

Glenn Springs Holdings, Inc.

A subsidiary of Occidental Petroleum

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November 24, 2009

Reference No. 001431

Mr. Gregory P. Sutton New York State Department of Environmental Conservation 270 Michigan Avenue Region 9 Buffalo, NY 14203-2999

Dear Mr. Sutton:

Re:

Analytical Results and QA/QC Review

Semiannual Groundwater Sampling - October 2009 102nd Street Landfill Site, Niagara Falls, New York

On behalf of Glenn Springs Holdings, Inc (GSH) and per the requirements of the Consent Decree and the Operations and Maintenance (O&M) Manual, Conestoga-Rovers & Associates (CRA) has prepared and is submitting the Analytical Results and Quality Assurance/Quality Control (QA/QC) Review for the Semiannual Groundwater Sampling performed at the 102nd Street Landfill Site (Site) in October 2009. An electronic copy is provided on the enclosed CD.

The quarterly groundwater quality monitoring that was required for the first 2 years of operation in accordance with the approved O&M Manual was completed in April 2004. As per the O&M Manual, monitoring is to be performed semiannually for the following 8 years after completion of the quarterly monitoring. Therefore, semiannual groundwater quality monitoring will continue through 2012.

A figure showing the orientation of the Site and the locations of the monitoring wells is included in this submittal as Figure 1.

Please contact me at 972-687-7506 should you have any questions or concerns.

Very truly yours,

Michael J. Bellotti, P.G.

Environmental Remediation Group

111. Kail & Billoth

Olin Corporation

423-336-4587

Clint Babcock Project Manager

Glenn Springs Holdings, Inc.

972-687-7506

Ralph Schupp

Operations Coordinator

Glenn Springs Holdings, Inc.

484-941-3000

CB/JP/adh/5 Encl.

C.C.:

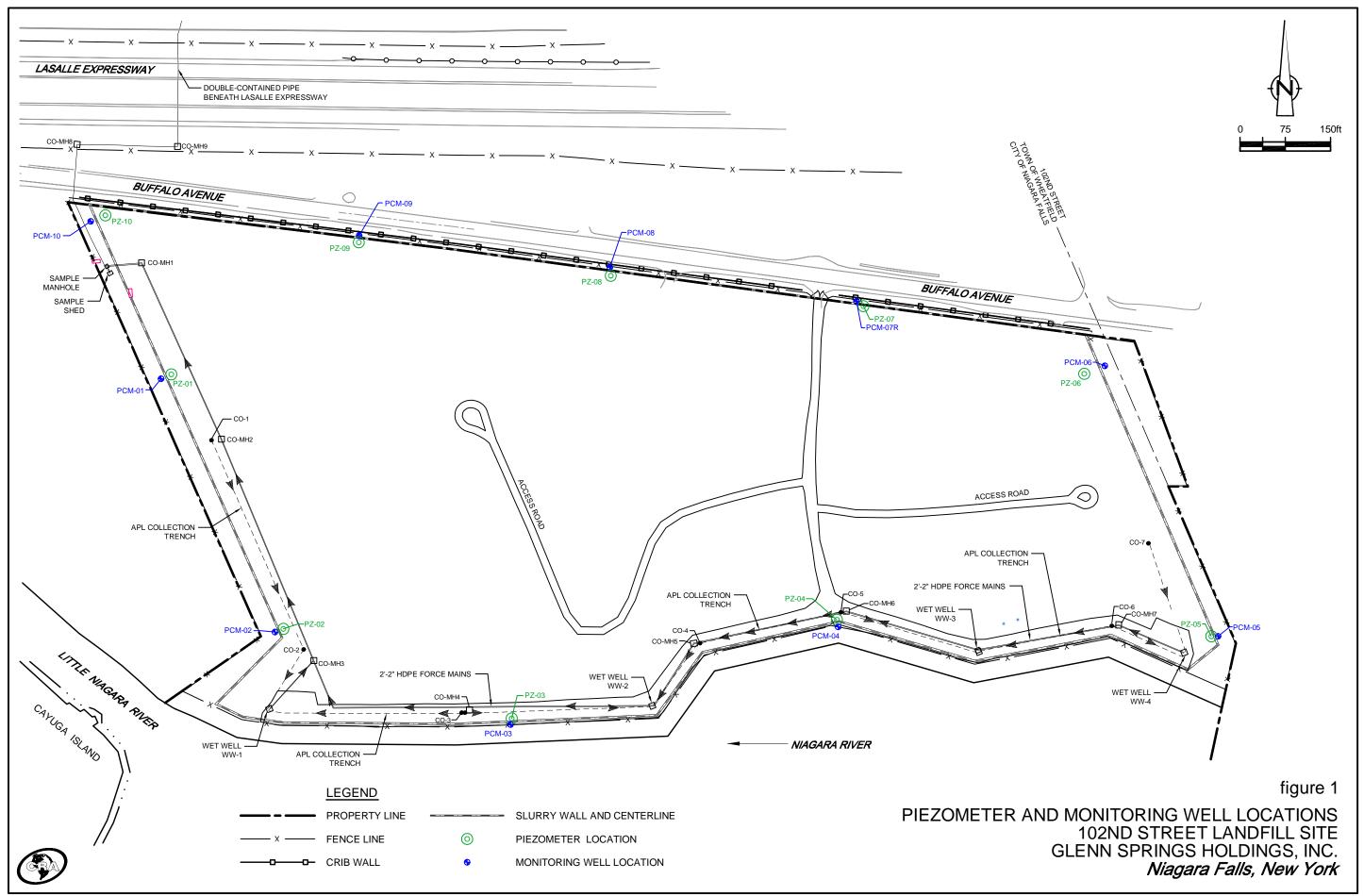
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E-Mail Date:

