

February 7, 2008  
File No. 21.0056372.0

Mr. Richard Eisenman  
Delphi Automotive Systems LLC  
1000 Lexington Ave  
Rochester, New York



Re: Downgradient Monitoring Well Installation/Sampling  
Delphi Thermal Systems Facility  
Lockport, New York

Dear Mr. Eisenman:

GZA GeoEnvironmental of New York (GZA) prepared this letter report to summarize the results of the additional downgradient groundwater monitoring well installation and sampling we did at the above referenced Site. This work was done pursuant to our October 9, 2007 proposal and October 11, 2007 Work Plan<sup>1</sup>. The Work Plan was provided to Mr. Glenn May of the New York State Department of Environmental Conservation (NYSDEC) for review and comment. GZA received an electronic transmission from NYSDEC on October 26, 2007 which indicated there were no comments on the Work Plan.

The purpose of the downgradient monitoring wells is to assess if contaminated groundwater is migrating at downgradient locations (eastern portion of the property) not previously investigated.

## **GROUNDWATER MONITORING WELL INSTALLATION**

GZA oversaw the installation of five bedrock groundwater monitoring wells by our drilling subcontractor, Earth Dimensions Inc. from October 31 to November 8, 2007. These wells were installed on the eastern portion of the Delphi Lockport Complex as shown on Figure 1 in Attachment 1. The wells were designated MW-6-1; MW-6-2; MW-7-1; MW-7-2 and MW-7-3. The monitoring wells were installed into bedrock consistent with methodologies used as part of the remedial investigation work previously done (NYSDEC approved Focused Remedial Investigation and Focused Feasibility Study (FRI/FFS) Work Plan dated April 2001) in this portion of the Lockport Complex and pursuant to our October 11, 2007 Work Plan. The boring/well installation logs are included in Attachment 2.

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<sup>1</sup> Letter to Mr. Glenn May, NYSDEC: "Work Plan for Downgradient Monitoring Installation, Eastern portion of Delphi Lockport Facility, Lockport, New York" dated October 11, 2007.

## MONITORING WELL DEVELOPMENT, MEASUREMENT & HYDRAULIC CONDUCTIVITY TESTING

GZA developed the monitoring wells to remove the drill cuttings, develop the filter sand pack and verify that the monitoring wells are functioning properly. The well development occurred on November 16, 2007 around 8 days after the monitoring wells were installed.



GZA used an 1.75-inch diameter stainless steel slug to agitate or surge the monitoring wells prior to groundwater removal as part of the development. A disposable polyethylene bailer was used to develop the monitoring wells. The following amount of groundwater was generated during the development of the monitoring wells and drummed for disposal by Delphi.

- MW-6-1: Well went “dry” after removal of approximately 5 gallons (2.5 well volumes)
- MW-6-2: Purged approximately 30 gallons (10 well volumes)
- MW-7-1: Well went “dry” after removal of approximately 4 gallons (1.5 well volumes)
- MW-7-2: Well went “dry” after removal of approximately 4 gallons (2 well volumes)
- MW-7-3: Well went “dry” after removal of approximately 5.5 gallons (2.5 well volumes)

In addition to and following development of the monitoring wells, GZA perform hydraulic conductivity testing using the rising head method<sup>2</sup>. GZA calculated the effective hydraulic conductivities for four of the five newly installed wells. The recovery in monitoring well, MW-7-1, was slow and not practical to measure (e.g., water level increase approximately 3 feet in 8 days). The following hydraulic conductivities were calculated for the other four wells (see calculation spreadsheets in Attachment 3).

- MW-6-1:  $2.4 \times 10^{-5}$  centimeters per second (cm/s)
- MW-6-2:  $1.3 \times 10^{-5}$  cm/s
- MW-7-2:  $4.5 \times 10^{-5}$  cm/s
- MW-7-3:  $2.7 \times 10^{-6}$  cm/s

The monitoring points (top or riser) of the five newly installed wells were measured relative to the existing monitoring well elevations established during the previous investigations. The monitoring point elevations for the five new wells are as follows.

- MW-6-1: 598.23 ft
- MW-6-2: 609.33 ft
- MW-7-1: 597.98 ft
- MW-7-2: 592.57 ft

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<sup>2</sup> Bouwer, H. 1989. “The Bouwer and Rice Slug Test – An Update”. Groundwater Journal, Vol. 27., No. 3. May-June 1989.

- MW-7-3: 594.04 ft

In addition to measuring the monitoring point elevations of the newly installed wells, GZA completed a round of groundwater measurements from the numerous monitoring wells across the Site, to assess groundwater flow. Twenty-two well locations were measured on January 8, 2007 in the development of the groundwater contour map shown on Figure 2 in Attachment 1. The groundwater flow direction is generally in an eastern direction across the Site.



The groundwater measurements from monitoring wells MW-7-A-6 and MW-7-1 were not used in the development of the contour map. The road box and j-plug on MW-7-A-6, had been destroyed/removed by plowing activities in the area. The well was exposed and its groundwater level was high (1.66 feet below top of riser), likely due to runoff from the significant snow melt that occurred in the days prior to measuring the water level. The road box for MW-7-A-6 has been replaced with a new one. The measurement from MW-7-1 (19.16 feet below top of riser) was not used due to the slow recharge of this well. GZA returned to the Site on January 16, 2007 and re-measured the depth to groundwater and found the level had increased approximately 3 feet (16.06 feet below top of riser).

## **MONITORING WELL GROUNDWATER SAMPLING**

GZA waited approximately two weeks after the monitoring well development to collect groundwater samples from the five monitoring wells. Low-flow sampling methodologies consistent with those outlined in the Operations, Monitoring & Maintenance Plan in the Site Management Plan dated August 2007 were used to collect the groundwater samples on November 29 and 30, 2007. The five groundwater samples collected were submitted to Free-Col Laboratories for analytical testing for volatile organic compounds (VOCs) via EPA Method 8260 Target Analyte List (TCL). Table 1 in Attachment 1 is a summary of the analytical results. The laboratory report is included in Attachment 4.

VOCs were detected in two of the five monitoring wells (MW-6-2 and MW-7-1). Trichloroethylene (TCE) was the only VOC detected above method detection limits in the sample collected from MW-6-2. TCE was detected at a concentration of 25 parts per billion (ppb), which exceeds its respective Class GA<sup>3</sup> groundwater criteria of 5 ppb.

Four VOCs; TCE (110 ppb), 1,2-dichloroethenes (total) (8 ppb), benzene (3 ppb) and toluene (7 ppb) were detected at a concentration above their method detection limits in the sample collected from MW-7-1. The detected concentrations of the four compounds exceed their respective Class GA groundwater criteria of 5 ppb, 5 ppb, 1 ppb and 5 ppb.

As mentioned earlier, no VOCs were detected above method detection limits in the groundwater samples analyzed from MW-6-1, MW-7-2 and MW-7-3.

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<sup>3</sup> Division of Water Technical and Operational Guidance Series (1.1.1) "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" prepared by the New York State Department of Environmental Conservation, dated October 1993, revised 1998, ERRATA Sheet dated January 1999; and Addendum dated April 2000.

GZA recommends that the newly installed monitoring wells be resampled in the Spring of 2008, prior to making a decision on additional on or off-Site work based on the presented analytical results.




