	330	300	310	89%	93%	330	270	270	82%	81%	9 %	14 %	40 - 140%	30 %	

QC Surrogate Compound	Surrogate Recovery										QC Limits	
Tetrachloro- <i>m</i> -xylene	13	9.9	10	75%	76%	13	9.8	9.6	74%	72%	30 - 150 %	
Decachlorobiphenyl	13	13	13	98%	101%	13	12	12	94%	92%	30 - 150 %	

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample extraction performed by EPA Method 3545. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

## Quality Control Report Method Blank

Category: **EPA Method 8082**  
QC Batch ID: **PB-3469-P**  
Matrix: **Soil**

Instrument ID: **GC-13 Agilent 6890**  
Extracted: **06-22-10 19:00**  
Cleaned Up: **06-25-10 21:30**  
Analyzed: **06-26-10 11:39**  
Analyst: **CRL**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	80
11104-28-2	Aroclor 1221	BRL		ug/Kg	80
11141-16-5	Aroclor 1232	BRL		ug/Kg	80
53469-21-9	Aroclor 1242	BRL		ug/Kg	80
12672-29-6	Aroclor 1248	BRL		ug/Kg	80
11097-69-1	Aroclor 1254	BRL		ug/Kg	80
11096-82-5	Aroclor 1260	BRL		ug/Kg	80
37324-23-5	Aroclor 1262 <sup>†</sup>	BRL		ug/Kg	80
11100-14-4	Aroclor 1268 <sup>†</sup>	BRL		ug/Kg	80

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro- <i>m</i> -xylene	13	11	<b>80</b> %	30 - 150 %
	Decachlorobiphenyl	13	13	<b>96</b> %	30 - 150 %
Second Column	Tetrachloro- <i>m</i> -xylene	13	11	<b>79</b> %	30 - 150 %
	Decachlorobiphenyl	13	13	<b>98</b> %	30 - 150 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample extraction performed by EPA Method 3545. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.  
<sup>†</sup> Non-target analyte. Result is based on a single mid-range calibration standard.

## Quality Control Report Laboratory Control Samples

Category: **Metals**

Matrix: **Soil**

Units: **mg/Kg**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 6010B	MB-1860-SL	EPA 3050B	06-22-10 00:00	06-22-10 19:53	ICP-1 PE 3000	JK
LCS	EPA 7471A	MP-2564-SL	EPA 7471A	06-22-10 00:00	06-23-10 15:43	CVAA-1 PE FIMS	MP
LCSD	EPA 6010B	MB-1860-SL	EPA 3050B	06-22-10 00:00	06-22-10 19:59	ICP-1 PE 3000	JK
LCSD	EPA 7471A	MP-2564-SL	EPA 7471A	06-22-10 00:00	06-23-10 15:46	CVAA-1 PE FIMS	MP

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits		Method
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
7440-38-2	Arsenic	140	120	86%	140	140	104%	9 %	83-117 %	30 %	EPA 6010B
7440-39-3	Barium	270	230	86%	270	280	104%	9 %	79-121 %	30 %	EPA 6010B
7440-43-9	Cadmium	71	66	93%	71	77	109%	8 %	80-120 %	30 %	EPA 6010B
7440-47-3	Chromium	110	99	94%	110	110	109%	7 %	80-119 %	30 %	EPA 6010B
7439-92-1	Lead	140	120	87%	140	150	106%	10 %	81-119 %	30 %	EPA 6010B
7439-97-6	Mercury	25	21	83%	25	22	87%	2 %	72-128 %	30 %	EPA 7471A
7782-49-2	Selenium	200	170	84%	200	200	98%	8 %	80-120 %	30 %	EPA 6010B
7440-22-4	Silver	45	38	84%	45	43	95%	6 %	66-134 %	30 %	EPA 6010B

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

## Quality Control Report Method Blank

Category: **Metals**  
Matrix: **Soil**

<u>Analysis Method</u>	<u>QC Batch ID</u>	<u>Prep Method</u>	<u>Prepared</u>	<u>Sample Volume</u>	<u>Instrument ID</u>	<u>Analyst</u>
EPA 6010B	MB-1860-SB	EPA 3050B	06-22-10 00:00	0.5 g	ICP-1 PE 3000	JK
EPA 7471A	MP-2564-SB	EPA 7471A	06-22-10 00:00	0.6 g	CVAA-1 PE FIMS	MP

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-38-2	Arsenic	BRL		mg/Kg	3.0	1	06-22-10 19:49	EPA 6010B
7440-39-3	Barium	BRL		mg/Kg	5.0	1	06-22-10 19:49	EPA 6010B
7440-43-9	Cadmium	BRL		mg/Kg	0.50	1	06-22-10 19:49	EPA 6010B
7440-47-3	Chromium	BRL		mg/Kg	1.0	1	06-22-10 19:49	EPA 6010B
7439-92-1	Lead	BRL		mg/Kg	5.0	1	06-22-10 19:49	EPA 6010B
7439-97-6	Mercury	BRL		mg/Kg	0.017	1	06-23-10 15:43	EPA 7471A
7782-49-2	Selenium	BRL		mg/Kg	5.0	1	06-22-10 19:49	EPA 6010B
7440-22-4	Silver	BRL		mg/Kg	1.0	1	06-22-10 19:49	EPA 6010B

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.  
DF Dilution Factor.