November 24, 2009

E-Mail To:

Mike Bellotti; Clint Babcock;

Dennis Hoyt; Jane Polovich; Ralph

Schupp

c.c.:

Paul McMahon

E-Mail and Hard Copy If Requested

ANALYTICAL RESULTS AND QA/QC REVIEW SEMI-ANNUAL GROUNDWATER SAMPLING 102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

PREPARED BY:

CONESTOGA-ROVERS & ASSOCIATES

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Contact:

Paul McMahon [bjw]

Date: November 24, 2009

www.CRAworld.com

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1.0 INTRODUCTION

Groundwater samples were collected in support of the Operation and Maintenance Program at the 102nd Street Landfill (Site) in Niagara Falls, New York. The samples were collected in October 2009 and delivered to Mitkem Laboratories in Warwick, Rhode Island for analysis. Samples were analyzed for Site-Specific Parameter List (SSPL) volatile organic compounds (VOCs), SSPL semi-volatile organic compounds (SVOCs), SSPL pesticides, total mercury, and total arsenic. A sampling and analysis summary is presented in Table 1. The analytical results are summarized in Table 2 and the analytical methods used are summarized in Table 3. Copies of the Chain of Custody documents are included in Attachment A.

The final sample results and supporting quality assurance/quality control (QA/QC) results were reported by the laboratory in accordance with the requested deliverables. The QA/QC criteria by which these data were assessed are outlined in the analytical methods used and the following guidance documents:

- i) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", October 1999
- ii) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", February 1994

All data were reviewed for the QA/QC information detailed in Section 2.0 by Paul McMahon of CRA, Inc.

A graphical presentation of the concentration of chemical constituents versus time for wells PCM-03, PCM-04, and PCM-05 is located in Attachment B.

2.0 QA/QC REVIEW

Holding Times

The sample holding time criteria are specified in Table 3. All holding time criteria were met. All samples were properly preserved and received chilled.

