



STEPHEN D. FLEMING, PE, CHMM  
SENIOR REMEDIATION MANAGER

December 1, 2016

**Transmitted:** PDF File via E-Mail and USPS 1<sup>st</sup> Class Mail

**Mr. Kent Johnson**  
**Senior Engineering Geologist**  
**New York State Dept. of Environmental Conservation**  
**Division of Environmental Remediation**  
**Remedial Section B, Remedial Bureau E**  
**625 Broadway**  
**Albany, NY 12233-7017**

**SUBJECT: Groundwater Monitoring Report for 2016**  
**Former Safety-Kleen Service Center**  
**27 St. Charles Street, Thornwood, New York**

Dear Mr. Johnson:

This letter serves as the Safety-Kleen Systems, Inc., (Safety-Kleen) 2016 groundwater monitoring report for the former Safety-Kleen Service Center addressed 27 St. Charles Street in Thornwood, New York (the "Site", refer to **Attachment 1**). Report sections include summaries of Site status, field and laboratory activities, results, conclusions and recommendations for the Site.

### **CLOSURE COMPLIANCE STATUS**

The Site is in the Compliance Monitoring phase of the Post Closure Monitoring program. A New York State multi-site Consent Order has been proposed by the New York State Department of Environmental Conservation (NYSDEC), and a draft of document is to be provided by the Department.

### **WELL REDEVELOPMENT WORK PLAN**

On October 2, 2015, a work plan was submitted to the NYSDEC to redevelop Site well GT-2R. The work plan was approved on November 20, 2015 and the well was redeveloped by vacuum truck on March 14, 2016 in advance of groundwater sampling (**Section 3.1**). Groundwater generated during the redevelopment process was removed from the premises by the vacuum truck and disposed in accordance with applicable regulations by Clean Harbors Environmental Services, Inc. (CHES). ORC socks deployed in the well were removed prior to well redevelopment, and redeployed following well redevelopment. A map depicting well locations is included in **Attachment 1** and a summary of the well redevelopment activities is included in **Attachment 2**.

## SCOPE OF WORK

In accordance with the Groundwater Monitoring Report for 2015 dated December 1, 2015, monitoring in 2016 was postponed one month, from February to March, to alleviate winter-weather related access issues for Site wells in February. The following scope of work was performed at the Site in 2016:

1. Redevelop well GT-2R on March 14, 2016:
2. Groundwater gauging, collection of field parameters, and sampling of Site wells on March 23, 2016, and
3. Maintenance of the Oxygen Release Compound – Advanced (ORC-A®) slow release filter socks, available from Regenesis in San Clemente, California, in well GT-2R.

## GROUNDWATER GAUGING AND FIELD PARAMETER COLLECTION

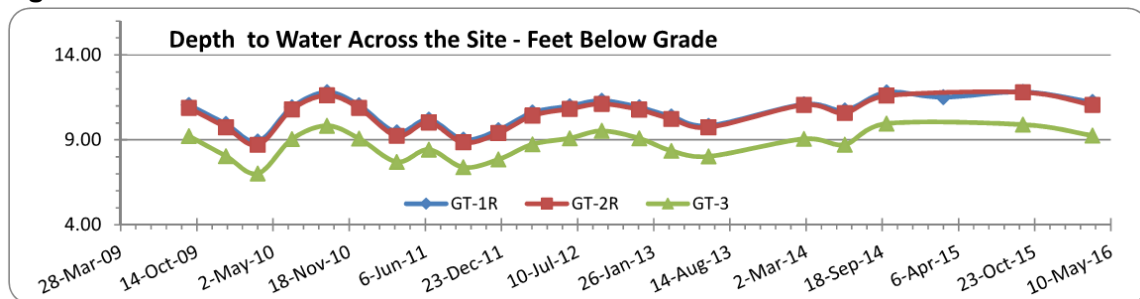
Wells GT-1R, GT-2R, GT-3, GT-4 and GT-5 are monitored twice per year, and were scheduled for monitoring in March and December<sup>1</sup> 2016. CHES performed on-site field services on March 23, 2016. All monitoring wells were gauged and sampled as scheduled.

ORC-A® filter socks, deployed in well GT-2R, were removed prior to monitoring, and replaced, with new socks deployed in the well during the March event.

Groundwater Sampling Records, including depth-to-groundwater, temperature, pH, conductivity, dissolved oxygen (DO), redox potential (ORP), and visual turbidity recorded for each location, are provided as **Attachment 2**. Current and historic Site field parameter measurements are presented in **Attachment 3, Table 1**.

Depth-to-groundwater was within typical historic ranges, and fluctuations over time were generally consistent from well to well. The changes in the depth to water across the Site (wells GT-1R, GT-2R and GT-3) are presented below in **Figure 1**.

**Figure 1**

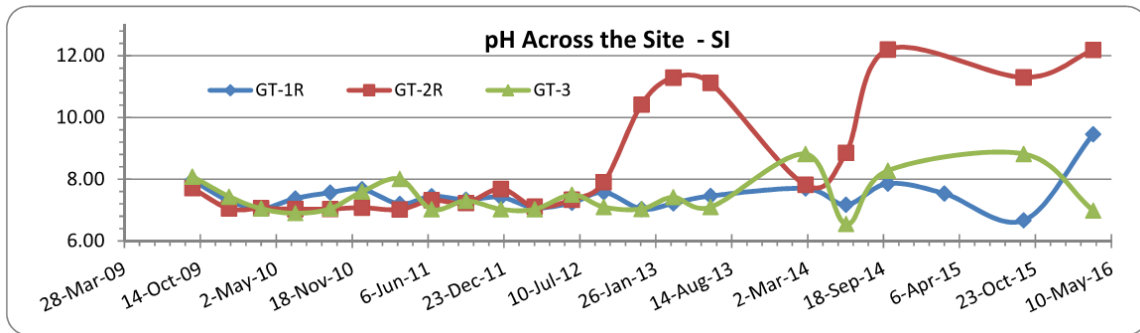


<sup>1</sup> To be reported in the Groundwater Monitoring Report for 2017.

Water table elevations were used to develop a contour map (**Attachment 1**). Flow was generally west – northwest and the water table gradient was approximately 1.4 %.

