8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP16 | Project: GAS WORKS PARK

Ical Midpoint ID: 0101120 | Ical Date: 11/20/14

Instrument ID: NT5 | Project Run Date: 11/20/14

		IS4 (DCB) AREA	#	RT	#	AREA	#	RT	#	AREA	#	RT	#
	ICAL MIDPT	450241		10.09									
	UPPER LIMIT	900482		10.59									
	LOWER LIMIT	225120		9.59									
	Sample ID												
01	ICV1120	439864		10.10									
02													
03													
04													
05													
06													
07													
08													
09													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Ical Midpoint ID: 0101120 Ical Date: 11/20/14

Instrument ID: NT5 Project Run Date: 12/23/14

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	278101	5.12	699590	5.56	830842	8.00
	UPPER LIMIT	556202	5.62	1399180	6.06	1661684	8.50
	LOWER LIMIT	139050	4.62	349795	5.06	415421	7.50
	Sample ID						
01	LCS1223	323993	5.10	755787	5.54	891500	8.00
02	LCS1223	337273	5.10	743468	5.54	877367	8.00
03	MB1223	330975	5.10	725983	5.54	846797	8.00
04	TRIP BLANK	338590	5.10	750224	5.54	903637	8.00
05	TRIP BLANK	338148	5.10	742084	5.54	890917	8.00
06	TRIP BLANKS	339834	5.10	747684	5.54	899415	8.00
07	PAI-9-12.5-1	322013	5.11	726128	5.55	878152	8.00
08	PAI-10-9.5-1	315283	5.11	705273	5.55	837662	8.00
09	PAI-8-14.5-1	322197	5.10	699771	5.54	820479	8.00
10	PAI-3-33.5-3	345917	5.11	750433	5.55	926207	8.00
11	PAI-9-12.5-1	328247	5.11	725686	5.55	864248	8.00
12	PAI-10-19.5-	325167	5.11	695596	5.55	817646	8.00
13	PAI-10-24.5-	325793	5.10	717146	5.55	830103	8.00
14	PAI-11-9.5-1	319802	5.11	705927	5.55	797679	8.00
15	PAI-11-18.0-	242357	5.11	539708	5.55	646144	8.00
16	PAI-4-16.0-1	343945	5.11	762135	5.55	926302	8.00
17	PAI-3-13.0-1	320448	5.11	742242	5.55	899857	8.00
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP16 | Project: GAS WORKS PARK

Ical Midpoint ID: 0101120 | Ical Date: 11/20/14

Instrument ID: NT5 | Project Run Date: 12/23/14

		IS4 (DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	450241	10.09				
	UPPER LIMIT	900482	10.59				
	LOWER LIMIT	225120	9.59				
	Sample ID						
01	LCS1223	477360	10.08				
02	LCS1223	478264	10.08				
03	MB1223	445627	10.08				
04	TRIP BLANK	482879	10.08				
05	TRIP BLANK	477074	10.08				
06	TRIP BLANKS	482745	10.08				
07	PAI-9-12.5-1	472425	10.08				
08	PAI-10-9.5-1	447111	10.08				
09	PAI-8-14.5-1	437643	10.09				
10	PAI-3-33.5-3	502089	10.09				
11	PAI-9-12.5-1	464100	10.09				
12	PAI-10-19.5-	429299	10.08				
13	PAI-10-24.5-	452451	10.08				
14	PAI-11-9.5-1	420068	10.08				
15	PAI-11-18.0-	344831	10.08				
16	PAI-4-16.0-1	503028	10.08				
17	PAI-3-13.0-1	485522	10.08				
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