Surrogate Spike Recoveries -VOCs/SVOCs/Pesticides

All samples and blanks analyzed for VOCs, SVOCs, and pesticides were spiked with surrogate compounds prior to sample extraction and/or analysis. Per the "Guidelines",

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it is acceptable for one SVOC surrogate recovery per fraction to be outside of the limits provided the recovery is greater than 10 percent.

Most surrogate spike recoveries were acceptable per the "Guidelines", indicating good analytical efficiency. High VOC surrogate recoveries were reported for the neat analysis of one sample. All associated detected sample results were qualified as estimated (see Table 4).

Laboratory Method Blank Analyses

Method blanks were extracted and/or analyzed with the investigative samples for all parameters. Most methods blanks were non-detect for the analytes of interest. Arsenic was detected in one method blank, and the associated sample result was qualified as non-detect (see Table 5).

Matrix Spike/Matrix Spike Duplicate/Duplicate (MS/MSD/Duplicate) Analyses

One sample was selected for MS/MSD analyses as specified in Table 1. The metals analyses were also performed in duplicate. Most recoveries and all relative percent differences (RPDs) were acceptable, demonstrating good analytical accuracy and precision. High MS/MSD recoveries were reported for one VOC. The associated sample result was non-detect and was not impacted by the indicated high bias.

Laboratory Control Sample (LCS) Analyses

LCSs were analyzed for all parameters. Some analyses were performed in duplicate. Most recoveries and RPDs were acceptable, indicating good analytical accuracy and precision. High LCS recoveries were reported for one VOC. The associated sample results were non-detect and were not impacted by the indicated high bias. One high RPD was reported for the SVOC LCS analyses, and the associated detected sample result was qualified as estimated (see Table 6).

Field Duplicate Analysis

One field duplicate sample was submitted "blind" to the laboratory for analyses as summarized in Table 1.

All field duplicate results showed acceptable reproducibility outside of estimated regions of detection, indicating good laboratory and sampling protocol precision.

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Trip Blanks

Two trip blanks were collected for the program. The trip blanks were analyzed for VOCs, and all results were non-detect.

3.0 <u>CONCLUSION</u>

Based on this QA/QC review, the data presented in Table 2 are acceptable with the noted qualifications.

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SAMPLE COLLECTION AND ANALYSIS SUMMARY SEMI-ANNUAL GROUNDWATER SAMPLING 102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

Analysis/Parameters

Sample ID	Location I.D. ⁽¹⁾	Collection Date	Collection Time	BHCs	VOCs	Metals	SVOCs	Depth to Water ⁽²⁾ (ft. BTOC)	Comment
TB-102ND102109	-	10/21/09	-		Χ			~	Trip Blank
PCBM-011009	PCBM-01	10/21/09	13:00	Χ	Χ	Χ	Χ	12.56	MS/MSD/Duplicate
PCBM-021009	PCBM-02	10/21/09	13:30	Χ	Χ	Χ	Χ	11.89	
PCM-121009	PCBM-02	10/21/09	15:00	Χ	Χ	Χ	Χ	11.89	Duplicate of PCBM-021009
PCBM-031009	PCBM-03	10/21/09	9:45	Χ	Χ	Χ	Χ	15.91	1
PCM-011009	PCM-01	10/21/09	11:15	Χ	Χ	Χ	X	13.26	
PCM-021009	PCM-02	10/23/09	10:15	X	Χ	Χ	Χ	11.85	
PCM-031009	PCM-03	10/23/09	10:30	Χ	Χ	Χ	Χ	12.91	
PCM-041009	PCM-04	10/23/09	11:30	Χ	Χ	Χ	X	11.69	
PCM-051009	PCM-05	10/23/09	11:45	X	Χ	Χ	Χ	12.29	
PCM-071009	PCM-07R	10/23/09	9:00	Χ	Χ	X	X	12.59	
PCM-081009	PCM-08	10/21/09	10:15	X	Χ	Χ	Χ	10.69	
PCM-101009	PCM-10	10/21/09	11:00	Χ	Χ	Χ	X	13.60	
TB-102ND102309	-	10/23/09	-		Χ			-	Trip Blank

Notes:

(1)	Wells PCM-06 and PCM-09 were dry.