Please do not hesitate to contact the undersigned if you have any questions or require any additional information.

Sincerely,

GZA GEOENVIRONMENTAL

  
Christopher Boron  
Project Manager

  
Ernest R. Hanna, P.E.  
Principal

Attachment 1: Figure 1 – New Downgradient Monitoring Well Locations  
Figure 2 – January 8, 2007 Groundwater Contour Map  
Table 1 – Summary of Groundwater Sample Result

Attachment 2: Boring & Monitoring Well Installation Logs

Attachment 3: Hydraulic Conductivity Calculation Spreadsheets

Attachment 4: Free Col Laboratories Analytical Report

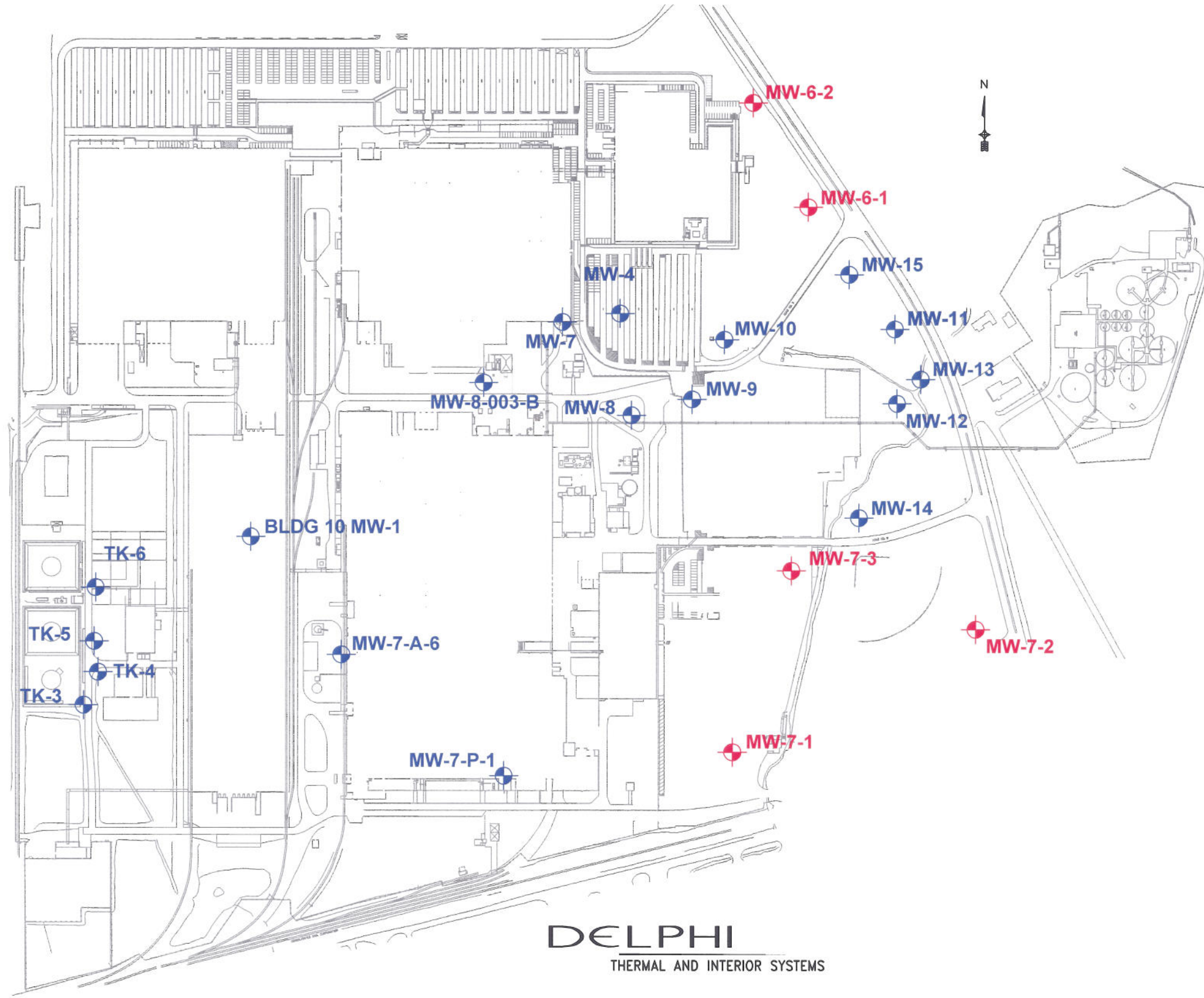
**ATTACHMENT 1**  
**TABLE & FIGURES**

**Table 1**  
 Groundwater Analytical Testing Results Summary  
 Additional Downgradient Groundwater Monitoring Wells  
 Delphi Lockport Complex  
 Lockport, New York

Parameter	NYSDEC Class GA Criteria	MW-6-1	MW-6-2	MW-7-1	MW-7-2	MW-7-3
<b>VOC - EPA Method 8260 TCL (ug/L)</b>						
Benzene	1			<b>3</b>		
1,2-Dichloroethenes (total)	5			<b>8</b>		
Trichloroethylene	5		<b>25</b>	<b>110</b>		
Toluene	5			<b>7</b>		

**Notes:**

1. Compounds detected in one or more samples are presented on this table.
2. Analytical testing completed by Free-Col Laboratory. Samples were analyzed for volatile organic compounds (VOCs) via EPA Method 8260 Target Compound List (TCL), only.
3. NYSDEC Class GA criteria obtained from Division of Water Technical and Operational Guidance Series (TOGS 1.1.1), June 1998.
4. ug/L = part per billion (ppb).
5. Blank indicates compound was not detected.
6. **BOLD** values exceeding guidance criteria.



**DELPHI**  
THERMAL AND INTERIOR SYSTEMS

**LEGEND:**

- **MW-7-2** APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL INSTALLED NOVEMBER 2007.
- **MW-11** APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL INSTALLED PREVIOUSLY.

**NOTES:**

1. BASE MAP ADAPTED FROM A DRAWING PROVIDED BY DELPHI THERMAL AND INTERIOR SYSTEMS SEPT. 2007.
2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