SIM PAH Analysis
Report and Summary QC Forms

ARI Job ID: ZP06, ZP11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546

Sample ID: PAI-11-9.5-10
SAMPLE

Lab Sample ID: ZP06A
LIMS ID: 14-27337
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 11:48
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 0.78 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 22.6 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	140	320	30,000 B
208-96-8	Acenaphthylene	100	320	4,600
83-32-9	Acenaphthene	96	320	6,100
86-73-7	Fluorene	94	320	8,600
85-01-8	Phenanthrene	100	320	23,000
120-12-7	Anthracene	110	320	6,200
206-44-0	Fluoranthene	120	320	22,000
129-00-0	Pyrene	140	320	24,000
56-55-3	Benzo(a)anthracene	140	320	8,100
218-01-9	Chrysene	120	320	9,200
205-99-2	Benzo(b)fluoranthene	140	320	6,400
207-08-9	Benzo(k)fluoranthene	150	320	3,400
50-32-8	Benzo(a)pyrene	150	320	8,300
193-39-5	Indeno(1,2,3-cd)pyrene	190	320	4,900
53-70-3	Dibenz(a,h)anthracene	160	320	1,500
191-24-2	Benzo(g,h,i)perylene	180	320	6,600
TOTBFA	Total Benzofluoranthenes	150	320	13,000

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	73.3%
d10-2-Methylnaphthalene	53.3%
d14-Dibenzo(a,h)anthracen	65.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-11-18.0-18.5
SAMPLE

Lab Sample ID: ZP06B
LIMS ID: 14-27338
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/13/15 22:09
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 26.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.2	4.9	490 EB
208-96-8	Acenaphthylene	1.6	4.9	75
83-32-9	Acenaphthene	1.4	4.9	100
86-73-7	Fluorene	1.4	4.9	270
85-01-8	Phenanthrene	1.5	4.9	920 E
120-12-7	Anthracene	1.7	4.9	460
206-44-0	Fluoranthene	1.8	4.9	1,200 ES
129-00-0	Pyrene	2.2	4.9	1,100 ES
56-55-3	Benzo(a)anthracene	2.2	4.9	300
218-01-9	Chrysene	1.9	4.9	390
205-99-2	Benzo(b)fluoranthene	2.1	4.9	210
207-08-9	Benzo(k)fluoranthene	2.2	4.9	110
50-32-8	Benzo(a)pyrene	2.3	4.9	260
193-39-5	Indeno(1,2,3-cd)pyrene	2.9	4.9	170
53-70-3	Dibenz(a,h)anthracene	2.5	4.9	39
191-24-2	Benzo(g,h,i)perylene	2.7	4.9	250
TOTBFA	Total Benzofluoranthenes	2.2	4.9	430

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	59.0%
d10-2-Methylnaphthalene	52.3%
d14-Dibenzo(a,h)anthracen	46.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-11-18.0-18.5
DILUTION

Lab Sample ID: ZP06B
LIMS ID: 14-27338
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 12:13
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 26.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	11	24	530 B
208-96-8	Acenaphthylene	7.8	24	70
83-32-9	Acenaphthene	7.2	24	100
86-73-7	Fluorene	7.1	24	260
85-01-8	Phenanthrene	7.7	24	1,200
120-12-7	Anthracene	8.7	24	500
206-44-0	Fluoranthene	9.1	24	1,600
129-00-0	Pyrene	11	24	1,500
56-55-3	Benzo(a)anthracene	11	24	310
218-01-9	Chrysene	9.3	24	410
205-99-2	Benzo(b)fluoranthene	10	24	210
207-08-9	Benzo(k)fluoranthene	11	24	110
50-32-8	Benzo(a)pyrene	12	24	250
193-39-5	Indeno(1,2,3-cd)pyrene	15	24	150
53-70-3	Dibenz(a,h)anthracene	12	24	32
191-24-2	Benzo(g,h,i)perylene	14	24	240
TOTBFA	Total Benzofluoranthenes	11	24	430

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	60.0%
d10-2-Methylnaphthalene	58.3%
d14-Dibenzo(a,h)anthracen	40.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520