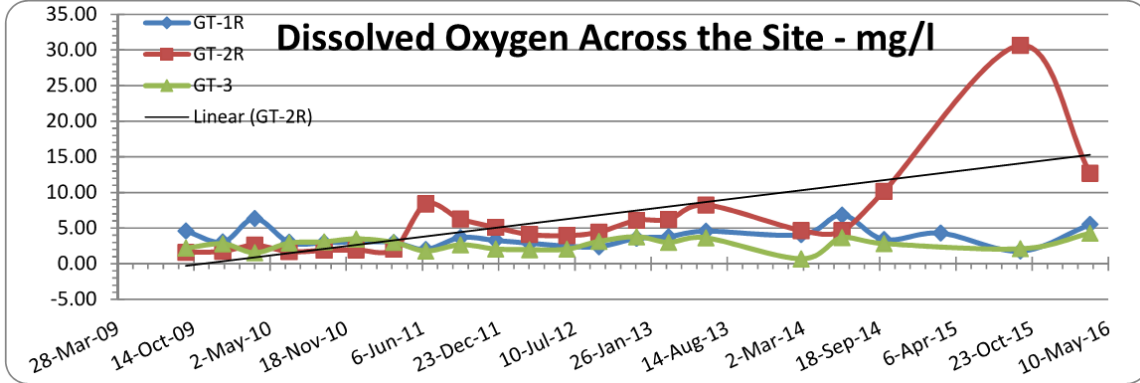
The pH across the Site (wells GT-1R, GT-2R and GT-3) is presented below in **Figure 2**. The most pronounced fluctuation in pH occurs at well GT-2R where the ORC-A® media appears to be locally influencing the pH, a common occurrence with application of this product.

**Figure 2**



DO trends for wells GT-1R, GT-2R and GT-3 are presented below as **Figure 3**. Fluctuations in DO measured at GT-2R are likely due to the dissolution of the ORC®-A media.

**Figure 3**



**GROUNDWATER SAMPLING**

Each well sampled was purged of 3 to 5 well volumes (conditions permitting) of groundwater with a submersible pump or bailer prior to sampling. Samples were collected with dedicated polyethylene bailers and placed into laboratory-supplied glass containers. Samples were sent to Test America, Inc. (TA) in Edison, New Jersey for analysis of Volatile Organic Compounds (VOCs) by EPA Method 8260c and Mineral Spirit Range Organics (MSRO) by EPA Method 8215d<sup>2</sup>. TA holds New York NELAP and NYDOH laboratory certifications. Samples were kept cool during transport to the

<sup>2</sup> Safety-Kleen was advised by TA that as of 2016, MSRO analysis was transitioning from EPA Method 8260b to EPA Method 8015d.

laboratory's courier and were accompanied by chain-of-custody documents and a trip blank.

## GROUNDWATER ANALYTICAL RESULTS

Groundwater analytical data are presented in **Attachment 3, Table 2**. The laboratory analytical report is included as **Attachment 4** (Executive Summary in hard copy, full report on CD). No analytical or quality issues were noted by the laboratory for site-related constituents.

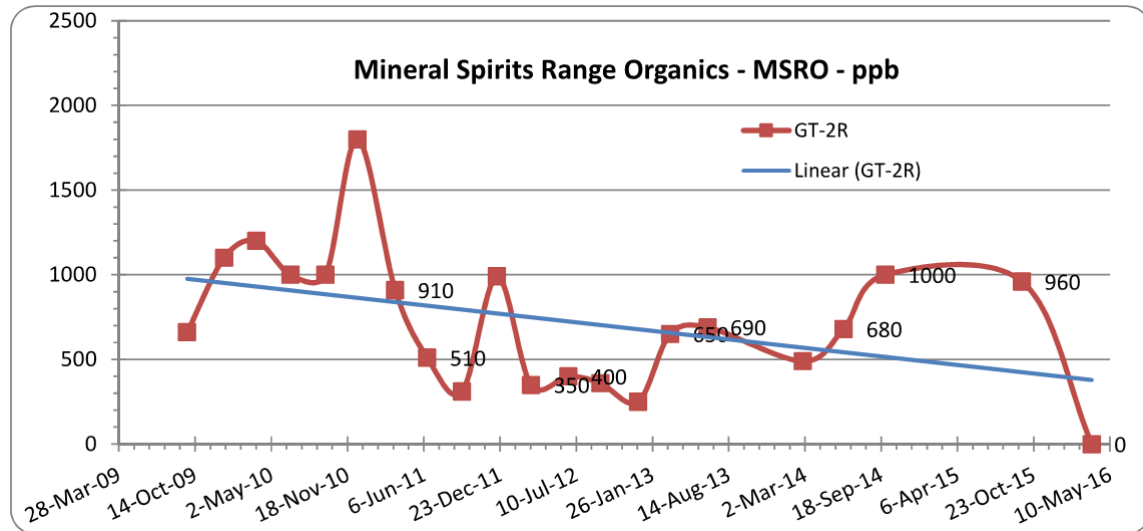
### VOCs

Low concentrations of VOCs were reported detected in samples from wells GT-1R and GT-2R. Similar to previous events, target compounds were not detected above the laboratory reporting limits or regulatory standards in any monitoring wells.

### MSRO

For the March 2016 monitoring event, MSRO was not detected above the laboratory reporting limit in any of the wells in the monitoring program. The concentration of MSRO at well GT-2R from 2009 through the present is provided below in **Figure 4**, and exhibits a declining trend assisted by redevelopment prior to sampling in March 2016.

**Figure 4**



## GROUNDWATER SAMPLING SUMMARY

1. Depth to water across the Site generally stayed within the typical ranges historically recorded on-site (7 – 10 feet below grade). Direction of flow trended toward the west-northwest, as observed historically.
2. The groundwater pH was generally within the range for naturally occurring groundwater, with the exception of well GT-2R where elevated pH is believed due to

dissolution of ORC-A® media socks deployed in the well. Likewise, DO at well GT-2R fluctuates due to ORC-A® media influencing the groundwater.

3. Trace concentrations of VOCs were reported detected in some wells, but none above the laboratory reporting limits or at concentrations above the New York State groundwater quality standards. The trace detections, particularly Tetrachloroethene and associated breakdown products, may be indicative of a regional matter not associated with former Safety-Kleen Site operations.
4. For the monitoring event reported herein (March 2016), MSRO was compliant with criteria in all wells monitored.