DRAWN BY: DEW

DATE: JANUARY 2008

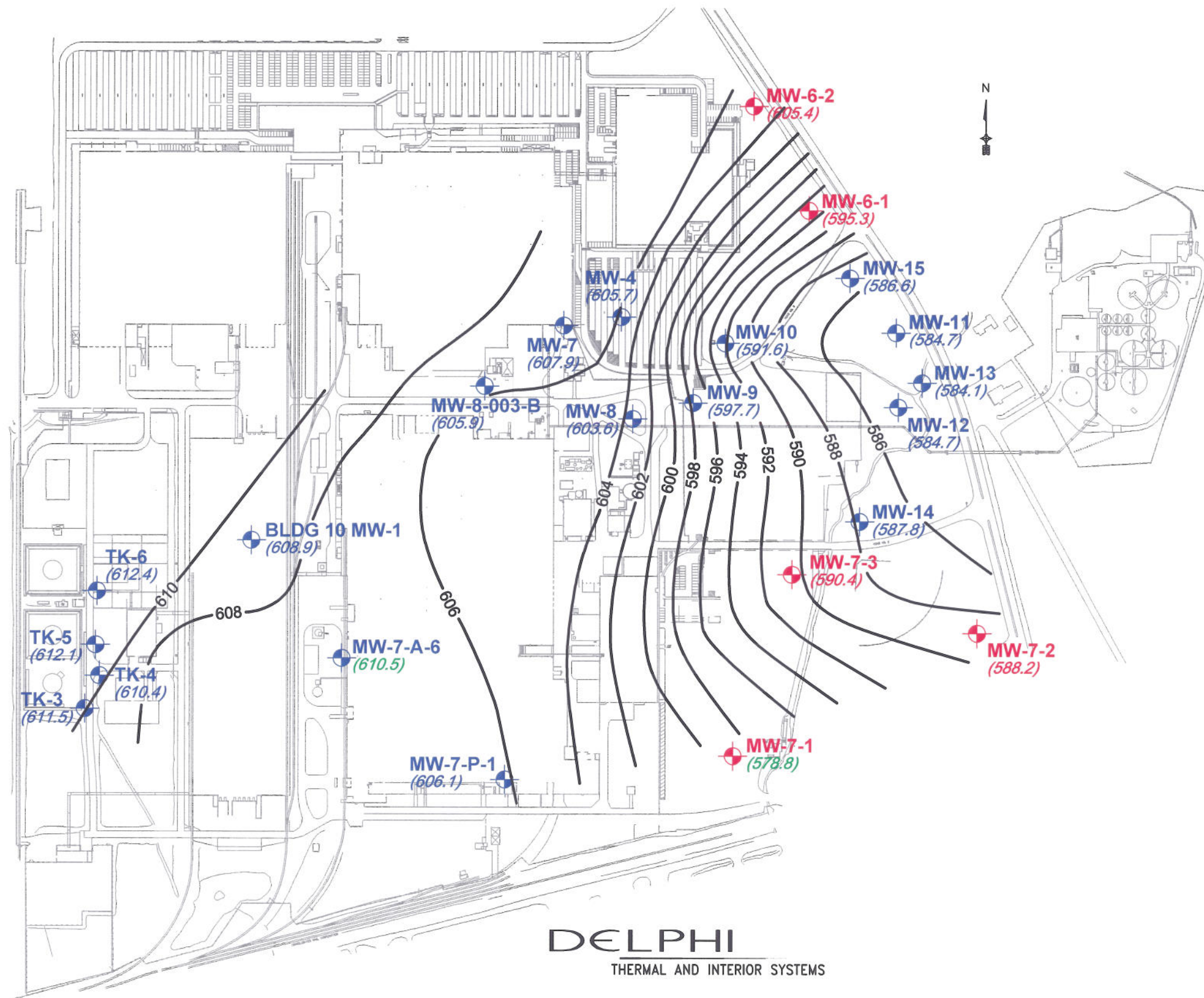
GZA GeoEnvironmental of  
New York



**DELPHI AUTOMOTIVE SYSTEMS**  
**DELPHI LOCKPORT FACILITY**  
200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK  
**MONITORING WELL INSTALLATION**  
**SITE PLAN**

PROJECT No.  
**21.0056372**

FIGURE No.  
**1**



**DELPHI**  
THERMAL AND INTERIOR SYSTEMS

**LEGEND:**

- MW-7-2 (588.2)** APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL INSTALLED NOVEMBER 2007, WITH GROUNDWATER ELEVATION MEASURED ON JANUARY 8, 2008
- MW-11 (584.7)** APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL INSTALLED PREVIOUSLY, WITH GROUNDWATER ELEVATION MEASURED ON JANUARY 8, 2008
- (610.5)** GROUNDWATER ELEVATION MEASURED ON JANUARY 8, 2008 NOT USED IN THE DEVELOPMENT OF GROUNDWATER CONTOURS
- 606** APPROXIMATE LOCATION AND ELEVATION OF GROUNDWATER CONTOUR LINE, BASED ON GROUNDWATER ELEVATIONS MEASURED ON JANUARY 8, 2008

**NOTES:**

1. BASE MAP ADAPTED FROM A DRAWING PROVIDED BY DELPHI THERMAL AND INTERIOR SYSTEMS SEPT. 2007.
2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

<p><b>DRAWN BY:</b> DEW <b>DATE:</b> JANUARY 2008</p>	<p><b>GZA GeoEnvironmental of New York</b></p>
<p>APPROXIMATE SCALE IN FEET</p>	
<p><b>DELPHI AUTOMOTIVE SYSTEMS</b> DELPHI LOCKPORT FACILITY 200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK <b>DOWNGRADE</b> MONITORING WELL INSTALLATION MONITORING WELL LOCATIONS AND JANUARY 8, 2008 GROUNDWATER CONTOURS</p>	
<p>PROJECT No. <b>21.0056372</b></p>	
<p>FIGURE No. <b>2</b></p>	



**ATTACHMENT 2**  
**BORING & MONITORING WELL INSTALLATION LOGS**

Delphi Automotive  
Additional Well Installation  
Lockport Complex  
Lockport, NY

CONTRACTOR		Earth Dimensions, Inc.		BORING LOCATION		See Location Plan	
DRILLER		Andy Morris		GROUND SURFACE ELEVATION		596.6 DATUM NGVD	
START DATE		11/1/2007		END DATE		11/8/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE		C. Boron					

WATER LEVEL DATA					TYPE OF DRILL RIG	
DATE	TIME	WATER	CASING	NOTES	CASING SIZE AND DIAMETER	OVERBURDEN SAMPLING METHOD
					CME-550	6-5/8" HSA
						2" diameter x 24" long spiltspoon
						5 7/8 Roller Bit-NQ Size Rock Core-3 7/8 Roller bit

DEPTH	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V M (ppm)
	BLOWS (/6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)				
1	3	S-1	0 - 2	17	70	TOPSOIL	<p>Top of Riser Elev. = 598.23 feet Concrete and Stickup Casing Cement/bentonite grout from 0 to 3 feet. 11" Nominal diameter borehole to 4.5' 4" Steel Casing to 6.5 feet. Bentonite Pellets from 3 to 6 ft. 2-inch PVC flush coupled riser pipe to 7 feet. 2-inch PVC Screen SCH. 40, 10 slot, from 7 to 17 feet. Sand pack from 6 to 17 feet. Nominal 4" diameter rock hole 6.5 to 17 feet.</p>	ND	
2	6					Brown Clayey SILT, trace Sand, little Gravel, moist. (FILL)		ND	
3	11	S-2	2 - 4	24	60	Dark brown Clayey SILT, trace Sand, trace Gravel, moist. (FILL)		ND	
4	12					Brown Clayey SILT, trace Sand, trace Gravel, moist. (Native)		ND	
5	100/3	S-3	4 - 4.3			Spiltspoon Refusal at 4.3 feet Auger Refusal at 4.5 feet		ND	
6								ND	
7		C-1	6.5 - 9	13	87	Rollerbit to 6.5 feet			
8						BEDROCK Lockport Dolomite Formation Gray, hard, very slight to slight weathering, fine grained, horizontal and low angle fractures.			
9									
10		C-2	9.0 - 16.5	63	97				
11									
12									
13									
14									
15									
16									
17						Rollerbit 16.5 to 17 feet			
18						End of boring at 17 feet bgs.			
19									