Client ID	FLN	MNP	DBA	TOT OUT
PAI-11-9.5-10	73.3%	53.3%	65.0%	0
MB-122414	74.0%	50.3%	84.3%	0
LCS-122414	70.7%	55.3%	87.7%	0
LCSD-122414	71.7%	54.7%	88.3%	0
PAI-11-18.0-18.5	59.0%	52.3%	46.0%	0
PAI-11-18.0-18.5 DL	60.0%	58.3%	40.0%	0
PAI-11-18.0-18.5 MS	67.7%	56.3%	54.0%	0
PAI-11-18.0-18.5 MSD	60.7%	54.3%	45.7%	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(36-134)	(36-134)
(MNP) = d10-2-Methylnaphthalene	(32-120)	(32-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(21-133)	(21-133)

Prep Method: SW3546
Log Number Range: 14-27337 to 14-27338

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: PAI-11-18.0-18.5
MATRIX SPIKE

Lab Sample ID: ZP06B
LIMS ID: 14-27338
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
Event: 0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted MS/MSD: 12/24/14

Date Analyzed MS: 01/13/15 22:34
MSD: 01/13/15 23:00
Instrument/Analyst MS: NT8/JZ
MSD: NT8/JZ

Sample Amount MS: 10.29 g-dry-wt
MSD: 10.28 g-dry-wt
Final Extract Volume MS: 0.50 mL
MSD: 0.50 mL
Dilution Factor MS: 1.00
MSD: 1.00

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	490 EB	559 EB	146	47.3%	606 EB	146	79.5%	8.1%
Acenaphthylene	75	161	146	58.9%	149	146	50.7%	7.7%
Acenaphthene	100	182	146	56.2%	175	146	51.4%	3.9%
Fluorene	270	361	146	62.3%	328	146	39.7%	9.6%
Phenanthrene	920 E	941 E	146	NA	924 E	146	NA	1.8%
Anthracene	460	530 E	146	47.9%	482	146	15.1%	9.5%
Fluoranthene	1200 ES	1240 ES	146	NA	1130 ES	146	NA	9.3%
Pyrene	1100 ES	1110 ES	146	NA	1060 ES	146	NA	4.6%
Benzo(a)anthracene	300	399	146	67.8%	413	146	77.4%	3.4%
Chrysene	390	501 E	146	76.0%	501 E	146	76.0%	0.0%
Benzo(b)fluoranthene	210	337	146	87.0%	344	146	91.8%	2.1%
Benzo(k)fluoranthene	110	198	146	60.3%	201	146	62.3%	1.5%
Benzo(a)pyrene	260	370	146	75.3%	398	146	94.5%	7.3%
Indeno(1,2,3-cd)pyrene	170	283	146	77.4%	283	146	77.4%	0.0%
Dibenz(a,h)anthracene	39	124	146	58.2%	115	146	52.1%	7.5%
Benzo(g,h,i)perylene	250	411	146	110%	413	146	112%	0.5%
Total Benzofluoranthenes	430	724	437	67.3%	739	438	70.5%	2.1%

Reported in µg/kg (ppb)

NA-No recovery due to high concentration (> 4X) of analyte in original sample, calculated negative recovery, or undetected spike.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-11-18.0-18.5
MATRIX SPIKE

Lab Sample ID: ZP06B
LIMS ID: 14-27338
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/13/15 22:34
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 26.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.2	4.9	---
208-96-8	Acenaphthylene	1.6	4.9	---
83-32-9	Acenaphthene	1.4	4.9	---
86-73-7	Fluorene	1.4	4.9	---
85-01-8	Phenanthrene	1.5	4.9	---
120-12-7	Anthracene	1.7	4.9	---
206-44-0	Fluoranthene	1.8	4.9	---
129-00-0	Pyrene	2.2	4.9	---
56-55-3	Benzo(a)anthracene	2.2	4.9	---
218-01-9	Chrysene	1.9	4.9	---
205-99-2	Benzo(b)fluoranthene	2.1	4.9	---
207-08-9	Benzo(k)fluoranthene	2.2	4.9	---
50-32-8	Benzo(a)pyrene	2.3	4.9	---
193-39-5	Indeno(1,2,3-cd)pyrene	2.9	4.9	---
53-70-3	Dibenz(a,h)anthracene	2.5	4.9	---
191-24-2	Benzo(g,h,i)perylene	2.7	4.9	---
TOTBFA	Total Benzofluoranthenes	2.2	4.9	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	67.7%
d10-2-Methylnaphthalene	56.3%
d14-Dibenzo(a,h)anthracen	54.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-11-18.0-18.5
MATRIX SPIKE DUP