Niagara River water level for September 15, 2009 was 563.71 feet.

- Not applicable.

 $BHCs \qquad Benzene \ Hexachlorides.$

ft. BTOC Feet Below Top of Casing.

MS Matrix Spike.

MSD Matrix Spike Duplicate.

SVOCs Semi-Volatile Organic Compounds.

VOCs Volatile Organic Compounds.

ANALYTICAL RESULTS SUMMARY SEMI ANNUAL GROUNDWATER SAMPLING 102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

	Sample Location: Sample ID: Sample Date:	PCBM-01 PCBM-011009 10/21/2009	PCBM-02 PCBM-021009 10/21/2009	PCBM-02 PCM-121009 10/21/2009 (Duplicate)	PCBM-03 PCBM-031009 10/21/2009	PCM-01 PCM-011009 10/21/2009	PCM-02 PCM-021009 10/23/2009	PCM-03 PCM-031009 10/23/2009
Parameters	Units			•				
Volatile Organic Compound	s							
1,2,3-Trichlorobenzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	90
1,4-Dichlorobenzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	500
2-Chlorotoluene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	73
Chlorobenzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4900
Semi-volatile Organic Comp	ounds							
1,2,4,5-Tetrachlorobenzene	μg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	μg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	μg/L	10 U	10 U	10 U	10 U	10 U	10 U	11 J
2,5-Dichlorophenol	μg/L	10 U	10 U	10 U	10 U	10 U	10 U	3.9 J
2-Chlorophenol	μg/L	10 U	10 U	10 U	10 U	10 U	10 U	16
4-Chlorophenol	μg/L	10 U	10 U	10 U	10 U	10 U	10 U	71
Phenol	μg/L	10 U	10 U	10 U	10 U	10 U	10 U	1.3 J
Pesticides								
alpha-BHC	μg/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	μg/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.12
delta-BHC	μg/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	1.5
gamma-BHC (Lindane)	μg/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Metals								
Arsenic	μg/L	10 U	3.3 J	2.0 J	3.4 J	3.8 J	10 U	10 U
Mercury	μg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

CRA 001431-DV-23-Tbls

J - Estimated.

U - Not detected.

TABLE 2

ANALYTICAL RESULTS SUMMARY SEMI ANNUAL GROUNDWATER SAMPLING 102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

	Sample Location: Sample ID: Sample Date:	PCM-04 PCM-041009 10/23/2009	PCM-05 PCM-051009 10/23/2009	PCM-07R PCM-071009 10/23/2009	PCM-08 PCM-081009 10/21/2009	PCM-10 PCM-101009 10/21/2009
Parameters	Units					
Volatile Organic Compound	ds					
1,2,3-Trichlorobenzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	μg/L	18 J	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	μg/L	300	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorotoluene	μg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzene	μg/L	25 J	4.5	1.0 U	1.0 U	1.0 U
Chlorobenzene	μg/L	10000	150	1.0 U	1.0 U	1.0 U
Semi-volatile Organic Com	pounds					
1,2,4,5-Tetrachlorobenzene	$\mu g/L$	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	μg/L	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	μg/L	10 U	10 U	10 U	10 U	10 U
2,5-Dichlorophenol	μg/L	1.4 J	10 U	10 U	10 U	10 U
2-Chlorophenol	μg/L	24	10 U	10 U	10 U	10 U
4-Chlorophenol	μg/L	49	10 U	10 U	10 U	10 U
Phenol	μg/L	7.2 J	10 U	10 U	10 U	10 U
Pesticides						
alpha-BHC	μg/L	0.050 U	0.050 U	0.060	0.050 U	0.040 J
beta-BHC	μg/L	0.050 U	0.050 U	0.050 U	0.050 U	0.13
delta-BHC	μg/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	μg/L	0.050 U	0.050 U	0.028 J	0.050 U	0.050 U
Metals						
Arsenic	μg/L	10 U	10 U	1.8 J	10 U	2.9 J
Mercury	μg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

J - Estimated.