## Quality Control Report Laboratory Control Samples

Category:	<b>EPA Method 8260B</b>	LCS	Instrument ID:	<b>MS-1 HP 5890</b>	LCSD	Instrument ID:	<b>MS-1 HP 5890</b>
QC Batch ID:	<b>VM1-2854-E</b>	Analyzed:	<b>06-22-10 07:40</b>	Analyzed:	<b>06-22-10 08:15</b>		
Matrix:	<b>Soil</b>	Analyst:	<b>LMG</b>	Analyst:	<b>LMG</b>		
Units:	<b>ug/kg</b>						

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CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
75-71-8	Dichlorodifluoromethane	2,500	2,200	86 %	2,500	2,500	100 %	15 %	70 - 130 %	25%
74-87-3	Chloromethane	2,500	2,600	106 %	2,500	2,900	118 %	11 %	70 - 130 %	25%
75-01-4	Vinyl Chloride	2,500	2,700	108 %	2,500	3,100	123 %	13 %	70 - 130 %	25%
74-83-9	Bromomethane	2,500	2,500	98 %	2,500	2,700	106 %	8 %	70 - 130 %	25%
75-00-3	Chloroethane	2,500	2,800	113 %	2,500	3,100	125 %	10 %	70 - 130 %	25%
75-69-4	Trichlorofluoromethane	2,500	2,600	105 %	2,500	2,900	115 %	9 %	70 - 130 %	25%
60-29-7	Diethyl Ether	5,000	5,100	101 %	5,000	5,200	105 %	3 %	70 - 130 %	25%
75-35-4	1,1-Dichloroethene	2,500	2,700	108 %	2,500	2,900	118 %	8 %	70 - 130 %	25%
76-13-1	1,1,2-Trichlorotrifluoroethane	5,000	6,100	122 %	5,000	6,800	135 % q	10 %	70 - 130 %	25%
67-64-1	Acetone	5,000	5,000	100 %	5,000	4,700	94 %	6 %	70 - 130 %	25%
75-15-0	Carbon Disulfide	5,000	4,900	97 %	5,000	5,600	111 %	13 %	70 - 130 %	25%
75-09-2	Methylene Chloride	2,500	2,400	97 %	2,500	3,200	128 %	27 % q	70 - 130 %	25%
107-13-1	Acrylonitrile	2,500	2,700	106 %	2,500	2,600	103 %	3 %	70 - 130 %	25%
156-60-5	trans- 1,2-Dichloroethene	2,500	2,700	109 %	2,500	3,000	121 %	11 %	70 - 130 %	25%
1634-04-4	Methyl tert- butyl Ether (MTBE)	2,500	2,200	87 %	2,500	2,500	101 %	15 %	70 - 130 %	25%
75-34-3	1,1-Dichloroethane	2,500	2,600	104 %	2,500	2,900	118 %	12 %	70 - 130 %	25%
594-20-7	2,2-Dichloropropane	2,500	2,300	94 %	2,500	2,800	112 %	18 %	70 - 130 %	25%
156-59-2	cis- 1,2-Dichloroethene	2,500	2,100	86 %	2,500	2,900	116 %	30 % q	70 - 130 %	25%
78-93-3	2-Butanone (MEK)	5,000	5,100	103 %	5,000	5,000	100 %	3 %	70 - 130 %	25%
74-97-5	Bromochloromethane	2,500	2,600	103 %	2,500	3,000	119 %	14 %	70 - 130 %	25%
109-99-9	Tetrahydrofuran (THF)	5,000	5,200	103 %	5,000	5,400	108 %	5 %	70 - 130 %	25%
67-66-3	Chloroform	2,500	2,600	105 %	2,500	3,000	121 %	14 %	70 - 130 %	25%
71-55-6	1,1,1-Trichloroethane	2,500	2,700	109 %	2,500	3,200	130 %	17 %	70 - 130 %	25%
56-23-5	Carbon Tetrachloride	2,500	2,600	102 %	2,500	3,000	121 %	17 %	70 - 130 %	25%
563-58-6	1,1-Dichloropropene	2,500	2,600	105 %	2,500	2,800	114 %	8 %	70 - 130 %	25%
71-43-2	Benzene	2,500	2,600	105 %	2,500	3,000	121 %	14 %	70 - 130 %	25%
107-06-2	1,2-Dichloroethane	2,500	2,500	100 %	2,500	2,700	107 %	7 %	70 - 130 %	25%
79-01-6	Trichloroethene	2,500	2,700	108 %	2,500	3,000	119 %	9 %	70 - 130 %	25%
78-87-5	1,2-Dichloropropane	2,500	2,600	103 %	2,500	2,800	114 %	10 %	70 - 130 %	25%
74-95-3	Dibromomethane	2,500	2,500	101 %	2,500	2,800	112 %	11 %	70 - 130 %	25%
75-27-4	Bromodichloromethane	2,500	2,800	110 %	2,500	3,000	121 %	10 %	70 - 130 %	25%
123-91-1	1,4-Dioxane	50,000	38,000	76 %	50,000	39,000	77 %	2 %	70 - 130 %	25%
10061-01-5	cis- 1,3-Dichloropropene	2,500	2,600	103 %	2,500	2,800	112 %	9 %	70 - 130 %	25%
108-10-1	4-Methyl-2-Pentanone (MIBK)	5,000	5,300	106 %	5,000	5,200	103 %	2 %	70 - 130 %	25%
108-88-3	Toluene	2,500	2,700	108 %	2,500	3,100	122 %	13 %	70 - 130 %	25%
10061-02-6	trans- 1,3-Dichloropropene	2,500	2,200	90 %	2,500	2,600	104 %	15 %	70 - 130 %	25%
79-00-5	1,1,2-Trichloroethane	2,500	2,400	95 %	2,500	2,600	104 %	9 %	70 - 130 %	25%
127-18-4	Tetrachloroethene	2,500	2,600	105 %	2,500	3,100	126 %	18 %	70 - 130 %	25%
142-28-9	1,3-Dichloropropane	2,500	2,600	102 %	2,500	2,800	112 %	9 %	70 - 130 %	25%
591-78-6	2-Hexanone	5,000	4,700	94 %	5,000	4,500	89 %	5 %	70 - 130 %	25%
124-48-1	Dibromochloromethane	2,500	2,600	104 %	2,500	2,900	115 %	10 %	70 - 130 %	25%
106-93-4	1,2-Dibromoethane (EDB)	2,500	2,600	104 %	2,500	2,700	109 %	5 %	70 - 130 %	25%
108-90-7	Chlorobenzene	2,500	2,500	100 %	2,500	2,700	109 %	9 %	70 - 130 %	25%
630-20-6	1,1,1,2-Tetrachloroethane	2,500	2,600	105 %	2,500	3,100	122 %	15 %	70 - 130 %	25%
100-41-4	Ethylbenzene	2,500	2,600	103 %	2,500	2,900	114 %	11 %	70 - 130 %	25%
108-38-3/106-42-3	meta- Xylene and para- Xylene	5,000	4,900	98 %	5,000	5,400	108 %	10 %	70 - 130 %	25%
95-47-6	ortho- Xylene	2,500	2,600	103 %	2,500	2,800	113 %	9 %	70 - 130 %	25%
100-42-5	Styrene	2,500	2,000	79 %	2,500	2,300	90 %	13 %	70 - 130 %	25%
75-25-2	Bromoform	2,500	2,800	111 %	2,500	2,900	117 %	5 %	70 - 130 %	25%