S - Split Spoon Sample	NOTES: 1) HNu PI - 101 organic vapor meter (OVM) used to screen soil samples. Meter was calibrated to the equivalent of 100 ppm isobutylene in air. 2) OVM reading from headspace screening of soil samples.
C - Rock Core Sample	

General	1) Stratification lines represent approximate boundary between soil types; transitions may be gradual.
Notes:	2) Water level readings have been made at times and under conditions stated; fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Delphi Automotive  
 Additional Well Installation  
 Lockport Complex  
 Lockport, NY

CONTRACTOR		Earth Dimensions, Inc.			BORING LOCATION		See Location Plan				
DRILLER		Andy Morris			GROUND SURFACE ELEVATION		607.6 DATUM NGVD				
START DATE		10/31/2007			END DATE		11/6/2007				
GZA GEOENVIRONMENTAL REPRESENTATIVE		C. Boron			TYPE OF DRILL RIG		CME-550				
WATER LEVEL DATA		DATE		TIME	WATER	CASING	NOTES	CASING SIZE AND DIAMETER		6-5/8" HSA	
								OVERBURDEN SAMPLING METHOD		2" diameter x 24" long splitspoon	
								ROCK DRILLING METHOD		5 7/8 Roller Bit-NQ Size Rock Core-3 7/8 Roller bit	
DEPTH	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V M		
	BLOWS (/6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)						
1	3	S-1	0 - 2	15	75	TOPSOIL	<p>Top of Riser Elev. = 609.33</p> <p>Concrete &amp; Stickup Casing</p> <p>Nominal 10" diameter borehole to 8.7 ft.</p> <p>Cement/bentonite grout from 2 to 8 feet.</p> <p>4" Steel Casing to 10 feet.</p> <p>2 inch PVC flush coupled riser pipe to 14.6 feet.</p> <p>Bentonite Pellets from 8 to 12.9 ft.</p> <p>Nominal 4" diameter rock hole 10 to 24.6 feet.</p>	ND			
	7					Brown Clayey SILT, trace Sand, trace Gravel, moist. (FILL)					
2	10					Dark brown SILT & CLAY, trace Sand, trace Gravel, moist. (Native)			ND		
3	11	S-2	2 - 4	27	60	Brown Clayey SILT, trace Sand, trace Gravel, moist.			ND		
4	16					Brown fine SAND and Silt, wet.			ND		
5	9		4 - 6	18	70	Brown SILT & CLAY, trace Sand, trace Gravel, wet.			ND		
6	9					Grades to... little Sand (lens), trace Gravel.			ND		
7	10		6 - 7.8	125	50	Splitspoon Refusal at 7.8 ft bgs Auger Refusal at 8.7 ft bgs			ND		
8	100/3					Roller bit to 10 feet bgs			ND		
9									ND		
10		C-1	10.0 - 19.5	87	93	BEDROCK			ND		
11						Lockport Dolomite Formation			ND		
12						Gray, hard, very slight to slight weathering, fine grained, horizontal and low angle fractures.					
13											
14											
15											
16											
17											
18											
19											
		C-2	19.5 - 24.5	76	96						

Delphi Automotive  
 Additional Well Installation  
 Lockport Complex  
 Lockport, NY

D E P T H	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V M  <small>(ppm)</small>
	BLOWS (/6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)				
20						BEDROCK LOCKPORT DOLOMITE FORMATION Gray, hard, slight to moderate weathering, fine-grained, horizontal and low angle fractures		Sandpack #00N from 12.9 to 24.6 feet  2 inch PVC Screen SCH. 40, 10 slot, from 14.6 to 24.6 feet.	
21									
22									
23									
24									
25					End of boring at 24.6 feet bgs.				
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
S - Split Spoon Sample C - Rock Core Sample					NOTES: 1) HNu PI - 101 organic vapor meter (OVM) used to screen soil samples. Meter was calibrated to the equivalent of 100 ppm isobutylene in air. 2) OVM reading from headspace screening of soil samples.				
General Notes:					1) Stratification lines represent approximate boundary between soil types; transitions may be gradual. 2) Water level readings have been made at times and under conditions stated; fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.				

Delphi Automotive  
 Additional Well Installation  
 Lockport Complex  
 Lockport, NY

CONTRACTOR		Earth Dimensions, Inc.		BORING LOCATION		See Location Plan	
DRILLER		Andy Morris		GROUND SURFACE ELEVATION		DATUM NGVD	
START DATE		10/31/2007		END DATE		11/6/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE		C. Boron					

WATER LEVEL DATA					TYPE OF DRILL RIG	
DATE	TIME	WATER	CASING	NOTES	CASING SIZE AND DIAMETER	OVERBURDEN SAMPLING METHOD
4/5/1996	12:50	Dry	6.2	20 min. stab.	CME-550	2" diameter x 24" long splitspoon
4/8/1996	8:30	3.0	6.2		6-5/8" HSA	5 7/8 Roller Bit-NQ Size Rock Core-3 7/8 Roller bit
4/8/1996	8:30	3.0	6.2			

D E P T H	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V E R L I E S
	BLOWS (6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)				
1						ASPHALT (3 to 4 inches) Subbase (6-inches)		ND	
2									
3	9	S-1	2 - 4	23	25	Red brown Clayey SILT, little Sand, trace Gravel, moist (Native)			
4	11								
5	12								
6	13								
7	8	S-2	4 - 6	34	70	Grades to: ... little Sand, little Gravel.			
8	15								
9	19								
10	19								
11	27	S-3	6 - 8	60	80	Grades to: ... trace Sand, trace Gravel.			
12	29								
13	31								
14	8	S-4	8 - 10	38	90	Splitspoon Refusal at 12.7 ft bgs Auger refusal at 13.2 feet bgs			
15	20								
16	18								
17	24								
18	9	S-5	10 - 12	47	60	Rollerbit to 14.5 feet bgs			
19	20								
20	27								
21	30								
22	10	S-6	12.0 - 12.8		90	BEDROCK Lockport Dolomite Formation Gray, hard, very slight to slight weathering, fine grained, horizontal and low angle fractures.			
23	100/3								
24									
25									
26									
27									
28									
29									
30									

Delphi Automotive  
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 Lockport, NY

DEPTH	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V M (ppm)
	BLOWS (/6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)				
20						BEDROCK Lockport Dolomite Formation Gray, hard, very slight to slight weathering, fine grained, horizontal and low angle fractures.  Rollerbit 29.5 to 30.0 feet.  End of boring at 30 feet bgs.		Sandpack #00N from 18 to 30 feet  2 inch PVC Screen SCH. 40, 10 slot, from 20 to 30 feet.	
21									
22									
23									
24									
25		C-2	24.5 - 29.5	53	53				
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
S - Split Spoon Sample C - Rock Core Sample						NOTES: 1) HNu PI - 101 organic vapor meter (OVM) used to screen soil samples. Meter was calibrated to the equivalent of 100 ppm isobutylene in air. 2) OVM reading from headspace screening of soil samples.			
General Notes:						1) Stratification lines represent approximate boundary between soil types; transitions may be gradual. 2) Water level readings have been made at times and under conditions stated; fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.			

