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September 14, 2017

Mr. Brian Majka GEI Consultants of Michigan, P.C. 5225 Edgewater Drive Allendale, MI 49401

Phone: (616) 384-2710

RE: Trace Project T17I163

Client Project GEI - 1

Dear Mr. Majka:

Enclosed are your analytical results. The results of this report relate only to the samples listed in the body of this report.

All reports were examined through Trace's validation process to ensure that requirements for quality and completeness were satisfied. All reported analytical results were obtained in accordance with the methods referenced on the reports. Every practical effort was made to meet the reporting limit specifications for this work, however, some results may have raised reporting limits to correct for percent solids.

For clients that require NELAC Accreditation, Trace certifies that these test results meet all requirements of the NELAC Standard, except for those analytes with a "N" notation. These analytes have not been evaluated by NELAC at Trace's discretion and will not be reported unless requested by client.

If you have questions concerning this report, please contact me at 231.773.5998 or by email at jmink@trace-labs.com.

Sincerely,

Jon Mink Senior Project Manager

Enclosures





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### **SAMPLE SUMMARY**

Trace Project ID: T17I163
Client Project ID: GEI - 1

Trace ID	Sample ID	Matrix	Collected By	Date Collected	Date Received
T17I163-01	GEI - 1	Soil	Client	09/11/17 15:30	09/11/17 15:46



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#### AN EXPLANATION OF TERMS AND SYMBOLS WHICH MAY OCCUR IN THIS REPORT

## **DEFINITIONS**

LCS Laboratory Control Sample

LCSD Laboratory Control Sample Duplicate

MS Matrix Spike

MSD Matrix Spike Duplicate
RPD Relative Percent Difference

DUP Matrix Duplicate

RDL Reporting Detection Limit
MCL Maximum Contamination Limit
TIC Tentatively Identified Compound

<, ND or U Indicates the compound was analyzed for but not detected

\* Indicates a result that exceeds its associated MCL or Surrogate control limits

N Indicates that the compound has not been evaluated by NELAC

NA Indicates that the compound is not available.

NOTE: Samples for volatiles that have been extracted with a water miscible solvent were corrected for the

total volume of the solvent/water mixture.

Solid matrices Method Blanks are at 100% solids as such results are the same wet or dry.



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### **ANALYTICAL RESULTS**

Trace Project ID: T17I163
Client Project ID: GEI - 1

Date Collected: 09/11/17 15:30 Trace ID: T17I163-01 Matrix: Soil Sample ID: **GEI - 1** Date Received: 09/11/17 15:46 **PARAMETERS RESULTS UNITS** DILUTION PREPARED BY **ANALYZED** BY **NOTES** MCL RDI **VOLATILE ORGANIC COMPOUNDS BY GC-MS** Analysis Method: EPA 8260B Batch: T071922 <320 ug/kg dry 320 50 09/13/17 09/14/17 Methyl-tert-butyl ether was was Benzene <65 ug/kg dry 65 50 09/13/17 was 09/14/17 was 1,2-Dichloroethane <65 ug/kg dry 65 50 09/13/17 09/14/17 was was 09/14/17 Toluene <100 ug/kg dry 100 50 09/13/17 was was 1,2-Dibromoethane (EDB) <65 ug/kg dry 65 50 09/13/17 09/14/17 was <65 ug/kg dry Ethylbenzene 65 50 09/13/17 was 09/14/17 was m,p-Xylene <130 ug/kg dry 130 50 09/13/17 was 09/14/17 was Ν o-Xylene <65 ug/kg dry 65 50 09/13/17 09/14/17 Ν <190 ug/kg dry Xylenes, total 190 50 09/13/17 09/14/17 was was 1,3,5-Trimethylbenzene <100 ug/kg dry 100 50 09/13/17 09/14/17 was was 1,2,4-Trimethylbenzene <100 ug/kg dry 100 50 09/13/17 09/14/17 was was Naphthalene <330 ug/kg dry 330 50 09/13/17 09/14/17 Ν was was 09/14/17 2-Methylnaphthalene <330 ug/kg dry 330 50 09/13/17 was was Ν Surrogates: 68-133 100 % 50 09/13/17 09/14/17 1,2-Dichloroethane-d4 was was Toluene-d8 100 % 75-120 50 09/13/17 09/14/17 was was 4-Bromofluorobenzene 98 % 69-119 50 09/13/17 09/14/17 was was 1,2-Dichlorobenzene-d4 98 % 72-127 50 09/13/17 09/14/17 was was **VOLATILE ORGANIC COMPOUNDS BY GC** Analysis Method: EPA 8015B Batch: T071934 **Gasoline Range Organics (TPH)** 11 mg/kg dry 50 09/14/17 09/14/17 4.0 was was Surrogates:

#### **CERTIFICATE OF ANALYSIS**

103 %

82-137

50

09/14/17

was

09/14/17

Ν

was

Fluorobenzene



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### **ANALYTICAL RESULTS**

Trace Project ID: T17I163
Client Project ID: GEI - 1

Trace ID: T171163-01 Date Collected: 09/11/17 15:30 Matrix: Soil

Sample ID: GEI - 1 Date Received: 09/11/17 15:46

PARAMETERS RESULTS UNITS RDL DILUTION PREPARED BY ANALYZED BY NOTES MCL

WET CHEMISTRY

Analysis Method: ASTM D2974-87

Batch: T071874

% Solids 84 % by Wt. 0.10 1 09/13/17 nm 09/14/17 nm N



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#### **QUALITY CONTROL RESULTS**

Trace Project ID: T17I163 Client Project ID: GEI - 1

QC Batch: T071934

Analysis Description: Gasoline Range Organics

QC Batch Method: EPA 8015B

Analysis Method: EPA 8015B

#### METHOD BLANK: T071934-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Gasoline Range Organics (TPH)	mg/kg wet	<4.0	4.0	
Fluorobenzene (S)	%	107	82-137	

### LABORATORY CONTROL SAMPLE: T071934-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Gasoline Range Organics (TPH)	mg/kg wet	20.0	19.9	100	80-120	
Fluorobenzene (S)	%	40.0	42.7	107	82-137	

Trace Project ID: T17I163 Client Project ID: GEI - 1

QC Batch: T071922

Analysis Description: Volatiles, OpMemo14 full list

QC Batch Method: EPA 5035 Purge-and-Trap for Solids and

Analysis Method: EPA 8260B

vvasios

## METHOD BLANK: T071922-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Methyl-tert-butyl ether	ug/kg wet	<250	250	
Benzene	ug/kg wet	<50	50	
1,2-Dichloroethane	ug/kg wet	<50	50	
Toluene	ug/kg wet	<100	100	
1,2-Dibromoethane (EDB)	ug/kg wet	<50	50	
Ethylbenzene	ug/kg wet	<50	50	
m,p-Xylene	ug/kg wet	<100	100	
o-Xylene	ug/kg wet	<50	50	
Xylenes, total	ug/kg wet	<150	150	
1,3,5-Trimethylbenzene	ug/kg wet	<100	100	
1,2,4-Trimethylbenzene	ug/kg wet	<100	100	
Naphthalene	ug/kg wet	<330	330	
2-Methylnaphthalene	ug/kg wet	<330	330	
1,2-Dichloroethane-d4 (S)	%	103	68-133	
Toluene-d8 (S)	%	103	75-120	
4-Bromofluorobenzene (S)	%	101	69-119	
1,2-Dichlorobenzene-d4 (S)	%	101	72-127	

### **CERTIFICATE OF ANALYSIS**

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## LABORATORY CONTROL SAMPLE: T071922-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Benzene	ug/kg wet	1000	992	99	80-120	
Toluene	ug/kg wet	1000	966	97	80-120	
1,2-Dichloroethane-d4 (S)	%	50.0	50.9	102	68-133	
Toluene-d8 (S)	%	50.0	47.8	96	75-120	
4-Bromofluorobenzene (S)	%	50.0	51.8	104	69-119	
1,2-Dichlorobenzene-d4 (S)	%	50.0	51.1	102	72-127	

Trace Project ID: T17I163 Client Project ID: GEI - 1

QC Batch: T071874
QC Batch Method: % Solids

Analysis Description: Solids, Dry Weight Analysis Method: ASTM D2974-87

SAMPLE DUPLICATE: T071874-DUP1 Original: T17I163-01

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Notes
% Solids	% by Wt.	83.7	83.6	0.04	20	