## Quality Control Report Laboratory Control Samples

Category:	<b>EPA Method 8260B</b>	LCS	Instrument ID:	<b>MS-1 HP 5890</b>	LCSD	Instrument ID:	<b>MS-1 HP 5890</b>
QC Batch ID:	<b>VM1-2854-E</b>	Analyzed:	<b>06-22-10 07:40</b>	Analyzed:	<b>06-22-10 08:15</b>		
Matrix:	<b>Soil</b>	Analyst:	<b>LMG</b>	Analyst:	<b>LMG</b>		
Units:	<b>ug/kg</b>						

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CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
98-82-8	Isopropylbenzene	2,500	2,200	87 %	2,500	2,300	91 %	5 %	70 - 130 %	25%
108-86-1	Bromobenzene	2,500	2,800	112 %	2,500	2,800	114 %	1 %	70 - 130 %	25%
79-34-5	1,1,2,2-Tetrachloroethane	2,500	2,500	100 %	2,500	2,500	99 %	2 %	70 - 130 %	25%
96-18-4	1,2,3-Trichloropropane	2,500	2,500	99 %	2,500	2,800	111 %	11 %	70 - 130 %	25%
110-57-6	trans-1,4-Dichloro-2-butene	10,000	10,000	102 %	10,000	10,000	102 %	0 %	70 - 130 %	25%
103-65-1	n-Propylbenzene	2,500	2,400	97 %	2,500	2,500	100 %	3 %	70 - 130 %	25%
95-49-8	2-Chlorotoluene	2,500	2,600	103 %	2,500	2,800	114 %	11 %	70 - 130 %	25%
108-67-8	1,3,5-Trimethylbenzene	2,500	2,600	102 %	2,500	2,600	105 %	3 %	70 - 130 %	25%
106-43-4	4-Chlorotoluene	2,500	2,700	107 %	2,500	2,600	102 %	4 %	70 - 130 %	25%
98-06-6	tert-Butylbenzene	2,500	2,500	102 %	2,500	2,700	108 %	6 %	70 - 130 %	25%
95-63-6	1,2,4-Trimethylbenzene	2,500	2,500	101 %	2,500	2,800	113 %	12 %	70 - 130 %	25%
135-98-8	sec-Butylbenzene	2,500	2,600	102 %	2,500	2,700	108 %	6 %	70 - 130 %	25%
541-73-1	1,3-Dichlorobenzene	2,500	2,400	97 %	2,500	2,700	107 %	10 %	70 - 130 %	25%
99-87-6	4-Isopropyltoluene	2,500	2,600	103 %	2,500	2,700	108 %	5 %	70 - 130 %	25%
106-46-7	1,4-Dichlorobenzene	2,500	2,600	103 %	2,500	2,600	105 %	3 %	70 - 130 %	25%
95-50-1	1,2-Dichlorobenzene	2,500	2,500	98 %	2,500	2,700	106 %	8 %	70 - 130 %	25%
104-51-8	n-Butylbenzene	2,500	2,600	102 %	2,500	2,700	106 %	4 %	70 - 130 %	25%
96-12-8	1,2-Dibromo-3-chloropropane	2,500	2,500	99 %	2,500	2,200	89 %	11 %	70 - 130 %	25%
108-70-3	1,3,5-Trichlorobenzene	2,500	2,800	113 %	2,500	3,000	119 %	5 %	70 - 130 %	25%
120-82-1	1,2,4-Trichlorobenzene	2,500	2,700	108 %	2,500	2,900	116 %	7 %	70 - 130 %	25%
87-68-3	Hexachlorobutadiene	2,500	2,900	116 %	2,500	3,100	123 %	6 %	70 - 130 %	25%
91-20-3	Naphthalene	2,500	2,500	101 %	2,500	2,500	99 %	3 %	70 - 130 %	25%
87-61-6	1,2,3-Trichlorobenzene	2,500	2,400	97 %	2,500	2,500	99 %	2 %	70 - 130 %	25%
75-65-0	tert-Butyl Alcohol (TBA)	50,000	35,000	71 %	50,000	35,000	71 %	0 %	70 - 130 %	25%
108-20-3	Di-isopropyl Ether (DIPE)	2,500	2,500	101 %	2,500	2,800	112 %	11 %	70 - 130 %	25%
637-92-3	Ethyl tert-butyl Ether (ETBE)	2,500	1,800	70 %	2,500	1,800	71 %	2 %	70 - 130 %	25%
994-05-8	tert-Amyl Methyl Ether (TAME)	2,500	1,800	71 %	2,500	1,900	75 %	7 %	70 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	2,500	2,400	95 %	2,500	2,500	102 %	70 - 130 %
1,2-Dichloroethane-d <sub>4</sub>	2,500	2,400	95 %	2,500	2,800	112 %	70 - 130 %
Toluene-d <sub>8</sub>	2,500	2,400	96 %	2,500	2,600	104 %	70 - 130 %
4-Bromofluorobenzene	2,500	2,600	105 %	2,500	2,600	106 %	70 - 130 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample preparation performed by EPA Method 5035A.

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

q Recovery outside recommended limits.