U - Not detected.

ANALYTICAL METHOD SUMMARY SEMI-ANNUAL GROUNDWATER SAMPLING 102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

Analyses	Methodology ⁽¹⁾	Holding Time to Extraction (Days)	Holding Time to Analyses (Days)
VOCs	SW-846 8260B	-	14
SVOCs	SW-846 8270C	7	40
Pesticides	SW-846 8081A	7	40
Arsenic Mercury	SW-846 6010B SW-846 7470A	- -	180 28

Notes:

(1) Referenced from "Test Methods for Evaluating Solid Waste", USEPA OSW, 3rd Edition, 1986 and subsequent revisions.

 ${\bf SVOCs} \quad {\bf Semi-Volatile\ Organic\ Compounds}.$

VOCs Volatile Organic Compounds.

QUALIFIED SAMPLE RESULTS DUE TO OUTLYING SURROGATE RECOVERIES SEMI-ANNUAL GROUNDWATER SAMPLING 102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

Parameter	Surrogate	Surrogate Recovery (percent)	Control Limits (percent)	Sample ID	Analytes	Sample Results	Units	Qualifier
VOCs	Toluene-d8 Bromofluorobenzene	146 144	85-120 75-120	PCM-041009	Benzene 1,2-Dichlorobenzene	25 18	μg/L μg/L	J

Notes:

Estimated.

VOCs Volatile Organic Compounds.

QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE METHOD BLANKS SEMI-ANNUAL GROUNDWATER SAMPLING 102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

Parameter	Analysis Date	Analyte	Blank Result	Sample ID	Sample Result (ug/L)	Qualified Result (ug/L)
Metals	11/02/09	Arsenic	2.6 J	PCM-041009	2.6 J	10 U

Notes:

J Estimated.

U Not detected.

QUALIFIED SAMPLE RESULTS DUE TO OUTLYING LABORATORY CONTROL SAMPLE (LCS)/ LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) RECOVERIES SEMI-ANNUAL GROUNDWATER SAMPLING

102ND STREET LANDFILL NIAGARA FALLS, NEW YORK OCTOBER 2009

			LCS	LCSD		Control	<u>Limits</u>			
Parameter	Sample ID	Analyte	Recovery (percent)	Recovery (percent)	RPD (percent)	Recovery (percent)	RPD (percent)	Sample Result	Units	Qualifier
SVOCs	PCM-031009	2,4-Dichlorophenol	80	52	42	50-105	40	11	μg/L	J

Notes:

J Estimated.

LCS Laboratory Control Sample.

LCSD Laboratory Control Sample Duplicate.

RPD Relative Percent Difference.

SVOCs Semi-volatile Organic Compounds.

ATTACHMENT A CHAIN OF CUSTODY DOCUMENTS

Due Date: 11/9/19

CHAIN-OF-CUSTODY/Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Client In	formation
Glenn Springs Holdings, Inc.	Report To: Paul McMahon
Love Canal	Copy To: pmcmahon@craworld.com
805 97th Street	
Niagara Falls, NY 14304	Invoice To:
Phone: 716-283-0111	PO:
Fax: 716-283-2856	Project Name: 102nd Street
Email: darrell_crockett@oxy.com	Project Number: 1431

Laboratory: MITKEM CO	RPORATION	
Laboratory Location: 17: Warwick,RI 02886	5 Metro Center Blvd.	
Laboratory Contact:		
Requested Due Date:	TAT: 10	
QA/QC Requirements:		