Lab Sample ID: ZP06B
LIMS ID: 14-27338
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/13/15 23:00
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 26.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.2	4.9	---
208-96-8	Acenaphthylene	1.6	4.9	---
83-32-9	Acenaphthene	1.4	4.9	---
86-73-7	Fluorene	1.4	4.9	---
85-01-8	Phenanthrene	1.5	4.9	---
120-12-7	Anthracene	1.7	4.9	---
206-44-0	Fluoranthene	1.8	4.9	---
129-00-0	Pyrene	2.2	4.9	---
56-55-3	Benzo(a)anthracene	2.2	4.9	---
218-01-9	Chrysene	1.9	4.9	---
205-99-2	Benzo(b)fluoranthene	2.1	4.9	---
207-08-9	Benzo(k)fluoranthene	2.2	4.9	---
50-32-8	Benzo(a)pyrene	2.3	4.9	---
193-39-5	Indeno(1,2,3-cd)pyrene	2.9	4.9	---
53-70-3	Dibenz(a,h)anthracene	2.5	4.9	---
191-24-2	Benzo(g,h,i)perylene	2.7	4.9	---
TOTBFA	Total Benzofluoranthenes	2.2	4.9	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	60.7%
d10-2-Methylnaphthalene	54.3%
d14-Dibenzo(a,h)anthracen	45.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: LCS-122414
LAB CONTROL SAMPLE

Lab Sample ID: LCS-122414
LIMS ID: 14-27338
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted: 12/24/14

Date Analyzed LCS: 01/13/15 20:53
LCSD: 01/13/15 21:18
Instrument/Analyst LCS: NT8/JZ
LCSD: NT8/JZ

Sample Amount LCS: 10.00 g-dry-wt
LCSD: 10.00 g-dry-wt
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	74.7 B	150	49.8%	80.6 B	150	53.7%	7.6%
Acenaphthylene	81.8	150	54.5%	80.5	150	53.7%	1.6%
Acenaphthene	75.8	150	50.5%	80.9	150	53.9%	6.5%
Fluorene	85.6	150	57.1%	94.6	150	63.1%	10.0%
Phenanthrene	94.7	150	63.1%	101	150	67.3%	6.4%
Anthracene	91.8	150	61.2%	94.8	150	63.2%	3.2%
Fluoranthene	101	150	67.3%	108	150	72.0%	6.7%
Pyrene	101	150	67.3%	108	150	72.0%	6.7%
Benzo(a)anthracene	102	150	68.0%	108	150	72.0%	5.7%
Chrysene	99.0	150	66.0%	105	150	70.0%	5.9%
Benzo(b)fluoranthene	109	150	72.7%	115	150	76.7%	5.4%
Benzo(k)fluoranthene	103	150	68.7%	107	150	71.3%	3.8%
Benzo(a)pyrene	100	150	66.7%	103	150	68.7%	3.0%
Indeno(1,2,3-cd)pyrene	116	150	77.3%	119	150	79.3%	2.6%
Dibenz(a,h)anthracene	120	150	80.0%	123	150	82.0%	2.5%
Benzo(g,h,i)perylene	116	150	77.3%	122	150	81.3%	5.0%
Total Benzofluoranthenes	292	450	64.9%	306	450	68.0%	4.7%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-Fluoranthene	70.7%	71.7%
d10-2-Methylnaphthalene	55.3%	54.7%
d14-Dibenzo(a,h)anthracene	87.7%	88.3%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