## Quality Control Report Method Blank

Category: **EPA Method 8260B**  
QC Batch ID: **VM1-2854-E**  
Matrix: **Soil**

Instrument ID: **MS-1 HP 5890**  
Analyzed: **06-22-10 08:49**  
Analyst: **LMG**

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CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/Kg	500
74-87-3	Chloromethane	BRL		ug/Kg	500
75-01-4	Vinyl Chloride	BRL		ug/Kg	500
74-83-9	Bromomethane	BRL		ug/Kg	500
75-00-3	Chloroethane	BRL		ug/Kg	500
75-69-4	Trichlorofluoromethane	BRL		ug/Kg	500
60-29-7	Diethyl Ether	BRL		ug/Kg	500
75-35-4	1,1-Dichloroethene	BRL		ug/Kg	250
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/Kg	2,500
67-64-1	Acetone	BRL		ug/Kg	2,500
75-15-0	Carbon Disulfide	BRL		ug/Kg	2,500
75-09-2	Methylene Chloride	BRL		ug/Kg	1,000
107-13-1	Acrylonitrile	BRL		ug/Kg	250
156-60-5	<i>trans</i> - 1,2-Dichloroethene	BRL		ug/Kg	250
1634-04-4	Methyl <i>tert</i> - butyl Ether (MTBE)	BRL		ug/Kg	250
75-34-3	1,1-Dichloroethane	BRL		ug/Kg	250
594-20-7	2,2-Dichloropropane	BRL		ug/Kg	250
156-59-2	<i>cis</i> - 1,2-Dichloroethene	BRL		ug/Kg	250
78-93-3	2-Butanone (MEK)	BRL		ug/Kg	2,500
74-97-5	Bromochloromethane	BRL		ug/Kg	250
109-99-9	Tetrahydrofuran (THF)	BRL		ug/Kg	2,500
67-66-3	Chloroform	BRL		ug/Kg	250
71-55-6	1,1,1-Trichloroethane	BRL		ug/Kg	250
56-23-5	Carbon Tetrachloride	BRL		ug/Kg	250
563-58-6	1,1-Dichloropropene	BRL		ug/Kg	250
71-43-2	Benzene	BRL		ug/Kg	250
107-06-2	1,2-Dichloroethane	BRL		ug/Kg	250
79-01-6	Trichloroethene	BRL		ug/Kg	250
78-87-5	1,2-Dichloropropane	BRL		ug/Kg	250
74-95-3	Dibromomethane	BRL		ug/Kg	250
75-27-4	Bromodichloromethane	BRL		ug/Kg	250
123-91-1	1,4-Dioxane	BRL		ug/Kg	250,000
10061-01-5	<i>cis</i> - 1,3-Dichloropropene	BRL		ug/Kg	250
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/Kg	2,500
108-88-3	Toluene	BRL		ug/Kg	250
10061-02-6	<i>trans</i> - 1,3-Dichloropropene	BRL		ug/Kg	250
79-00-5	1,1,2-Trichloroethane	BRL		ug/Kg	250
127-18-4	Tetrachloroethene	BRL		ug/Kg	250
142-28-9	1,3-Dichloropropane	BRL		ug/Kg	250
591-78-6	2-Hexanone	BRL		ug/Kg	2,500
124-48-1	Dibromochloromethane	BRL		ug/Kg	250
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	250
108-90-7	Chlorobenzene	BRL		ug/Kg	250
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/Kg	250
100-41-4	Ethylbenzene	BRL		ug/Kg	250
108-38-3/106-42-3	<i>meta</i> - Xylene and <i>para</i> - Xylene	BRL		ug/Kg	250
95-47-6	<i>ortho</i> - Xylene	BRL		ug/Kg	250
100-42-5	Styrene	BRL		ug/Kg	250
75-25-2	Bromoform	BRL		ug/Kg	250

## Quality Control Report Method Blank

Category: **EPA Method 8260B**  
QC Batch ID: **VM1-2854-E**  
Matrix: **Soil**

Instrument ID: **MS-1 HP 5890**  
Analyzed: **06-22-10 08:49**  
Analyst: **LMG**

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CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
98-82-8	Isopropylbenzene	BRL		ug/Kg	250
108-86-1	Bromobenzene	BRL		ug/Kg	250
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/Kg	250
96-18-4	1,2,3-Trichloropropane	BRL		ug/Kg	250
110-57-6	<i>trans</i> -1,4-Dichloro-2-butene	BRL		ug/Kg	2,500
103-65-1	<i>n</i> -Propylbenzene	BRL		ug/Kg	250
95-49-8	2-Chlorotoluene	BRL		ug/Kg	250
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/Kg	250
106-43-4	4-Chlorotoluene	BRL		ug/Kg	250
98-06-6	<i>tert</i> -Butylbenzene	BRL		ug/Kg	250
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/Kg	250
135-98-8	<i>sec</i> -Butylbenzene	BRL		ug/Kg	250
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	250
99-87-6	4-Isopropyltoluene	BRL		ug/Kg	250
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	250
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	250
104-51-8	<i>n</i> -Butylbenzene	BRL		ug/Kg	250
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/Kg	250
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/Kg	250
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	250
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	250
91-20-3	Naphthalene	BRL		ug/Kg	250
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/Kg	250
75-65-0	<i>tert</i> -Butyl Alcohol (TBA)	BRL		ug/Kg	10,000
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/Kg	250
637-92-3	Ethyl <i>tert</i> -butyl Ether (ETBE)	BRL		ug/Kg	250
994-05-8	<i>tert</i> -Amyl Methyl Ether (TAME)	BRL		ug/Kg	250

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	2,500	2,500	<b>100</b> %	70 - 130 %
1,2-Dichloroethane-d <sub>4</sub>	2,500	2,400	<b>95</b> %	70 - 130 %
Toluene-d <sub>8</sub>	2,500	2,400	<b>97</b> %	70 - 130 %
4-Bromofluorobenzene	2,500	2,500	<b>101</b> %	70 - 130 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample preparation performed by EPA Method 5035A.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

## Quality Control Report Laboratory Control Samples

Category:	<b>EPA Method 8270C</b>	LCS	<b>MS-12 Agilent 6890</b>	LCSD	<b>MS-12 Agilent 6890</b>
QC Batch ID:	<b>SV-2361-P</b>	Extracted:	<b>06-29-10 11:00</b>	Instrument ID:	<b>MS-12 Agilent 6890</b>
Matrix:	<b>Soil</b>	Analyzed:	<b>06-30-10 17:14</b>	Extracted:	<b>06-29-10 11:00</b>
Units:	<b>ug/Kg</b>	Analyst:	<b>MJB</b>	Analyzed:	<b>06-30-10 17:58</b>
				Analyst:	<b>MJB</b>