## CONCLUSIONS

The MSRO concentrations in well GT-2R, following redevelopment in March 2016 and with ORC-A® filter socks deployed in the well, have declined since the socks were first deployed in 2011; the DO generated during dissolution of the ORC-A® media appears to be effective in lowering MSRO concentrations.

## RECOMMENDATIONS

1. Continue the groundwater monitoring program and conduct sampling in December 2016, and March and September 2017.
2. Change, as needed, the ORC-A® filter socks at well GT-2R.

If you should have any questions or comments concerning this report, please do not hesitate to contact me at (513) 956-2172. As always, we appreciate the Department's assistance with this Site.

Sincerely,

## Safety-Kleen Systems, Inc.



**Stephen D. Fleming, PE, CHMM**  
Senior Remediation Manager

**Copy:** J. Riedy, USEPA, New York, NY  
C. Lichti, Duro Electric, Thornwood, NY  
N. Nelhuebel, VP Environmental Liabilities, Clean Harbors, Norwell, MA (CD)  
A. Proctor, Woodard & Curran, Cheshire, CT

## **Figures**

1. Depth to Water Across the Site
2. pH Across the Site
3. Dissolved Oxygen Across the Site
4. Mineral Spirit Range Organics Across the Site

## **Attachments**

1. Maps
  - Monitoring Well Locations
  - Groundwater Contour Map – 3/23/16
2. Field Data Summaries
3. Tables
  - Table 1 – Field Data Water Quality
  - Table 2 – Compiled Chemical Data
4. Laboratory Report – On Attached Compact Disk – (Executive Summaries in Print)

**ATTACHMENT 1:**

**1a. Monitoring Well Locations**

**1b. Groundwater Contour Map – 3/23/16**





Garage w/  
Offices Above

Two Story Concrete  
Block Building with  
Offices

GT-1R

GT-2R

GT-3

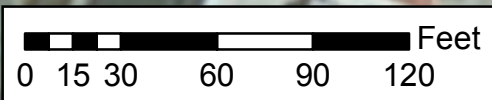
GT-5

GT-4

St. Charles St.

Franklin Ave

Marble Ave



**MONITORING WELL LOCATIONS  
FORMER SAFETY-KLEEN SYSTEMS, INC.  
THORNWOOD, NY**

SCALE: 1" = 60'

DATE: JANUARY 2016

DRAWN BY: MJO

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



STORE

STORE

STORE

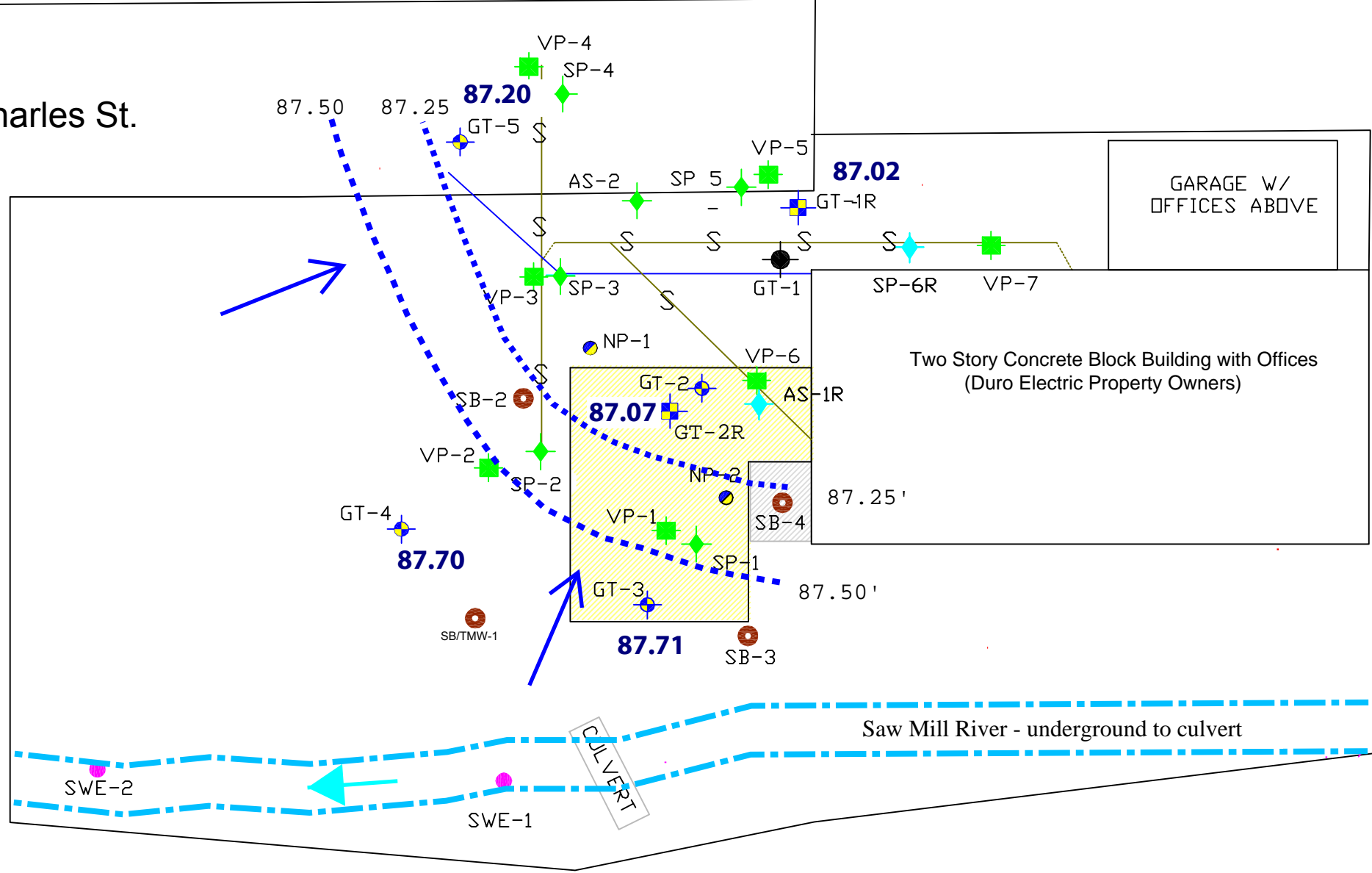
St. Charles St.