Event Information
ID#: 102nd St-OCTOBER2009-01-1
SSOW Ref#: 274-402-999-3100

Sampler Name: 6

		Valid Matrix Code WG Groundwater WB Borehole Water								Sample Condition				
Hö	12098	WS Surface Water SO Soil SE Sediment		D	Time Collected	As/MeC-(HNO3)	BHC-(none)	SVOCs-(none)	VOCs-(HCI)		Temp in C			
			ode	Date Collected							Received on ice	Y/N		
			Matrix Co								Sealed Cooler	Y/N		
											Samples Intact	Y/N		
1.	Sample Identification									Remarks				
Ì	PCBM-011009			10/21/2009	13:00	1	2	2	3	MS/MSD				
2	PCBM-021009			10/21/2009	13:30	1	2	2	3					
3	PCBM-031009		WG	10/21/2009	09:45	1	2	2	3					
Ų	PCM-011009		WG	10/21/2009	11:15	1	2	2	3					
5	PCM-081009		WG	10/21/2009	10:15	1	2	2	3					
Ġ	PCM-101009			10/21/2009	11:00	1	2	2	3			,		
7	PCM-121009			10/21/2009	15:00	1	2	2	3					
8	TB-102ND-102109		WG Q	10/21/2009	00:00	0	0	0	2					
8	Total Bottles	otal Bottles					14	14	23	Grand Tota	1:58			

SHIPMENT METHOD	NO. OF COOLERS	RELINQUISHED BY:	DATE	TIME	RECIEVED BY:	DATE	TIME
UPS	4	Shawraldow	10/21/09	1645	Hust Joth	10/22/09	9:30
AIRBILL#:							

20,00,10,20,



EVENT COMPLETE

Du Date: 11/9/09

CHAIN-OF-CUSTODY/Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

ŀ	Glenn Springs Holdings, Inc. Report To: Paul McMahon Love Canal Copy To: pmcmahon@craworld.com					Lab Information Laboratory: MITKEM CORPORATION					ID#: 102ndOCTOBER2009-02-1				
F	805 97th Street					oratory Le	ocation:	175 Metro	Center E	lvd.	SSOW Boff, 274 402 000 2400				
Niagara Falls, NY 14304 Invoice To:						wick,RI 0:		.,			350W Rei#: 274	SSOW Ref#: 274-402-999-3100			
Phone: 716-283-0111 PO:					Labo	Laboratory Contact:					Samular Name of	Samular Nama C			
Fax: 716-283-2856					Requ	Requested Due Date: TAT: 10					Sampler Name: Share	Marahren,			
1	Email: darrell crockett@oxy.com Project Number: 1431					QA/QC Requirements:									
												Administration and an administration of the second of the			
		Valid Matrix Code WG Groundwater WB Borehole Water WS Surface Water		Ę.	p	13)			VOCs-(HCI)		Sample Condition Temp in C				
λ		SO Soil SE Sediment	Matrix Code	Date Collected	Time Collected	As/MeC-(HNO3)	BHC-(none)	SVOCs-(none)			Received on ice Y/N Sealed Cooler Y/N Samples Intact Y/N				
	Sample Identification		Mat	Dat	ļ į.	As/	H	SVC	- Š	Remarks					
	PCM-021009		WG	10/23/2009	10:15	1	2	2	3						
	PCM-031009			10/23/2009	10:30	1	2	2	3						
	PCM-041009			10/23/2009	11:30	1	2	2	3						
PCM-051009		WG	10/23/2009	11:45	1	.2	2	3							
PCM-071009		WG	10/23/2009	09:00	1	1	1	3							
	TB-102ND102309		WG Q	10/23/2009	00:00	0	0	0	2						
	Total Bottles					5	9	9	17	Grand To	tal:40				
SHIPMENT METHOD NO. OF COOLERS RELINQUISHED BY:								DATE	TIME	REC	IEVED BY:	DATE TIME			
UPS 2 Shalm Hardren					$\overline{}$			10/23/0	9 131	5 10	mill Hutter	10/24/09 9:0			
-	AIRBILL#:								C	1 1	7,000,000	1.10 1.0 (,)			

20,30

ATTACHMENT B

GRAPHICAL PRESENTATION CHEMICAL CONCENTRATION VERSUS TIME