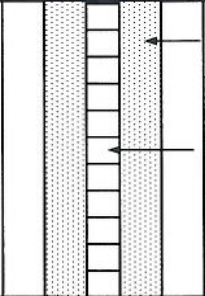
Delphi Automotive  
Additional Well Installation  
Lockport Complex  
Lockport, NY

CONTRACTOR		Earth Dimensions, Inc.		BORING LOCATION		See Location Plan			
DRILLER		Andy Morris		GROUND SURFACE ELEVATION		DATUM NGVD			
START DATE		11/1/2007		END DATE 11/8/2007		GZA GEOENVIRONMENTAL REPRESENTATIVE C. Boron			
WATER LEVEL DATA				TYPE OF DRILL RIG CME-550					
DATE	TIME	WATER	CASING	NOTES	CASING SIZE AND DIAMETER	6-5/8" HSA			
					OVERBURDEN SAMPLING METHOD	2" diameter x 24" long splitspoon			
					ROCK DRILLING METHOD	5 7/8 Roller Bit-NQ Size Rock Core-3 7/8 Roller bit			
DEPTH	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V M (ppm)
	BLOWS (/6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)				
1	4	S-1	0 - 2	13	40	TOPSOIL	<p>Top of Riser Elev. = 592.57 feet Concrete &amp; Stickup Casing Cement/bentonite grout from 0 to 3 feet. 11" Nominal diameter borehole to 5.8 feet. 4" Steel Casing to 7.9 feet. 2-inch PVC flush coupled riser pipe to 10 feet. 2-inch PVC flush coupled riser pipe to 10 feet. Bentonite Pellets from 6 to 9 ft. 2-inch PVC Screen SCH. 40, 10 slot, from 10 to 20 feet. Sand pack from 9 to 20 feet. Nominal 4" diameter rock hole 7.9 to 20 feet.</p>	ND	
	5					Brown Clayey SILT, trace Sand, little Gravel, moist. (FILL)		ND	
2	18					Grades to... mottled, little Sand, little Gravel, moist.		ND	
3	16	S-2	2 - 4	36	25	Red brown SILT, little Sand, little Gravel, moist. (Native)		ND	
4	17					Spillspoon Refusal at 5 feet		ND	
5	52	S-3	4 - 5	152	50	Auger Refusal at 5.8 feet		ND	
6	100/0.5					Rollerbit to 7.9 feet		ND	
7									
8									
9		C-1	7.9 - 10.0	58	90	BEDROCK			
10						Lockport Dolomite Formation			
11						Gray, hard, very slight to slight weathering, fine grained, horizontal and low angle fractures.			
12									
13									
14									
15									
16									
17									
18									
19									
20									
						End of boring at 20 feet bgs.			
S - Split Spoon Sample		NOTES: 1) HNu PI - 101 organic vapor meter (OVM) used to screen soil samples. Meter was calibrated to the equivalent of 100 ppm isobutylene in air.							
C - Rock Core Sample		2) OVM reading from headspace screening of soil samples.							
General		1) Stratification lines represent approximate boundary between soil types; transitions may be gradual.							
Notes:		2) Water level readings have been made at times and under conditions stated; fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.							

Delphi Automotive  
 Additional Well Installation  
 Lockport Complex  
 Lockport, NY

CONTRACTOR		Earth Dimensions, Inc.			BORING LOCATION		See Location Plan							
DRILLER		Andy Morris			GROUND SURFACE ELEVATION		DATUM NGVD							
START DATE		10/31/2007		END DATE		11/8/2007		GZA GEOENVIRONMENTAL REPRESENTATIVE C. Boron						
WATER LEVEL DATA					TYPE OF DRILL RIG									
DATE		TIME		WATER		CASING		NOTES		CME-550				
					CASING SIZE AND DIAMETER					6-5/8" HSA				
					OVERBURDEN SAMPLING METHOD					2" diameter x 24" long splitspoon				
					ROCK DRILLING METHOD					5 7/8 Roller Bit-NQ Size Rock Core-3 7/8 Roller bit				
DEPTH	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V M					
	BLOWS (/6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)					(ppm)				
1						ASPHALT (3 to 4 inches) Subbase (6-inches)		ND						
2						Red brown Clayey SILT, trace Sand, moist. (FILL)		Concrete surface seal to 2.0 ft.	ND					
3	7	S-1	2 - 4	10	50	Dark brown SILT & CLAY, trace Sand, trace Organics, moist. (FILL)		Nominal 10" diameter borehole to 8.2 ft.	ND					
4	5					Dark brown SILT & CLAY, trace Sand, trace Organics, moist. (FILL)		Cement/bentonite grout from 2 to 9.5 feet.	ND					
5	2	S-2	4 - 6	5	20	Dark brown SILT & CLAY, trace Sand, moist. (Native)		4" Steel Casing to 9.5 feet.	ND					
6	3							Bentonite Pellets from 6 to 10.5 ft.	ND					
7	5	S-3	6 - 8	16	50	Red brown Clayey SILT, trace Sand, trace Gravel, moist.		2 inch PVC flush coupled riser pipe to 15 feet.	ND					
8	10					Grades to...wet.		Nominal 4" diameter rock hole 9.5 to 25 feet.	ND					
9	6					Splitspoon & Auger Refusal at 8.2 feet								
10	4					Rollerbit to 9.5 feet								
11	50/0.2	S-4	8 - 8.2		0									
12														
13														
14														
15														
16						BEDROCK								
17						Lockport Dolomite Formation								
18						Gray, hard, very slight to slight weathering, fine grained, horizontal and low angle fractures.								
19														
		C-2	19.5 - 24.5	96	100									



DEPTH H	SAMPLE					SAMPLE DESCRIPTION	WELL INSTALLATION DIAGRAM	WELL INSTALLATION DESCRIPTION	O V M <small>(ppm)</small>	
	BLOWS (/6")	NO.	DEPTH (FT)	N-VALUE /RQD %	RECOVERY (%)					
20										
21										
22										
23										
24										
25						Rollerbit 24.5 to 25.0 feet.	 <p>Sandpack #00N from 10.5 to 25 feet</p> <p>2 inch PVC Screen SCH. 40, 10 slot, from 15 to 25 feet.</p>			
26						End of boring at 25 feet bgs.				
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
S - Split Spoon Sample C - Rock Core Sample			NOTES: 1) HNu PI - 101 organic vapor meter (OVM) used to screen soil samples. Meter was calibrated to the equivalent of 100 ppm isobutylene in air. 2) OVM reading from headspace screening of soil samples.							
General			1) Stratification lines represent approximate boundary between soil types; transitions may be gradual.							
Notes:			2) Water level readings have been made at times and under conditions stated; fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.							