Gas Station Parking Lot

GARAGE W/  
OFFICES ABOVE

Two Story Concrete Block Building with Offices  
(Duro Electric Property Owners)

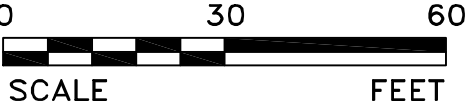
WALNUT PLACE



**LEGEND**

- MONITORING WELL
- REPLACEMENT MONITORING WELL
- ABANDONED MONITORING WELL
- MONITORING POINT (DEEP/SHALLOW)
- SOIL BORING
- VAPOR POINT
- SPARGE WELL
- REPLACEMENT SPARGE WELL (2" PVC)
- RIVER SAMPLING LOCATION
- 88.00** GROUNDWATER ELEVATION (feet)
- GROUNDWATER ELEVATION CONTOUR
- DIRECTION OF GROUNDWATER FLOW
- APPROXIMATE LOCATION OF CONCRETE PAD
- APPROXIMATE EXCAVATION LOCATION
- APPROXIMATE SEWER LINE LOCATION
- APPROXIMATE GAS LINE LOCATION

**Average Gradient: 1.4%**



APPROX.



**Former  
Safety-Kleen Systems, Inc.  
Thornwood, NY**

**Groundwater Contour Map - 3/23/16**

Date: 7/19/13	Drawn By: JLB			Scale: as shown
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Source - SKI, Revised: BES-6/11/13

**ATTACHMENT 2**  
**Field Data Summaries**

Monitoring Well Redevelopment Summary  
Safety-Kleen (Thornwood, NY)

Site	Date	Well ID	PID (ppm)	DTW ('bToC)	DTP	DTB ('bToC)	ORC Socks?	Estimated Well Volumes Removed	Estimated Gallons Removed	General Condition/Notes
Thornwood, NY	3/14/2016	GT-2R	0	11.64	--	15.11	Yes	4	2.72	Screws missing from well cover; otherwise, good condition/recharge.

**NOTES:**

PID - Photoionization Detector

ppm - parts per million

DTW - Depth to Water

DTP - Depth to Product

DTB - Depth to Bottom

'bToC - feet below top of casing

900  
930  
2301

GROUNDWATER SAMPLING RECORD

SITE NAME	Former Safety-Kleen Service Center	DATE	3/23/16
	27 St. Charles Street, Thornwood, NY	Weather	Clear, 60°F, No wind

Samplers Jon Wylie + Ed Brodzinski

28.29 15.15 16.21 16.40 24.52

Well Name / ID	GT-1R	GT-2R	GT-3	GT-4	GT-5		
Lab Analysis - EPA 8260b VOCs	Yes	Yes	Yes	Yes	Yes		
Lab Analysis - EPA 8015b MSRO	Yes	Yes	Yes	Yes	Yes		
Duplicate Sample:		Yes					
Diameter of Well Casing	2 in	2 in	2 in	2 in	2 in		
Depth of Well (ft.)	28.40	23.40	19.20	16.5	24.65		
ORC Socks - Remove Prior and Replace Post		Yes					
Depth to Groundwater (ft.)	11.23	11.06	9.26	8.18	9.28		
Water Column Height (ft.)	28.40	23.40	19.20	16.50	24.65		
Volume Purged (gal)	8.50	3.00*	3.50	4.25	7.50		
Purging Method	Bailer	Bailer	Bailer	Bailer	Bailer		
Sample Time	1745	1800	1700	1715	1630		
Sample date	3/23	3/23	3/23	3/23	3/23		
GW Visual Observations							
color	Tan/gray	white	Orange/tan	Orange/tan	Brown/gray		
sheen	No	NO	No	No	No		
odor	No	NO	No	No	No		
Field Parameters							
Temperature (C)	12.99	12.72	10.17	10.60	12.70		
pH	9.46	12.18	6.99	7.04	1371 <sup>1.75</sup>		
Conductivity (uS)	968	2742	998	914	1371		
Dissolved Oxygen (mg/L)	5.51	12.71	4.28	4.75	8.20		
ORP (Eh (Mv))	52.4	19.4	34.9	40.1	166.6		
Turbidity (visual)	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy		

Comments

- GW-DUP collected from GT-2R. Seeping collected @ 1200
- ORC socks replaced in GT-2R following sampling changed

Complete field data in these rows.  
Collect duplicate sample as indicated. A rinse blank is not needed if dedicated bailers are used to sample wells. Changeout ORC socks every 6 months.

# **ATTACHMENT 3**

## **Tables**

**Table 1 - Field Data Water Quality Key**

Temperature recorded in °C  
 Conductivity measured in µS  
 Dissolved Oxygen measured in mg/L  
 Eh measured in mV  
 Ozone measured in mg/L