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CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
62-75-9	N-Nitrosodimethylamine	3,300	2,200	65 %	3,300	2,300	69 %	6 %	40 - 140 %	25%
110-86-1	Pyridine	3,300	1,600	49 %	3,300	1,500	45 %	9 %	40 - 140 %	25%
108-95-2	Phenol	3,300	2,300	68 %	3,300	2,300	70 %	3 %	30 - 130 %	25%
62-53-3	Aniline	3,300	2,200	65 %	3,300	2,000	61 %	6 %	40 - 140 %	25%
111-44-4	Bis(2-chloroethyl) ether	3,300	2,300	68 %	3,300	2,400	71 %	4 %	40 - 140 %	25%
95-57-8	2-Chlorophenol	3,300	2,300	68 %	3,300	2,300	69 %	2 %	30 - 130 %	25%
541-73-1	1,3-Dichlorobenzene	3,300	2,000	60 %	3,300	2,100	63 %	5 %	40 - 140 %	25%
106-46-7	1,4-Dichlorobenzene	3,300	2,100	62 %	3,300	2,100	64 %	4 %	40 - 140 %	25%
100-51-6	Benzyl Alcohol	3,300	2,500	74 %	3,300	2,500	76 %	2 %	30 - 130 %	25%
95-50-1	1,2-Dichlorobenzene	3,300	2,100	63 %	3,300	2,200	65 %	3 %	40 - 140 %	25%
95-48-7	2-Methylphenol	3,300	2,400	71 %	3,300	2,400	73 %	3 %	30 - 130 %	25%
108-60-1	Bis(2-chloroisopropyl) ether	3,300	2,400	72 %	3,300	2,500	74 %	3 %	40 - 140 %	25%
106-44-5	4-Methylphenol	3,300	2,400	73 %	3,300	2,500	74 %	2 %	30 - 130 %	25%
621-64-7	N-Nitrosodi-n-propylamine	3,300	2,300	69 %	3,300	2,400	72 %	4 %	40 - 140 %	25%
98-86-2	Acetophenone	3,300	2,300	69 %	3,300	2,400	71 %	3 %	40 - 140 %	25%
67-72-1	Hexachloroethane	3,300	2,100	63 %	3,300	2,200	65 %	5 %	40 - 140 %	25%
98-95-3	Nitrobenzene	3,300	2,300	69 %	3,300	2,400	72 %	4 %	40 - 140 %	25%
78-59-1	Isophorone	3,300	2,400	71 %	3,300	2,400	72 %	2 %	40 - 140 %	25%
88-75-5	2-Nitrophenol	3,300	2,300	69 %	3,300	2,300	70 %	1 %	30 - 130 %	25%
105-67-9	2,4-Dimethylphenol	3,300	2,200	66 %	3,300	2,200	65 %	1 %	30 - 130 %	25%
111-91-1	Bis(2-chloroethoxy) methane	3,300	2,400	71 %	3,300	2,400	73 %	3 %	40 - 140 %	25%
120-83-2	2,4-Dichlorophenol	3,300	2,300	70 %	3,300	2,400	73 %	4 %	30 - 130 %	25%
120-82-1	1,2,4-Trichlorobenzene	3,300	2,200	66 %	3,300	2,300	69 %	4 %	40 - 140 %	25%
91-20-3	Naphthalene	3,300	2,200	67 %	3,300	2,300	69 %	3 %	40 - 140 %	25%
106-47-8	4-Chloroaniline	3,300	2,200	66 %	3,300	2,100	62 %	6 %	40 - 140 %	25%
87-68-3	Hexachlorobutadiene	3,300	2,200	66 %	3,300	2,300	68 %	3 %	40 - 140 %	25%
59-50-7	4-Chloro-3-methylphenol	3,300	2,400	73 %	3,300	2,500	75 %	3 %	30 - 130 %	25%
91-57-6	2-Methylnaphthalene	3,300	2,300	70 %	3,300	2,400	72 %	3 %	40 - 140 %	25%
77-47-4	Hexachlorocyclopentadiene	3,300	2,000	60 %	3,300	2,100	63 %	5 %	40 - 140 %	25%
88-06-2	2,4,6-Trichlorophenol	3,300	2,400	72 %	3,300	2,500	74 %	3 %	30 - 130 %	25%
95-95-4	2,4,5-Trichlorophenol	3,300	2,300	70 %	3,300	2,500	76 %	7 %	30 - 130 %	25%
91-58-7	2-Chloronaphthalene	3,300	2,400	71 %	3,300	2,500	74 %	4 %	40 - 140 %	25%
88-74-4	2-Nitroaniline	3,300	2,500	75 %	3,300	2,600	77 %	4 %	40 - 140 %	25%
100-25-4	1,4-Dinitrobenzene	3,300	2,500	75 %	3,300	2,600	79 %	5 %	40 - 140 %	25%
131-11-3	Dimethyl phthalate	3,300	2,500	75 %	3,300	2,600	78 %	5 %	40 - 140 %	25%
99-65-0	1,3-Dinitrobenzene	3,300	2,500	74 %	3,300	2,600	78 %	5 %	40 - 140 %	25%
208-96-8	Acenaphthylene	3,300	2,400	72 %	3,300	2,500	75 %	5 %	40 - 140 %	25%
606-20-2	2,6-Dinitrotoluene	3,300	2,500	74 %	3,300	2,600	77 %	5 %	40 - 140 %	25%
528-29-0	1,2-Dinitrobenzene	3,300	2,500	75 %	3,300	2,600	79 %	5 %	40 - 140 %	25%
99-09-2	3-Nitroaniline	3,300	2,500	75 %	3,300	2,400	72 %	4 %	40 - 140 %	25%
83-32-9	Acenaphthene	3,300	2,400	71 %	3,300	2,500	74 %	5 %	40 - 140 %	25%
51-28-5	2,4-Dinitrophenol	3,300	1,200	36 %	3,300	1,000	30 %	19 %	30 - 130 %	25%
100-02-7	4-Nitrophenol	3,300	2,500	75 %	3,300	2,500	76 %	2 %	30 - 130 %	25%
132-64-9	Dibenzofuran	3,300	2,400	72 %	3,300	2,500	75 %	4 %	40 - 140 %	25%
121-14-2	2,4-Dinitrotoluene	3,300	2,500	75 %	3,300	2,600	79 %	5 %	40 - 140 %	25%
84-66-2	Diethyl phthalate	3,300	2,500	76 %	3,300	2,700	80 %	5 %	40 - 140 %	25%
7005-72-3	4-Chlorophenyl phenyl ether	3,300	2,400	72 %	3,300	2,500	75 %	5 %	40 - 140 %	25%
86-73-7	Fluorene	3,300	2,400	72 %	3,300	2,500	76 %	5 %	40 - 140 %	25%