**ATTACHMENT 3**

**HYDRAULIC CONDUCTIVITY CALCULATION SPREADSHEETS**

**Bouwer & Rice Slug Test Method  
Hydraulic Conductivity Calculation Worksheet**

Project 21.0056372.0 Date 1/17/2008  
 Site Delphi Thermal Well No MW-6-1

H =	<u>50.0</u>	feet	(aquifer thickness => assumed)
Le =	<u>10.0</u>	feet	(wetted screen length)
Lw =	<u>12.7</u>	feet	(length from bottom of well to static water table)
rw =	<u>0.500</u>	feet	(borehole radius)
rc =	<u>0.083</u>	feet	(well radius)
n =	<u>0.25</u>		if d = 2 inch, m = 0.163
yo =	<u>4.31</u>	feet	if d = 4 inch, m = 0.653
yt =	<u>2.41</u>	feet	if d = 6 inch, m = 1.469
t =	<u>3.8</u>	min	m = <u>0.163</u> (multiplier)
Le/rw =	<u>20.0</u>		Q = <u>0.082</u> (flowrate)
A =	<u>1.75</u>		Q = <u>1.09E-02</u> (flowrate)
B =	<u>0.25</u>		
C =	<u>1.00</u>		
rc' =	<u>0.260</u>		
In Re =	<u>0.220</u>		
Re =	<u>1.246</u>	feet	
In Re =	<u>1.871</u>		
Re =	<u>6.496</u>	feet	

K =	<u>4.81E-05</u>	ft/min	(hydraulic conductivity)
K =	<u>2.44E-05</u>	cm/sec	(hydraulic conductivity)
T =	<u>4.01E-05</u>	ft <sup>2</sup> /sec	(transmissivity)
T =	<u>25.91</u>	gpd/ft	(transmissivity)

**Bouwer & Rice Slug Test Method  
Hydraulic Conductivity Calculation Worksheet**

Project 21.0056372.0 Date 1/17/2008  
 Site Delphi Thermal Well No MW-6-2

H =	<u>50.0</u>	feet	(aquifer thickness =>assumed)
Le =	<u>10.0</u>	feet	(wetted screen length)
Lw =	<u>18.2</u>	feet	(length from bottom of well to static water table)
rw =	<u>0.500</u>	feet	(borehole radius)
rc =	<u>0.083</u>	feet	(well radius)
n =	<u>0.25</u>		if d = 2 inch, m = 0.163
yo =	<u>15</u>	feet	(porosity of gravel pack)
yt =	<u>10.10</u>	feet	(start water level)
t =	<u>4.73</u>	min	(end water level)
Le/rw =	<u>20.0</u>		(change in time)
A =	<u>2.2</u>		(calculated ratio)
B =	<u>0.65</u>		(from plot)
C =	<u>1.70</u>		(from plot)
rc' =	<u>0.260</u>		(effective radius)
In Re =	<u>0.220</u>		(for Lw<H)
Re =	<u>1.246</u>	feet	(for Lw<H)
In Re =	<u>1.865</u>		(for Lw=H)
Re =	<u>6.453</u>	feet	(for Lw=H)

K =	<u>2.63E-05</u>	ft/min	(hydraulic conductivity)
K =	<u>1.34E-05</u>	cm/sec	(hydraulic conductivity)
T =	<u>2.19E-05</u>	ft <sup>2</sup> /sec	(transmissivity)
T =	<u>14.16</u>	gpd/ft	(transmissivity)

m =	<u>0.163</u>	(multiplier)
Q =	<u>0.169</u>	gpm (flowrate)
Q =	<u>2.26E-02</u>	ft <sup>3</sup> /min (flowrate)

**Bouwer & Rice Slug Test Method  
Hydraulic Conductivity Calculation Worksheet**

Project 21.0056372.0  
Site Delphi Thermal

Date 1/17/2008  
Well No MW-7-2

H =	<u>50.0</u>	feet	(aquifer thickness => assumed)
Le =	<u>10.0</u>	feet	(wetted screen length)
Lw =	<u>12.8</u>	feet	(length from bottom of well to static water table)
rw =	<u>0.500</u>	feet	(borehole radius)
rc =	<u>0.083</u>	feet	(well radius)
n =	<u>0.25</u>		if d = 2 inch, m = 0.163
yo =	<u>11.96</u>	feet	(porosity of gravel pack)
yt =	<u>11.46</u>	feet	(start water level)
t =	<u>15.18</u>	min	(end water level)
Le/rw =	<u>20.0</u>		(change in time)
A =	<u>2.2</u>		(calculated ratio)
B =	<u>0.65</u>		(from plot)
C =	<u>1.70</u>		(from plot)
rc' =	<u>0.260</u>		(effective radius)
In Re =	<u>0.220</u>		(for Lw<H)
Re =	<u>1.246</u>	feet	(for Lw<H)
In Re =	<u>1.664</u>		(for Lw=H)
Re =	<u>5.278</u>	feet	(for Lw=H)

m =	<u>0.163</u>	(multiplier)
Q =	<u>0.005</u>	gpm (flowrate)
Q =	<u>7.18E-04</u>	ft <sup>3</sup> /min (flowrate)

K =	<u>8.85E-07</u>	ft/min (hydraulic conductivity)
K =	<u>4.50E-07</u>	cm/sec (hydraulic conductivity)
T =	<u>7.37E-07</u>	ft <sup>2</sup> /sec (transmissivity)
T =	<u>0.48</u>	gpd/ft (transmissivity)

**Bouwer & Rice Slug Test Method  
Hydraulic Conductivity Calculation Worksheet**

Project	21.0056372.0	Date	1/17/2008
Site	Delphi Thermal	Well No	MW-7-3

H =	50.0	feet	(aquifer thickness =>assumed)
Le =	10.0	feet	(wetted screen length)
Lw =	20.8	feet	(length from bottom of well to static water table)
rw =	0.500	feet	(borehole radius)
rc =	0.083	feet	(well radius)
n =	0.25		if d = 2 inch, m = 0.163
yo =	18.77	feet	if d = 4 inch, m = 0.653
yt =	16.57	feet	if d = 6 inch, m = 1.469
t =	7.36	min	
Le/rw =	20.0		m = 0.163 (multiplier)
A =	1.75		Q = 0.049 gpm (flowrate)
B =	0.25		Q = 6.51E-03 ft <sup>3</sup> /min (flowrate)
C =	1.00		
rc' =	0.260		
In Re =	0.220		
Re =	1.246	feet	
In Re =	2.204		
Re =	9.061	feet	

K =	5.33E-06	ft/min	(hydraulic conductivity)
K =	2.71E-06	cm/sec	(hydraulic conductivity)
T =	4.44E-06	ft <sup>2</sup> /sec	(transmissivity)
T =	2.87	gpd/ft	(transmissivity)

**ATTACHMENT 4**

**FREE COL LABORATORIES ANALYTICAL REPORT**



# FREE-COL LABORATORIES

11618 COTTON ROAD  
MEADVILLE, PENNSYLVANIA 16335

PHONE: (814) 724-6242

FAX: (814) 333-1466

EMAIL: service@freecol.com

Accredited Lab ID#  
Free-Col: 20-00073  
Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013351

2 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine

Contact Name: Mr. Rick Eisenman

Date Received 12/4/2007

Time Received: 09:00

Delivered By: UPS

P.O. Box 92700  
Rochester NY 14692

P.O. 460016825

Project Name: Delphi Thermal System

Printed on 12/10/2007 at 11:27AM

Sample ID: 2007:0013351-1

Client's Sample ID: MW-7-1

Date Sampled: 11/30/2007 Time Sampled: 11:00

Date Received: 12/4/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
<b>Organics</b>						
<b>Volatiles</b>						
Acrolein	<0.010	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Acrylonitrile	<0.010	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Benzene	0.003	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Bromoform	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Carbon Tetrachloride	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Chlorobenzene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Chlorodibromomethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Chloroethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
2-Chloroethylvinyl ether	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Chloroform	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Dichlorobromomethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,1-Dichloroethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,2-Dichloroethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,1-Dichloroethene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,2-Dichloroethenes (Total)	0.008	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,2-Dichloropropane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
cis-1,3-Dichloropropene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
trans-1,3-Dichloropropene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Ethylbenzene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Methyl Bromide	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Methyl Chloride	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Methylene chloride	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,1,2,2-Tetrachloroethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Tetrachloroethylene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Toluene	0.007	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,1,1-Trichloroethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,1,2-Trichloroethane	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Trichloroethylene	0.11	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
Vinyl Chloride	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,2-Dichlorobenzene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B