GT-1R	Compound							
Sampling Date	Depth to Water (ft)	Water Table Elevation	Temperature °	pH	Cond.	D.O.	Eh	Ozone
06-Jul-05	11.33	86.92	13.0	7.23	683	3.35	n/m	n/m
20-Sep-05	12.47	85.78	15.3	7.41	658	3.75	95	over range
12-Dec-05	10.74	87.51	12.7	8.01	563	4.20	100	n/m
15-Mar-06	10.49	87.76	11.5	7.24	1143	5.15	146	0.15
22-Jun-06	10.80	87.45	14.0	7.07	1285	5.42	152	0.21
25-Sep-06	10.89	87.36	14.4	7.02	1464	3.83	429	n/m
18-Dec-06	10.60	87.65	14.1	7.18	1344	3.85	-116	n/m
26-Mar-07	10.23	88.02	12.5	7.07	1191	2.80	-28	n/m
25-Jun-07	10.92	87.33	13.6	7.06	1049	2.06	-3	n/m
19-Sep-07	11.68	86.57	15.8	7.21	1303	3.11	-35	n/m
21-Dec-07	11.69	86.56	13.8	7.11	1122	3.10	-10	n/m
28-Mar-08	10.42	87.83	12.3	7.04	814	2.85	-98	n/m
18-Jun-08	11.23	87.02	13.0	7.19	1062	3.00	-100	n/m
24-Sep-08	11.30	86.95	14.4	6.96	1422	3.90	160	n/m
17-Dec-08	10.54	87.71	12.9	7.28	978	2.92	88	n/m
11-Mar-09	10.09	88.16	11.7	7.23	1458	2.74	122	n/m
16-Jun-09	10.75	87.50	13.0	7.15	1370	3.42	72	n/m
23-Sep-09	11.06	87.19	14.0	7.97	1542	4.60	37	n/m
29-Dec-09	9.94	88.31	12.5	7.30	1185	3.05	85	n/m
23-Mar-10	8.91	89.34	11.2	7.05	1058	6.36	101	n/m
21-Jun-10	10.93	87.32	12.9	7.38	811	3.02	-125	n/m
21-Sep-10	11.81	86.44	13.8	7.57	728	2.95	-105	n/m
14-Dec-10	11.04	87.21	13.4	7.68	698	3.08	-100	n/m
23-Mar-11	9.45	88.80	10.4	7.20	839	2.99	-75	n/m
15-Jun-11	10.20	88.05	12.6	7.45	580	2.02	-25	n/m
14-Sep-11	9.02	89.23	16.0	7.34	574	3.68	-42	n/m
15-Dec-11	9.58	88.67	14.3	7.42	505	3.28	-15	n/m
13-Mar-12	10.61	87.64	12.6	7.08	491	2.88	-44	n/m
19-Jun-12	10.99	87.26	14.0	7.24	514	2.47	-50	n/m
11-Sep-12	11.31	86.94	14.1	7.58	603	2.40	-69	n/m
19-Dec-12	10.92	87.33	13.1	7.04	505	3.55	-15	n/m
13-Mar-13	10.38	87.87	11.8	7.22	513	3.80	-10	n/m
19-Jun-13	9.83	88.42	13.4	7.46	654	4.58	-14	n/m
24-Feb-14	11.10	87.15	11.9	7.70	450	4.07	147	n/m
11-Jun-14	10.74	87.51	12.7	7.18		6.84	124.1	n/m
29-Sep-14	11.80	86.45	14.3	7.86	1126	3.40	114	n/m
25-Feb-15	11.52	86.73	12.1	7.54	697	4.30	94.3	n/m
22-Sep-15	11.83	86.42	14.03	6.67	903	1.77	51.6	n/m
23-Mar-16	11.23	87.02	12.99	9.46	968	5.51	52.4	n/m



GT-2R	Compound							
Sampling Date	Depth to Water (ft)	Water Table Elevation	Temperature °	pH	Cond.	D.O.	Eh	Ozone
06-Jul-05	11.09	87.04	13.4	7.05	773	2.2	n/m	n/m
20-Sep-05	11.60	86.53	17.3	7.13	787	2.40	<-80	0.09
12-Dec-05	10.00	88.13	11.0	7.33	641	1.81	<-80	n/m
15-Mar-06	NS	NS	NS	NS	NS	NS	NS	NS
22-Jun-06	10.60	87.53	16.0	7.01	1350	4.25	-50	0.2
25-Sep-06	10.73	87.40	17.0	7.06	1275	2.30	-65	n/m
18-Dec-06	10.45	87.68	14.5	7.09	1274	2.80	-100	n/m
26-Mar-07	10.05	88.08	12.4	7.03	1169	2.15	-110	n/m
25-Jun-07	10.71	87.42	14.0	7.1	1194	3.00	-140	n/m
19-Sep-07	11.49	86.64	16.9	7.02	1133	2.95	-100	n/m
19-Dec-07	11.48	86.65	15.3	7.07	863	2.95	-75	n/m
28-Mar-08	10.26	87.87	12.3	7.05	941	2.56	-157	n/m
18-Jun-08	11.00	87.13	13.2	7.02	1047	2.85	-150	n/m
24-Sep-08	11.12	87.01	16.7	6.79	969	1.81	-88	n/m
17-Dec-08	10.38	87.75	14.5	7.01	1015	1.74	-87	n/m
11-Mar-09	9.90	88.23	10.8	7.20	951	1.95	-58	n/m
16-Jun-09	10.56	87.57	13.2	7.81	1156	2.18	-140	n/m
23-Sep-09	10.88	87.25	16.2	7.71	1353	1.58	-163	n/m
29-Dec-09	9.75	88.38	13.5	7.05	1250	1.75	-75	n/m
23-Mar-10	8.71	89.42	10.8	7.06	1333	2.60	-50	n/m
21-Jun-10	10.80	87.33	13.4	7.03	1184	1.71	-25	n/m
21-Sep-10	11.62	86.51	17.0	7.04	1009	1.88	-50	n/m
14-Dec-10	10.88	87.25	14.3	7.08	839	1.95	-75	n/m
23-Mar-11	9.24	88.89	11.0	7.02	795	2.05	-58	n/m
15-Jun-11	10.03	88.10	13.3	7.32	762	8.38	10	n/m
14-Sep-11	8.85	89.28	17.5	7.23	755	6.28	-115	n/m
15-Dec-11	9.40	88.73	15.0	7.69	654	5.10	-109	n/m
13-Mar-12	10.43	87.70	13.0	7.11	634	4.11	-10	n/m
19-Jun-12	10.83	87.30	15.2	7.34	705	3.95	-22	n/m
11-Sep-12	11.12	87.01	17.2	7.90	689	4.44	-31	n/m
19-Dec-12	10.78	87.35	14.5	10.42	905	6.10	110	n/m
13-Mar-13	10.23	87.90	11.6	11.29	1388	6.20	105	n/m
19-Jun-13	9.74	88.39	13.5	11.12	1336	8.25	88	n/m
24-Feb-14	11.06	87.07	10.3	7.82	480	4.67	96	n/m
11-Jun-14	10.58	87.55	12.7	8.86	n/m	4.60	-4.9	n/m
29-Sep-14	11.60	86.53	17.6	12.20	3816	10.17	114	n/m
22-Sep-15	11.80	86.33	17.07	11.30	1015	30.66	-89.8	n/m
23-Mar-16	11.06	87.07	12.72	12.18	2742	12.71	19.4	n/m