## Quality Control Report Laboratory Control Samples

Category:	EPA Method 8270C	LCS	Instrument ID:	MS-12 Agilent 6890	LCSD	Instrument ID:	MS-12 Agilent 6890
QC Batch ID:	SV-2361-P		Extracted:	06-29-10 11:00		Extracted:	06-29-10 11:00
Matrix:	Soil		Analyzed:	06-30-10 17:14		Analyzed:	06-30-10 17:58
Units:	ug/Kg		Analyst:	MJB		Analyst:	MJB

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CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
100-01-6	4-Nitroaniline	3,300	2,900	88 %	3,300	3,100	94 %	6 %	40 - 140 %	25%
534-52-1	4,6-Dinitro-2-methylphenol	3,300	1,800	54 %	3,300	1,600	47 %	14 %	30 - 130 %	25%
86-30-6	N-Nitrosodiphenylamine †	3,300	2,500	74 %	3,300	2,600	78 %	5 %	40 - 140 %	25%
122-66-7	1,2-Diphenylhydrazine à	3,300	2,500	76 %	3,300	2,600	79 %	4 %	40 - 140 %	25%
101-55-3	4-Bromophenyl phenyl ether	3,300	2,400	72 %	3,300	2,500	76 %	5 %	40 - 140 %	25%
118-74-1	Hexachlorobenzene	3,300	2,400	72 %	3,300	2,500	76 %	5 %	40 - 140 %	25%
87-86-5	Pentachlorophenol	3,300	2,300	70 %	3,300	2,400	73 %	4 %	30 - 130 %	25%
85-01-8	Phenanthrene	3,300	2,400	73 %	3,300	2,600	77 %	5 %	40 - 140 %	25%
120-12-7	Anthracene	3,300	2,400	73 %	3,300	2,600	77 %	5 %	40 - 140 %	25%
86-74-8	Carbazole	3,300	3,000	91 %	3,300	3,300	98 %	7 %	40 - 140 %	25%
84-74-2	Di-n-butyl phthalate	3,300	2,500	75 %	3,300	2,600	78 %	4 %	40 - 140 %	25%
206-44-0	Fluoranthene	3,300	2,400	73 %	3,300	2,600	77 %	5 %	40 - 140 %	25%
129-00-0	Pyrene	3,300	2,500	74 %	3,300	2,700	80 %	7 %	40 - 140 %	25%
85-68-7	Butyl benzyl phthalate	3,300	2,500	76 %	3,300	2,700	81 %	6 %	40 - 140 %	25%
91-94-1	3,3'-Dichlorobenzidine	3,300	3,000	90 %	3,300	2,800	85 %	6 %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	3,300	2,500	74 %	3,300	2,600	78 %	6 %	40 - 140 %	25%
218-01-9	Chrysene	3,300	2,500	74 %	3,300	2,600	78 %	6 %	40 - 140 %	25%
117-81-7	Bis(2-ethylhexyl) phthalate	3,300	2,500	76 %	3,300	2,700	81 %	7 %	40 - 140 %	25%
117-84-0	Di-n-octyl phthalate	3,300	2,500	75 %	3,300	2,600	79 %	6 %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	3,300	2,400	71 %	3,300	2,500	75 %	5 %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	3,300	2,400	73 %	3,300	2,600	78 %	6 %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	3,300	2,400	73 %	3,300	2,600	77 %	5 %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	3,300	2,400	72 %	3,300	2,500	76 %	5 %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	3,300	2,500	74 %	3,300	2,600	79 %	6 %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	3,300	2,500	75 %	3,300	2,600	79 %	5 %	40 - 140 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
2-Fluorophenol	13,000	8,200	61 %	13,000	8,300	62 %		30 - 130 %
Phenol-d5	13,000	8,700	65 %	13,000	8,800	66 %		30 - 130 %
Nitrobenzene-d5	6,700	4,500	68 %	6,700	4,600	69 %		30 - 130 %
2-Fluorobiphenyl	6,700	4,600	69 %	6,700	4,700	71 %		30 - 130 %
2,4,6-Tribromophenol	13,000	11,000	81 %	13,000	11,000	83 %		30 - 130 %
Terphenyl-d14	6,700	4,400	67 %	6,700	4,800	71 %		30 - 130 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample extraction performed by EPA Method 3545.