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<u>ال</u>	leas	3e S	ign Released By						1 9/11/17 3:30	Trace Date Time No. Collected Collected	Project Name:	4 Day* 22 3 Day* *Requires Prior Approval	Turnaround Requirements: ☐ Standard ☐ 48 H	Email Address: Smajka	Office Phone:	City, State, Zip Code: All 2020	Mailing Address: S225	Report To: Srian May	Company Name: (55%)	Report Results To:	ANALYTICAL LA	
In executing this Chain of C	1		By Received By						GET 1	Client Sample ID		Hour	its: Matrix Key:  8 Hour* S = Soil / Solid	(e) ges consultants.com	Cell Phone:	Me M MANUI	SDS Educate Dr	ta	Consultants Enc		ANALYTICAL LABORATORIES, INC.	
In executing this Chain of Custody, the client acknowledges the terms as set forth at www.trace-labs.com/terms-of-agreen		- 154h 2	Date Time				7.			Metals Field Filtered (Y / N Matrix Number of Containers Cool HCI HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaOH Other	Sampled By:		d WI = Wines	Billing Email Address:	Phone Number:	City, State, Zip Code:	Billing Address (if different):	Contact Name:	PO#	Bill To:	Trace Analytical Laboratories, Inc. 2241 Black Creek Road Muskegon, MI 49444-2673	
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reement.			Received By										Analysis Requested		Sampling Time:	меОН С	Soil Volatiles Preserved (circle if applicable):	Checked By:	Logged By:	Trace Use:	1. Tr	
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			Time		 	 				Possible Hea						Lab	able):				$\sim$	

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Trace ID #:	escription: Buck Temperature: 20
Client Name: Time: 1/2	116
Time: 177	Logged in by:
	,
Cooler Receipt	
Cooler/samples delivered by: Trace courier	
	of delivery person:
Commercial courier UPS UPS	FED EX US Mail
Tracking Number: Not Applicable	
√racking #:	·····
COC Seals present and intact on cooler? Not Applicable No	Yes
Custody seals signed by Client? No Yes Client cus	stody seal # (if applicable):
Coolant and Tempera	ture
Type of Coolant Used	Cooler Temperature
Slurry w/ crushed, cubed, or chip ice? Correction Factors: •D	igital Stick Thermometer CF = -0.6°C
	Thermometer CF = -0,4°C
Ice Packs/ Blue Ice : Representative Sample To	$\alpha / \gamma$
	nk (Stick Thermometer)
7-1	mple (IR Thermometer)
Yes No (N/A) Melt Water: 14 0 (	°C (Use Digital Stick Thermometer)
General	
Yes No NA	Comments
All bottles arrived unbroken with labels in good condition?	
Each sample point is in a sealed plastic bag?	
Labels filled out completely?	
All bottle labels agree with Chain of Custody (COC)?	
Sufficient sample to run tests requested?	
pH checked and samples at correct pH? Sec	e Below*
Correct preservative added to samples?	
Air bubbles absent from VOAs?	
COC filled out properly and signed by client?	
COC signed in by TRACE sample custodian?	
Was project manager called and samples discussed?	7 / Y 2 / Y 2 / Y 3 / Y
Notes:	*EMD pH Test Strips Used:
	pH 0-2.5 pH 11.0-13.0
	Lot: HC563733 Lot: HC547328
€ <sub>c</sub>	Other:
*	
	Lot: HC563733 verified 6/21/16 AY

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phone toll-free fax 231.773.5998 800.733.5998 231.773.6537 Trace Analytical Laboratories, Inc. 2241 Black Creek Road Muskegon, MI 49444-2673 info@trace-labs.com www.trace-labs.com

# Lab Weight Check - Methanol/DI Water Preserved Soils

Trace ID: Client: GEL

Sample ID	Weight of VOA and MeOH or DI (g)	Weight of VOA, MeOH or DI & Soil (g)	Bottle and MeOH or DI LIMS#	Amount of Soil added (g)
TMI163-01C	33.03	4/3.93	17A1807	
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Lab Use:	Sample	Weight	Checked	Ву:_	
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Balance Used:

Form 70-N.2 Effective 8/11/15

F:\Support Documentation Worksheets\70-Sample Receiving\70-N.2 Lab Weight Check for Methanol Preserved Soils.doc

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