# FREE-COL LABORATORIES

11618 COTTON ROAD

MEADVILLE, PENNSYLVANIA 16335

PHONE: (814) 724-6242

FAX: (814) 333-1466

EMAIL: service@freecol.com

Accredited Lab ID#

Free-Col: 20-00073

Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013351

2 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine

Contact Name: Mr. Rick Eisenman

Date Received 12/4/2007

Time Received: 09:00

Delivered By: UPS

P.O. Box 92700

Rochester NY 14692

P.O. 460016825

Project Name: Delphi Thermal System

Printed on 12/10/2007 at 11:27AM

Sample ID: 2007:0013351-1

Client's Sample ID: MW-7-1

Date Sampled: 11/30/2007 Time Sampled: 11:00

Date Received: 12/4/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
---------	--------	-------	---------------	------------	---------	---------------

### Organics (Continued)

#### Volatiles (Continued)

1,3-Dichlorobenzene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B
1,4-Dichlorobenzene	<0.002	mg/L	12/06/07	04:00	Perrine	SW-846 8260B

Sample ID: 2007:0013351-2

Client's Sample ID: MW-6-1

Date Sampled: 11/30/2007 Time Sampled: 09:00

Date Received: 12/4/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
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### Organics

#### Volatiles

Acrolein	<0.010	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Acrylonitrile	<0.010	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Benzene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Bromoform	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Carbon Tetrachloride	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Chlorobenzene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Chlorodibromomethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Chloroethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
2-Chloroethylvinyl ether	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Chloroform	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Dichlorobromomethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,1-Dichloroethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,2-Dichloroethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,1-Dichloroethene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,2-Dichloroethenes (Total)	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,2-Dichloropropane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
cis-1,3-Dichloropropene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
trans-1,3-Dichloropropene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B



# FREE-COL LABORATORIES

11618 COTTON ROAD  
MEADVILLE, PENNSYLVANIA 16335  
PHONE: (814) 724-6242  
FAX: (814) 333-1466  
EMAIL: service@freecol.com

Accredited Lab ID#  
Free-Col: 20-00073  
Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013351

2 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine

Contact Name: Mr. Rick Eisenman

Date Received 12/4/2007

Time Received: 09:00

Delivered By: UPS

P.O. Box 92700  
Rochester NY 14692

P.O. 460016825

Project Name: Delphi Thermal System

Printed on 12/10/2007 at 11:27AM

Sample ID: 2007:0013351-2

Client's Sample ID: MW-6-1

Date Sampled: 11/30/2007 Time Sampled: 09:00

Date Received: 12/4/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
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### Organics (Continued)

#### Volatiles (Continued)

Ethylbenzene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Methyl Bromide	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Methyl Chloride	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Methylene chloride	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,1,2,2-Tetrachloroethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Tetrachloroethylene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Toluene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,1,1-Trichloroethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,1,2-Trichloroethane	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Trichloroethylene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
Vinyl Chloride	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,2-Dichlorobenzene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,3-Dichlorobenzene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
1,4-Dichlorobenzene	<0.002	mg/L	12/06/07	09:29	Perrine	SW-846 8260B
CC: GZA						

# CHAIN OF CUSTODY RECORD

Page 1 of 2

**FREE-COL LABORATORIES, Division of Moderna Inc.**

11618 COTTON ROAD 814 724 - 6242  
MEADVILLE, PA 16335 814 333 - 1466 Fax

Website: [www.free-col.com](http://www.free-col.com)

DEF drinking water compliance provide the following:

DRINKING WATER:

PWSID #:

Location:

Entry Point #:

Sampling Frequency (Circle One):

Quarterly/Monthly/Annual

Check Sample: Yes / No

3 PROJECT NAME / NUMBER

DELPHE THERMAL SYSTEMS

4 SAMPLER'S NAME / DATE

JONN BENEVANTE

SAMPLE RANGE:

ANALYSIS REQUESTED/COMMENTS (If composite, please use inclusive dates and times.)

CHL, Fe, Hg, Pb, S, Na, Alk, TDC, Cl, NH<sub>3</sub>, NO<sub>3</sub>, NO<sub>2</sub>, Sulfate, Sulfide, + Vol's (P.E.)  
TCE, Cis-1,2-Dichloroethylene, Trans-1,2-Dichloroethylene, V. Chloroac.

TU vol's

TU vol's

13351-1

2

## 1 CLIENT INFORMATION

COMPANY DELPHE THERMAL / GZA  
CONTACT CHRIS BURTON (GZA)  
ADDRESS 535 WASHINGTON ST 11th Floor  
CITY Buffalo  
STATE NY ZIP CODE 14207  
PHONE 716-685-2800 FAX 716-685-0629

PURCHASE ORDER NUMBER

CLIENT #

## 5 SAMPLE INFORMATION

GRAB

FOR FREE-COL USE ONLY COMP

FREE-COL ID RESULTS

SAMPLE IDENTIFICATION

DATE TIME

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

## 6 SAMPLE TRACEABILITY

Signature

ORGANIZATION

DATE RELINQUISHED

USE BY LABORATORY ONLY

Refrigerated upon receipt?

YES NO

YES NO

Samples received at lab

Means of delivery to lab

Sample cooler temp. upon receipt

Sample check in started

Analyst

Reviewed by

Worksheet Number

12/05/07

12/14

12/11/07

Date 12/14/07

Date 12/14/07

Date 12/14/07

Date 12/14/07

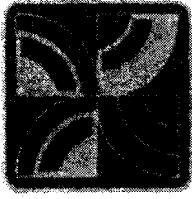
Date 12/14/07

Date 12/14/07

Date 12/14/07

Date 12/14/07

Date 12/14/07



# FREE-COL LABORATORIES

11618 COTTON ROAD  
MEADVILLE, PENNSYLVANIA 16335  
PHONE: (814) 724-6242  
FAX: (814) 333-1466  
EMAIL: service@freecol.com

Accredited Lab ID#  
Free-Col: 20-00073  
Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013303

6 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine  
Contact Name: Mr. Rick Eisenman

Date Received 12/1/2007  
Time Received: 09:00  
Delivered By: UPS

P.O. Box 92700  
Rochester NY 14692

P.O. 460016825

Project Name: Delphi Thermal Systems

Printed on 12/26/2007 at 11:02AM

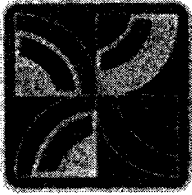
Sample ID: 2007:0013303-3

Client's Sample ID: MW-7-2

Date Sampled: 11/29/2007 Time Sampled: 08:40

Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
<u>Organics</u>						
<b>Volatiles</b>						
Acrolein	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Acrylonitrile	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Benzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Bromoform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Carbon Tetrachloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chlorodibromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
2-Chloroethylvinyl ether	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Dichlorobromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethenes (Total)	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloropropane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
cis-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
trans-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Ethylbenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Bromide	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methylene chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2,2-Tetrachloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Tetrachloroethylene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Toluene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,1-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Trichloroethylene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Vinyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B