GT-3	Compound							
Sampling Date	Depth to Water (ft)	Water Table Elevation	Temperature °	pH	Cond.	D.O.	Eh	Ozone
06-Jul-05	9.58	87.39	13.4	7.15	561	2.22	n/m	n/m
20-Sep-05	10.50	86.47	18.8	7.43	525	2.21	<-80	0.27
12-Dec-05	9.10	87.87	12.5	7.23	507	2.81	<-80	n/m
15-Mar-06	8.73	88.24	10.1	6.98	913	2.90	-8	>1.5
22-Jun-06	9.05	87.92	14.0	6.92	847	3.58	-53	>1.5
25-Sep-06	9.15	87.82	17.0	7.04	707	3.55	-73	n/m
18-Dec-06	8.98	87.99	15.0	7.04	800	2.48	-122	n/m
26-Mar-07	8.33	88.64	10.5	7.03	722	2.50	-115	n/m
25-Jun-07	9.18	87.79	12.8	7.07	830	2.77	-123	n/m
19-Sep-07	9.99	86.98	17.8	7.12	646	2.88	-95	n/m
19-Dec-07	10.07	86.9	13.7	7.07	678	2.47	-105	n/m
28-Mar-08	8.63	88.34	9.8	7.09	903	2.45	-170	n/m
18-Jun-08	9.35	87.62	12.6	7.04	870	2.95	-125	n/m
24-Sep-08	9.50	87.47	17.5	6.74	854	1.93	-47	n/m
17-Dec-08	8.65	88.32	12.8	6.99	1310	1.89	-25	n/m
11-Mar-09	7.73	89.24	9.0	7.10	1301	1.80	52	n/m
16-Jun-09	8.81	88.16	11.0	8.17	717	0.60	-79	n/m
23-Sep-09	9.23	87.74	16.2	8.09	650	2.20	-109	n/m
29-Dec-09	8.05	88.92	14.0	7.44	785	2.80	-59	n/m
23-Mar-10	7.02	89.95	8.7	7.05	933	1.55	-24	n/m
21-Jun-10	9.05	87.92	13.5	6.90	854	2.90	-154	n/m
21-Sep-10	9.83	87.14	17.5	7.05	383	3.08	-150	n/m
14-Dec-10	9.08	87.89	14.6	7.60	596	3.50	-125	n/m
23-Mar-11	7.71	89.26	9.0	8.01	729	3.01	-85	n/m
15-Jun-11	8.43	88.54	11.5	7.03	714	1.80	-45	n/m
14-Sep-11	7.39	89.58	18.4	7.30	636	2.67	-40	n/m
15-Dec-11	7.85	89.12	15.1	7.03	630	2.08	-48	n/m
13-Mar-12	8.74	88.23	11.2	7.03	527	1.98	-22	n/m
19-Jun-12	9.10	87.87	14.0	7.50	492	2.05	-10	n/m
11-Sep-12	9.53	87.44	18.0	7.10	488	3.15	-174	n/m
19-Dec-12	9.09	87.88	13.2	7.04	400	3.80	25	n/m
13-Mar-13	8.36	88.61	9.0	7.42	369	3.01	10	n/m
19-Jun-13	8.03	88.94	12.3	7.10	543	3.64	6	n/m
24-Feb-14	9.06	87.91	8.5	8.82	471	0.70	-11	n/m
11-Jun-14	8.72	88.25	12.0	6.55	n/m	3.66	-45.9	n/m
29-Sep-14	9.96	87.01	17.8	8.28	907	2.83	-94.8	n/m
22-Sep-15	9.90	87.07	17.52	8.82	1268	2.11	-175.3	n/m
23-Mar-16	9.26	87.71	10.17	6.99	998	4.28	34.9	n/m

GT-4	Compound							
Sampling Date	Depth to Water Table							
	Water (ft)	Elevation	Temperature °	pH	Cond.	D.O.	Eh	Ozone
06-Jul-05	8.28	87.60	12.7	7.03	697	2.92	n/m	n/m
20-Sep-05	9.19	86.69	17.4	7.23	680	2.10	15	-0.42
12-Dec-05	7.77	88.11	13.5	7.35	603	3.00	50	n/m
15-Mar-06	7.66	88.22	11.2	7.00	1036	3.10	40	0.4
22-Jun-06	7.90	87.98	13.5	7.15	1049	3.90	-23	>1.5
25-Sep-06	7.94	87.94	16.5	7.04	1025	4.00	60	n/m
18-Dec-06	7.80	88.08	14.8	7.02	851	2.95	-88	n/m
26-Mar-07	7.30	88.58	10.5	7.03	703	3.15	-81	n/m
25-Jun-07	7.95	87.93	13	7.07	1144	3.06	-66	n/m
19-Sep-07	8.58	87.30	17.2	7.03	1087	3.85	-60	n/m
19-Dec-07	8.55	87.33	14.7	7.07	826	3.05	-60	n/m
28-Mar-08	7.56	88.32	9.3	7.06	1040	3.55	-120	n/m
18-Jun-08	8.12	87.76	12.3	7.04	1021	3.65	-105	n/m
24-Sep-08	8.26	87.62	16.4	6.77	1199	1.39	62	n/m
17-Dec-08	7.56	88.32	13.5	7.15	762	2.25	26	n/m
11-Mar-09	6.97	88.91	9.1	7.15	1465	3.58	47	n/m
16-Jun-09	7.75	88.13	11.5	7.96	1158	1.00	-9	n/m
23-Sep-09	8.10	87.78	14.6	7.94	662	1.95	-21	n/m
29-Dec-09	7.14	88.74	13.5	7.55	725	2.25	15	n/m
23-Mar-10	6.07	89.81	9.5	7.05	844	2.18	57	n/m
21-Jun-10	7.94	87.94	12.0	7.04	1392	2.56	-110	n/m
21-Sep-10	8.64	87.24	13.2	7.03	901	3.20	-95	n/m
14-Dec-10	8.03	87.85	14.8	7.38	728	3.08	-90	n/m
23-Mar-11	6.84	89.04	9.8	7.81	670	3.85	-70	n/m
15-Jun-11	7.50	88.38	11.6	7.06	914	0.86	-20	n/m
14-Sep-11	6.51	89.37	16.8	7.04	761	1.06	-117	n/m
15-Dec-11	6.94	88.94	15.1	7.05	698	2.85	-95	n/m
13-Mar-12	7.78	88.10	12.7	7.08	665	2.81	-88	n/m
19-Jun-12	8.07	87.81	13.5	7.48	588	2.60	-35	n/m
11-Sep-12	8.31	87.57	17.0	7.41	548	2.30	-97	n/m
19-Dec-12	7.97	87.91	14.0	7.07	459	3.10	60	n/m
13-Mar-13	7.34	88.54	10.1	7.13	471	3.55	60	n/m
19-Jun-13	7.18	88.70	11.6	7.30	540	2.40	47	n/m
24-Feb-14	7.95	87.93	9.6	7.92	459	4.97	83	n/m
11-Jun-14	7.78	88.10	9.4	6.70		3.26	28.1	n/m
29-Sep-14	8.86	87.02	16.9	8.00	788	3.14	-39.7	n/m
25-Feb-15	8.42	87.46	9.12	7.57	518	7.56	51.3	n/m
22-Sep-15	8.67	87.21	16.87	6.88	892	2.76	65	n/m
23-Mar-16	8.18	87.70	10.60	7.04	914	4.75	40.1	n/m