**Report Notations:** All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◇ Analyzed as Azobenzene.

## Quality Control Report Method Blank

Category: **EPA Method 8270C**  
QC Batch ID: **SV-2361-P**  
Matrix: **Soil**

Instrument ID: **MS-12 Agilent 6890**  
Extracted: **06-29-10 11:00**  
Analyzed: **06-30-10 18:42**  
Analyst: **MJB**

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CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
62-75-9	N-Nitrosodimethylamine	BRL		ug/Kg	330
110-86-1	Pyridine	BRL		ug/Kg	330
108-95-2	Phenol	BRL		ug/Kg	330
62-53-3	Aniline	BRL		ug/Kg	330
111-44-4	Bis(2-chloroethyl) ether	BRL		ug/Kg	330
95-57-8	2-Chlorophenol	BRL		ug/Kg	330
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	330
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	330
100-51-6	Benzyl Alcohol	BRL		ug/Kg	670
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	330
95-48-7	2-Methylphenol	BRL		ug/Kg	330
108-60-1	Bis(2-chloroisopropyl) ether	BRL		ug/Kg	330
108-39-4/106-44-5	3 and 4-Methylphenol *	BRL		ug/Kg	330
621-64-7	N-Nitrosodi-n-propylamine	BRL		ug/Kg	330
98-86-2	Acetophenone	BRL		ug/Kg	330
67-72-1	Hexachloroethane	BRL		ug/Kg	330
98-95-3	Nitrobenzene	BRL		ug/Kg	330
78-59-1	Isophorone	BRL		ug/Kg	330
88-75-5	2-Nitrophenol	BRL		ug/Kg	330
105-67-9	2,4-Dimethylphenol	BRL		ug/Kg	330
111-91-1	Bis(2-chloroethoxy) methane	BRL		ug/Kg	330
120-83-2	2,4-Dichlorophenol	BRL		ug/Kg	330
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	330
91-20-3	Naphthalene	BRL		ug/Kg	330
106-47-8	4-Chloroaniline	BRL		ug/Kg	330
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	330
59-50-7	4-Chloro-3-methylphenol	BRL		ug/Kg	330
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	330
77-47-4	Hexachlorocyclopentadiene	BRL		ug/Kg	670
88-06-2	2,4,6-Trichlorophenol	BRL		ug/Kg	330
95-95-4	2,4,5-Trichlorophenol	BRL		ug/Kg	330
91-58-7	2-Chloronaphthalene	BRL		ug/Kg	330
88-74-4	2-Nitroaniline	BRL		ug/Kg	330
100-25-4	1,4-Dinitrobenzene	BRL		ug/Kg	330
131-11-3	Dimethyl phthalate	BRL		ug/Kg	330
99-65-0	1,3-Dinitrobenzene	BRL		ug/Kg	330
208-96-8	Acenaphthylene	BRL		ug/Kg	330
606-20-2	2,6-Dinitrotoluene	BRL		ug/Kg	330
528-29-0	1,2-Dinitrobenzene	BRL		ug/Kg	330
99-09-2	3-Nitroaniline	BRL		ug/Kg	330
83-32-9	Acenaphthene	BRL		ug/Kg	330
51-28-5	2,4-Dinitrophenol	BRL		ug/Kg	670
100-02-7	4-Nitrophenol	BRL		ug/Kg	330
132-64-9	Dibenzofuran	BRL		ug/Kg	330
121-14-2	2,4-Dinitrotoluene	BRL		ug/Kg	330
84-66-2	Diethyl phthalate	BRL		ug/Kg	330
7005-72-3	4-Chlorophenyl phenyl ether	BRL		ug/Kg	330
86-73-7	Fluorene	BRL		ug/Kg	330
100-01-6	4-Nitroaniline	BRL		ug/Kg	330

## Quality Control Report Method Blank

Category: **EPA Method 8270C**  
QC Batch ID: **SV-2361-P**  
Matrix: **Soil**

Instrument ID: **MS-12 Agilent 6890**  
Extracted: **06-29-10 11:00**  
Analyzed: **06-30-10 18:42**  
Analyst: **MJB**

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CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
534-52-1	4,6-Dinitro-2-methylphenol	BRL		ug/Kg	330
86-30-6	N-Nitrosodiphenylamine <sup>†</sup>	BRL		ug/Kg	330
122-66-7	1,2-Diphenylhydrazine <sup>◊</sup>	BRL		ug/Kg	330
101-55-3	4-Bromophenyl phenyl ether	BRL		ug/Kg	330
118-74-1	Hexachlorobenzene	BRL		ug/Kg	330
87-86-5	Pentachlorophenol	BRL		ug/Kg	330
85-01-8	Phenanthrene	BRL		ug/Kg	330
120-12-7	Anthracene	BRL		ug/Kg	330
86-74-8	Carbazole	BRL		ug/Kg	330
84-74-2	Di- <i>n</i> -butyl phthalate	BRL		ug/Kg	330
206-44-0	Fluoranthene	BRL		ug/Kg	330
129-00-0	Pyrene	BRL		ug/Kg	330
85-68-7	Butyl benzyl phthalate	BRL		ug/Kg	330
91-94-1	3,3'-Dichlorobenzidine	BRL		ug/Kg	330
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	330
218-01-9	Chrysene	BRL		ug/Kg	330
117-81-7	Bis(2-ethylhexyl) phthalate	BRL		ug/Kg	330
117-84-0	Di- <i>n</i> -octyl phthalate	BRL		ug/Kg	330
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	330
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	330
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	330
193-39-5	Indeno[1,2,3- <i>c,d</i> ]pyrene	BRL		ug/Kg	330
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	330
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	330

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	13,000	7,400	55 %	30 - 130 %
Phenol-d5	13,000	7,900	59 %	30 - 130 %
Nitrobenzene-d5	6,700	4,300	65 %	30 - 130 %
2-Fluorobiphenyl	6,700	4,300	64 %	30 - 130 %
2,4,6-Tribromophenol	13,000	7,500	56 %	30 - 130 %
Terphenyl-d14	6,700	4,600	69 %	30 - 130 %

**Method Reference:** Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).  
Sample extraction performed by EPA Method 3545.

**Report Notations:** BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

\* Analyzed as 4-Methylphenol.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◊ Analyzed as Azobenzene.

## Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states. Copies of our current certificates may be obtained from our website:

<http://www.groundwateranalytical.com/qualifications.htm>

### CONNECTICUT

**Department of Health Services, PH-0586**

Potable Water, Wastewater, Solid Waste and Soil

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/Out\\_State.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/Out_State.pdf)

### MASSACHUSETTS

**Department of Environmental Protection, M-MA-103**

Potable Water and Non-Potable Water

<http://public.dep.state.ma.us/labcert/labcert.aspx>

**Department of Labor,**

Asbestos Analytical Services, Class A

**Division of Occupational Safety, AA000195**

[http://www.mass.gov/dos/forms/la-rpt\\_list\\_aa.pdf](http://www.mass.gov/dos/forms/la-rpt_list_aa.pdf)

### NEW HAMPSHIRE

**Department of Environmental Services, 202708**

Potable Water, Non-Potable Water, Solid and Chemical Materials

<http://www4.egov.nh.gov/DES/NHELAP>

### NEW YORK

**Department of Health, 11754**

Potable Water, Non-Potable Water, Solid and Hazardous Waste

<http://www.wadsworth.org/labcert/elap/comm.html>

### RHODE ISLAND

**Department of Health,**

Potable and Non-Potable Water Microbiology, Organic and Inorganic Chemistry

**Division of Laboratories, LAO00054**

<http://www.health.ri.gov/labs/outofstatelabs.pdf>

### U.S. DEPARTMENT OF AGRICULTURE

**USDA, Soil Permit, S-53921**

Foreign soil import permit

### VERMONT

**Department of Health, VT-87643**

Potable Water

[http://healthvermont.gov/enviro/ph\\_lab/water\\_test.aspx#cert](http://healthvermont.gov/enviro/ph_lab/water_test.aspx#cert)



## Certifications and Approvals

**MASSACHUSETTS**
**Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

**Potable Water (Drinking Water)**

Analyte	Method
1,2-Dibromo-3-Chloropropane	EPA 504.1
1,2-Dibromoethane	EPA 504.1
Alkalinity, Total	SM 2320-B
Antimony	EPA 200.8
Arsenic	EPA 200.8
Barium	EPA 200.7
Barium	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chlorine, Residual Free	SM 4500-CL-G
Chromium	EPA 200.7
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
E. Coli (Treatment and Distribution)	Enz. Sub. SM 9223
E. Coli (Treatment and Distribution)	NA-MUG SM 9222-G
Fecal Coliform (Source Water)	MF SM 9222-D
Fluoride	EPA 300.0
Fluoride	SM 4500-F-C
Heterotrophic Plate Count	SM 9215-B
Lead	EPA 200.8
Mercury	EPA 245.1
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Nitrite-N	EPA 300.0
Nitrite-N	Lachat 10-107-04-1-C
pH	SM 4500-H-B
Selenium	EPA 200.8
Silver	EPA 200.7
Silver	EPA 200.8
Sodium	EPA 200.7
Sulfate	EPA 300.0
Thallium	EPA 200.8
Total Coliform (Treatment and Distribution)	Enz. Sub. SM 9223
Total Coliform (Treatment and Distribution)	MF SM 9222-B
Total Dissolved Solids	SM 2540-C
Trihalomethanes	EPA 524.2
Turbidity	SM 2130-B
Volatile Organic Compounds	EPA 524.2

**Non-Potable Water (Wastewater)**

Analyte	Method
Aldrin	EPA 608
Alkalinity, Total	SM 2320-B
Alpha-BHC	EPA 608
Aluminum	EPA 200.7
Ammonia-N	Lachat 10-107-06-1-B

**Non-Potable Water (Wastewater)**

Analyte	Method
Antimony	EPA 200.7
Antimony	EPA 200.8
Arsenic	EPA 200.7
Arsenic	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Beta-BHC	EPA 608
Biochemical Oxygen Demand	SM 5210-B
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chemical Oxygen Demand	SM 5220-D
Chlordane	EPA 608
Chloride	EPA 300.0
Chlorine, Total Residual	SM 4500-CL-G
Chromium	EPA 200.7
Chromium	EPA 200.8
Cobalt	EPA 200.7
Cobalt	EPA 200.8
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
DDD	EPA 608
DDE	EPA 608
DDT	EPA 608
Delta-BHC	EPA 608
Dieldrin	EPA 608
Endosulfan I	EPA 608
Endosulfan II	EPA 608
Endosulfan Sulfate	EPA 608
Endrin	EPA 608
Endrin Aldehyde	EPA 608
Fluoride	EPA 300.0
Gamma-BHC	EPA 608
Hardness (CaCO <sub>3</sub> ), Total	EPA 200.7
Hardness (CaCO <sub>3</sub> ), Total	SM 2340-B
Heptachlor	EPA 608
Heptachlor Epoxide	EPA 608
Iron	EPA 200.7
Kjeldahl-N	Lachat 10-107-06-02-D
Lead	EPA 200.7
Magnesium	EPA 200.7
Manganese	EPA 200.7
Manganese	EPA 200.8
Mercury	EPA 245.1
Molybdenum	EPA 200.7
Molybdenum	EPA 200.8
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Non-Filterable Residue	SM 2540-D
Oil and Grease	EPA 1664

## Certifications and Approvals

**MASSACHUSETTS****Department of Environmental Protection, M-MA-103**

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**Non-Potable Water (Wastewater)**

<b>Analyte</b>	<b>Method</b>
Orthophosphate	Lachat 10-115-01-1-A
pH	SM 4500-H-B
Phenolics, Total	EPA 420.4
Phenolics, Total	Lachat 10-210-00-1-B
Phosphorus, Total	Lachat 10-115-01-1-C
Phosphorus, Total	SM 4500-P-B,E
Polychlorinated Biphenyls (Oil)	EPA 600/4-81-045
Polychlorinated Biphenyls (Water)	EPA 608
Potassium	EPA 200.7
Selenium	EPA 200.7
Selenium	EPA 200.8
Silver	EPA 200.7
Sodium	EPA 200.7
Specific Conductivity	SM 2510-B
Strontium	EPA 200.7
Sulfate	EPA 300.0
SVOC-Acid Extractables	EPA 625
SVOC-Base/Neutral Extractables	EPA 625
Thallium	EPA 200.7
Thallium	EPA 200.8
Titanium	EPA 200.7
Total Dissolved Solids	SM 2540-C
Total Organic Carbon	SM 5310-B
Toxaphene	EPA 608
Vanadium	EPA 200.7
Vanadium	EPA 200.8
Volatile Aromatics	EPA 602
Volatile Aromatics	EPA 624
Volatile Halocarbons	EPA 624
Zinc	EPA 200.7
Zinc	EPA 200.8