# FREE-COL LABORATORIES

11618 COTTON ROAD  
MEADVILLE, PENNSYLVANIA 16335  
PHONE: (814) 724-6242  
FAX: (814) 333-1466  
EMAIL: service@freecol.com

Accredited Lab ID#  
Free-Col: 20-00073  
Modern Eric: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013303

6 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine  
Contact Name: Mr. Rick Eisenman

Date Received 12/1/2007  
Time Received: 09:00  
Delivered By: UPS

P.O. Box 92700  
Rochester NY 14692

P.O. 460016825

Project Name: Delphi Thermal Systems

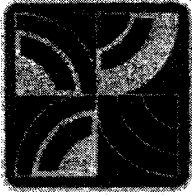
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Sample ID: 2007:0013303-3 Client's Sample ID: MW-7-2  
Date Sampled: 11/29/2007 Time Sampled: 08:40 Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
<b>Organics (Continued)</b>						
<b>Volatiles (Continued)</b>						
1,3-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,4-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B

Sample ID: 2007:0013303-4 Client's Sample ID: MW-7-3  
Date Sampled: 11/29/2007 Time Sampled: 10:30 Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
<b>Organics</b>						
<b>Volatiles</b>						
Acrolein	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Acrylonitrile	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Benzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Bromoform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Carbon Tetrachloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chlorodibromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
2-Chloroethylvinyl ether	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Dichlorobromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethenes (Total)	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloropropane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
cis-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
trans-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B



# FREE-COL LABORATORIES

11618 COTTON ROAD  
MEADVILLE, PENNSYLVANIA 16335  
PHONE: (814) 724-6242  
FAX: (814) 333-1466  
EMAIL: service@freecol.com

Accredited Lab ID#  
Free-Col: 20-00073  
Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013303

6 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine  
Contact Name: Mr. Rick Eisenman  
P.O. Box 92700  
Rochester NY 14692

Date Received 12/1/2007  
Time Received: 09:00  
Delivered By: UPS  
P.O. 460016825

Project Name: Delphi Thermal Systems

Printed on 12/26/2007 at 11:02AM

Sample ID: 2007:0013303-4 Client's Sample ID: MW-7-3  
Date Sampled: 11/29/2007 Time Sampled: 10:30 Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
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### Organics (Continued)

#### **Volatiles (Continued)**

Ethylbenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Bromide	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methylene chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2,2-Tetrachloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Tetrachloroethylene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Toluene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,1-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Trichloroethylene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Vinyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,3-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,4-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B

Surrogate recoveries for this sample were outside of the established limits due to matrix interferences.

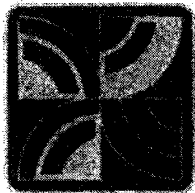
Sample ID: 2007:0013303-5 Client's Sample ID: MW-6-2  
Date Sampled: 11/29/2007 Time Sampled: 16:25 Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
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### Organics

#### **Volatiles**

Acrolein	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Acrylonitrile	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Benzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Bromoform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Carbon Tetrachloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B



# FREE-COL LABORATORIES

11618 COTTON ROAD

MEADVILLE, PENNSYLVANIA 16335

PHONE: (814) 724-6242

FAX: (814) 333-1466

EMAIL: service@freecol.com

Accredited Lab ID#

Free-Col: 20-00073

Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013303

6 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine

Contact Name: Mr. Rick Eisenman

P.O. Box 92700

Rochester NY 14692

Date Received 12/1/2007

Time Received: 09:00

Delivered By: UPS

P.O. 460016825

Project Name: Delphi Thermal Systems

Printed on 12/26/2007 at 11:02AM

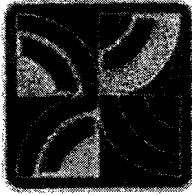
Sample ID: 2007:0013303-5

Client's Sample ID: MW-6-2

Date Sampled: 11/29/2007 Time Sampled: 16:25

Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
<b>Organics (Continued)</b>						
<b>Volatiles (Continued)</b>						
Chlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chlorodibromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
2-Chloroethylvinyl ether	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Dichlorobromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethenes (Total)	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloropropane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
cis-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
trans-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Ethylbenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Bromide	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methylene chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2,2-Tetrachloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Tetrachloroethylene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Toluene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,1-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Trichloroethylene	0.025	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Vinyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,3-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,4-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B



# FREE-COL LABORATORIES

11618 COTTON ROAD  
MEADVILLE, PENNSYLVANIA 16335  
PHONE: (814) 724-6242  
FAX: (814) 333-1466  
EMAIL: service@freecol.com

Accredited Lab ID#  
Free-Col: 20-00073  
Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013303

6 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine  
Contact Name: Mr. Rick Eisenman

Date Received: 12/1/2007

Time Received: 09:00

Delivered By: UPS

P.O. Box 92700  
Rochester NY 14692

P.O. 460016825

Project Name: Delphi Thermal Systems

Printed on 12/26/2007 at 11:02AM

Sample ID: 2007:0013303-6 Client's Sample ID: Trip Blank  
Date Sampled: 11/20/2007 Time Sampled: 08:40 Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
<b>Organics</b>						
<b>Volatiles</b>						
Acrolein	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Acrylonitrile	<0.010	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Benzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Bromoform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Carbon Tetrachloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chlorodibromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
2-Chloroethylvinyl ether	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Chloroform	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Dichlorobromomethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1-Dichloroethene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloroethenes (Total)	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichloropropane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
cis-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
trans-1,3-Dichloropropene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Ethylbenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Bromide	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Methylene chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2,2-Tetrachloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Tetrachloroethylene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Toluene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,1-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,1,2-Trichloroethane	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Trichloroethylene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
Vinyl Chloride	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,2-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B





# FREE-COL LABORATORIES

11618 COTTON ROAD  
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EMAIL: service@freecol.com

Accredited Lab ID#  
Free-Col: 20-00073  
Modern Erie: 25-03459

## Certificate Of Analysis

Delivery Group ID: 2007:0013303

6 Sample(s) are included in this Delivery Group.

Company Name: Delphi Energy & Engine  
Contact Name: Mr. Rick Eisenman

Date Received 12/1/2007

Time Received: 09:00

Delivered By: UPS

P.O. Box 92700  
Rochester NY 14692

P.O. 460016825

Project Name: Delphi Thermal Systems

Printed on 12/26/2007 at 11:02AM

Sample ID: 2007:0013303-6 Client's Sample ID: Trip Blank  
Date Sampled: 11/20/2007 Time Sampled: 08:40 Date Received: 12/1/2007

Analyte	Result	Units	Date Analyzed	Start Time	Analyst	Method Source
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### Organics (Continued)

#### **Volatiles (Continued)**

1,3-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B
1,4-Dichlorobenzene	<0.002	mg/L	12/04/07	14:57	Perrine	SW-846 8260B

CC: GZA