GT-5	Compound							
Sampling Date	Depth to Water (ft)	Water Table Elevation	Temperature °	pH	Cond.	D.O.	Eh	Ozone
06-Jul-05	9.35	87.13	13.6	7.23	867	3.79	n/m	n/m
20-Sep-05	9.70	86.78	16.0	7.33	800	3.28	85	0.27
12-Dec-05	8.80	87.68	13.0	7.61	633	2.70	95	n/m
15-Mar-06	8.56	87.92	11.8	7.03	1438	4.91	108	0.20
22-Jun-06	8.84	87.64	15.0	6.90	1489	4.22	151	0.11
25-Sep-06	8.98	87.50	15.0	7.05	1438	4.15	82	n/m
18-Dec-06	8.65	87.83	13.3	7.21	1132	2.50	-28	n/m
26-Mar-07	8.27	88.21	12.4	7.06	1062	2.50	-61	n/m
25-Jun-07	8.97	87.51	14.5	7.08	1243	2.25	-8	n/m
19-Sep-07	9.75	86.73	15.1	7.13	1161	2.80	-50	n/m
19-Dec-07	9.78	86.7	13.2	7.05	1037	3.05	-60	n/m
28-Mar-08	8.44	88.04	12.6	7.05	950	2.88	-91	n/m
18-Jun-08	9.27	87.21	13.8	7.03	1126	3.05	-65	n/m
24-Sep-08	9.35	87.13	15.4	6.72	1336	2.80	142	n/m
17-Dec-08	8.60	87.88	12.9	7.00	1288	3.40	-73	n/m
11-Mar-09	8.11	88.37	12.2	7.25	1171	3.05	108	n/m
16-Jun-09	8.80	87.68	12.9	7.87	1095	1.61	40	n/m
23-Sep-09	9.11	87.37	14	7.88	1173	2.68	19	n/m
29-Dec-09	8.00	88.48	12.5	7.75	1255	2.95	-15	n/m
23-Mar-10	6.94	89.54	11.7	7.03	776	0.96	86	nm
21-Jun-10	9.01	87.47	13.7	7.02	1304	3.10	-123	n/m
21-Sep-10	9.86	86.62	14.5	7.32	897	3.20	-130	n/m
14-Dec-10	9.10	87.38	13.3	7.5	764	3.30	-108	n/m
23-Mar-11	7.51	88.97	10	7.53	759	4.22	-100	n/m
15-Jun-11	8.25	88.23	13.3	7.12	786	1.78	-60	n/m
14-Sep-11	7.09	89.39	14.2	7.23	580	1.46	-83	n/m
15-Dec-11	7.61	88.87	14.3	7.35	585	1.86	-102	n/m
13-Mar-12	8.64	87.84	13.2	7.07	627	2.05	-85	n/m
19-Jun-12	9.04	87.44	14.5	7.19	706	2.50	-60	n/m
11-Sep-12	9.40	87.08	15.0	7.61	744	3.20	-72	n/m
19-Dec-12	8.98	87.50	13.2	7.07	531	2.55	40	n/m
13-Mar-13	8.41	88.07	11.8	7.15	512	2.88	10	n/m
19-Jun-13	7.92	88.56	13.8	7.33	556	3.66	2	n/m
24-Feb-14	9.13	87.35	11.5	7.74	486	4.97	136	n/m
11-Jun-14	8.79	87.69	13.35	6.88	n/m	5.19	117.6	n/m
29-Sep-14	9.82	86.66	15.21	8.14	1157	3.85	115.6	n/m
22-Sep-15	9.83	86.65	15.33	7.04	1585	9.36	-56.8	n/m
23-Mar-16	9.28	87.20	12.70	7.75	1371	6.20	166.6	n/m

Table 2  
Compiled Chemical Data

T.O.G.S 1.1.1 Standards		Volatile Organic Compounds Method 8260B (ug/L)																								
Sample ID	Sample Date	50	5	60	5	7	3	3	3	5	1	5	2	5	5	5	5	1	5	5	2	5	5	50		
		Acetone	Bromomethane	Carbon Disulfide	Chlorobenzene	Chloroform	1,2-Dichloro- benzene	1,3-Dichloro- benzene	1,4-Dichloro- benzene	1,1- Dichloroethane	1,2- Dichloroethane	1,1- Dichloroethane	1,2- Dichloroethane, Total	Ethyl Benzene	Methylene Chloride	O-Xylene	Tetrachloro- ethene	1,1,1- Trichloroethane	1,1,2- Trichloroethane	Trichloroethene	Toluene	Vinyl Chloride	Total Xylenes	cis-1,2- Dichloroethene	Iodomethane	Mineral Spirits
GT-1	12/13/1993	NA	NA	NA	NA	NA	100	NA	33	67	NA	NA	NA	170	NA	NA	140	240	NA	22	11	ND	680	64	NA	NA
GT-1	7/6/1994	NA	NA	NA	NA	NA	75	6	ND	66	NA	NA	NA	60	NA	NA	110	160	NA	17	ND	ND	190	ND	NA	740
GT-1	10/19/1994	NA	NA	NA	NA	NA	150	10	4	56	NA	NA	NA	120	NA	NA	110	210	NA	19	ND	ND	300	ND	NA	900
GT-1	1/26/1995	NA	NA	NA	NA	NA	90	7	35	47	NA	NA	NA	120	NA	NA	130	160	NA	23	ND	ND	110	34	NA	310
GT-1	4/13/1995	NA	NA	NA	NA	NA	93	6	36	64	NA	2	NA	130	NA	NA	120	230	NA	24	ND	ND	170	59	NA	250
GT-1	7/25/1995	NA	NA	NA	ND	NA	65	10	ND	72	2	4	NA	ND	NA	NA	88	ND	ND	24	ND	ND	ND	16	NA	7793
GT-1	1/23/1996	NA	NA	NA	7	ND	64	7	27	47	2	2	NA	ND	NA	NA	66	ND	ND	17	ND	3	ND	112	NA	5220
GT-1	4/23/1996	NA	NA	NA	3	ND	92	5	51	9	ND	ND	NA	ND	NA	NA	68	ND	ND	21	ND	ND	ND	5	NA	1040
GT-1	7/18/1996	NA	NA	NA	ND	NA	6	ND	6	3	NA	6	NA	5	NA	NA	ND	5	6	ND	ND	ND	5	ND	NA	ND
GT-1	10/8/1996	NA	NA	NA	4	ND	22	5	19	10	ND	ND	NA	25	NA	NA	64	20	ND	7	ND	ND	2	3	NA	709
GT-1	1/7/1997	NA	NA	NA	8	ND	55	8	37	14	ND	ND	NA	60	NA	NA	103	58	ND	16	2	ND	17	16	NA	350
GT-1	4/1/1997	NA	NA	NA	6	2	59	7	43	11	ND	ND	NA	50	NA	NA	99	38	ND	14	ND	ND	5	55	NA	2030
GT-1	7/1/1997	NA	NA	NA	5	ND	35	7	27	8	ND	ND	NA	38	NA	NA	60	20	ND	9	ND	ND	32	557	NA	370
GT-1	10/29/1997	NA	NA	NA	5	ND	57	7	39	7	ND	ND	NA	59	NA	NA	6	16	ND	3	2	4	46	157	NA	190
GT-1	1/14/1998	NA	NA	NA	4	ND	46	5	30	6	ND	ND	NA	59	NA	NA	5	13	ND	2	1	10	49	352	NA	119
GT-1	4/10/1998	NA	NA	NA	2	ND	44	5	19	5	ND	1	NA	73	NA	NA	9	20	ND	3	8	7	71	352	NA	222
GT-1	7/22/1998	NA	NA	NA	6	ND	26	5	19	4	ND	2	NA	50	NA	NA	2	7	ND	2	ND	3	40	474	NA	1750
GT-1	10/14/1998	NA	NA	NA	6	ND	42	7	26	5	ND	1	NA	50	NA	NA	ND	10	ND	ND	1	88	47	759	NA	430
GT-1	DUPLICATE	NA	NA	NA	4	ND	43	6	29	4	ND	ND	NA	64	NA	NA	ND	8	ND	ND	ND	110	52	390	NA	260
GT-1	1/6/1999	NA	NA	NA	8	ND	57	7	29	6	ND	ND	NA	82	NA	NA	ND	25	ND	ND	3	160	76	497	NA	490
GT-1	DUPLICATE	NA	NA	NA	5	ND	48	5	29	4	ND	ND	NA	81	NA	NA	ND	17	ND	ND	3	190	66	310	NA	1
GT-1	4/7/1999	NA	NA	NA	6	NA	73	6	26	5	NA	ND	NA	65	NA	NA	3	14	ND	1	2	116	86	246	NA	1080
GT-1	DUPLICATE	NA	NA	NA	4	ND	46	5	27	3	ND	ND	NA	66	NA	NA	ND	11	ND	ND	2	220	60	180	NA	1
GT-1	7/1/1999	NA	NA	NA	ND	ND	57	ND	35	ND	ND	ND	NA	88	NA	NA	ND	16	ND	ND	ND	83	110	75	NA	646
GT-1	DUPLICATE	NA	NA	NA	ND	ND	64	ND	38	ND	ND	ND	NA	92	NA	NA	ND	17	ND	ND	ND	88	110	93	NA	1080
GT-1	10/28/1999	NA	NA	NA	3	ND	39	6	32	2	ND	ND	NA	59	NA	NA	ND	2	ND	ND	1	14	69	35	NA	ND
GT-1	DUPLICATE	NA	NA	NA	3	ND	43	5	24	ND	ND	ND	NA	62	NA	NA	ND	NA	ND	ND	ND	20	68	39	NA	220
GT-1	12/8/1999	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	4	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	2/9/2000	NA	NA	NA	ND	2	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	7	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	DUPLICATE	NA	NA	NA	ND	2	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	8	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	4/27/2000	NA	NA	NA	ND	4	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	12	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	6/27/2000	NA	NA	NA	ND	2	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	15	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	DUPLICATE	NA	NA	NA	ND	2	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	13	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	10/18/2000	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	3	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	DUPLICATE	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	3	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	1/11/2001	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	4	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	DUPLICATE	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	4	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	4/18/2001	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	9	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	DUPLICATE	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	9	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	8/14/2001	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	3	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	11/6/2001	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	17	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	DUPLICATE	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	15	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	5/7/2002	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	10	ND	ND	ND	ND	ND	ND	ND	NA	ND
GT-1	DUPLICATE	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	10	ND	ND	ND	ND	ND	ND	ND	NA	ND















**ATTACHMENT 4**  
**Laboratory Report**  
**On – Compact Disk**  
**(Executive Summary Printed)**



## ANALYTICAL REPORT

Job Number: 460-111093-1

Job Description: 2016 Safety-Kleen Thornwood

For:

Safety-Kleen Systems, Inc  
4120 Thunderbird Ln  
Fairfield, OH 45014

Attention: Mr. Steve Fleming, P.E.

*Melissa Haas*

Approved for release.  
Melissa Haas  
Project Manager I  
4/6/2016 10:39 AM

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Melissa Haas, Project Manager I  
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04/06/2016

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**TestAmerica Laboratories, Inc.**

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## EXECUTIVE SUMMARY - Detections

Client: Safety-Kleen Systems, Inc

Job Number: 460-111093-1

Lab Sample ID Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
<b>460-111093-1</b> Tetrachloroethene	<b>GT-1R</b>	1.5	J	5.0	ug/L	8260C
<b>460-111093-2</b> Chlorobenzene	<b>GT-2R</b>	2.7	J	5.0	ug/L	8260C
1,2-Dichlorobenzene		0.32	J	3.0	ug/L	8260C
1,4-Dichlorobenzene		1.0	J	3.0	ug/L	8260C
<b>460-111093-6</b> Chlorobenzene	<b>GW-DUP</b>	2.7	J	5.0	ug/L	8260C
1,2-Dichlorobenzene		0.31	J	3.0	ug/L	8260C
1,4-Dichlorobenzene		0.91	J	3.0	ug/L	8260C