ZP06MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP06

Project: GAS WORKS PARK-PLAY

Lab File ID: 01141503

Date Extracted: 12/24/14

Instrument ID: NT8

Date Analyzed: 01/14/15

Matrix: SOLID

Time Analyzed: 1123

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	ZP06LCSS1	ZP06LCSS1	01131524	01/13/15
02	ZP06LCSDS1	ZP06LCSDS1	01131525	01/13/15
03	PAI-11-18.0-18.5	ZP06B	01131527	01/13/15
04	PAI-11-18.0-18.	ZP06BMS	01131528	01/13/15
05	PAI-11-18.0-18.	ZP06BMSD	01131529	01/13/15
06	PAI-11-9.5-10	ZP06A	01141504	01/14/15
07	PAI-11-18.0-18.5	ZP06B	01141505	01/14/15
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: MB-122414
METHOD BLANK

Lab Sample ID: MB-122414
LIMS ID: 14-27338
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 11:23
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**2.3**	**5.0**	**3.6 J**
208-96-8	Acenaphthylene	1.6	5.0	< 5.0 U
83-32-9	Acenaphthene	1.5	5.0	< 5.0 U
86-73-7	Fluorene	1.5	5.0	< 5.0 U
85-01-8	Phenanthrene	1.6	5.0	< 5.0 U
120-12-7	Anthracene	1.8	5.0	< 5.0 U
206-44-0	Fluoranthene	1.9	5.0	< 5.0 U
129-00-0	Pyrene	2.3	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	2.2	5.0	< 5.0 U
218-01-9	Chrysene	1.9	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.1	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	2.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.4	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	2.6	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	2.8	5.0	< 5.0 U
TOTBFA	Total Benzofluoranthenes	2.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	74.0%
d10-2-Methylnaphthalene	50.3%
d14-Dibenzo(a,h)anthracen	84.3%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/05/15 DFTPP Injection Time: 1510

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	25.9
68	Less than 2.0% of mass 69	1.0 (1.9)1
69	Mass 69 relative abundance	50.7
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	10.0 - 80.0% of mass 198	51.2
197	Less than 2.0% of mass 198	0.7
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.2
365	Greater than 1.0% of mass 198	4.12
441	0.0 - 24.0% of mass 442	8.7 (14.6)2
442	50.0 - 200.0% of mass 198	59.9
443	15.0 - 24.0% of mass 442	12.1 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC250105	SDA0002-CAL4	01051502	01/05/15	1523
02	IC010105	SDA0002-CAL1	01051503	01/05/15	1548
03	IC050105	SDA0002-CAL2	01051504	01/05/15	1614
04	IC10105	SDA0002-CAL3	01051505	01/05/15	1639
05	IC50105	SDA0002-CAL5	01051506	01/05/15	1704
06	IC100105	SDA0002-CAL6	01051507	01/05/15	1730
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/13/15 DFTPP Injection Time: 1833

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	48.6
70	Less than 2.0% of mass 69	0.3 (0.7)1
127	10.0 - 80.0% of mass 198	48.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.4
365	Greater than 1.0% of mass 198	3.71
441	0.0 - 24.0% of mass 442	9.0 (16.2)2
442	50.0 - 200.0% of mass 198	55.7
443	15.0 - 24.0% of mass 442	12.0 (21.6)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0113	ICV0113	01131519	01/13/15	1846
02	ZP06LCSS1	ZP06LCSS1	01131524	01/13/15	2053
03	ZP06LCSDS1	ZP06LCSDS1	01131525	01/13/15	2118
04	PAI-11-18.0-18.5	ZP06B	01131527	01/13/15	2209
05	PAI-11-18.0-18.	ZP06BMS	01131528	01/13/15	2234
06	PAI-11-18.0-18.	ZP06BMSD	01131529	01/13/15	2300
07					
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FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/14/15 DFTPP Injection Time: 1044

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	17.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	51.9
70	Less than 2.0% of mass 69	0.4 (0.7)1
127	10.0 - 80.0% of mass 198	48.8
197	Less than 2.0% of mass 198	0.3
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.6
275	10.0 - 60.0% of mass 198	31.3
365	Greater than 1.0% of mass 198	3.42
441	0.0 - 24.0% of mass 442	9.3 (15.9)2
442	50.0 - 200.0% of mass 198	58.5
443	15.0 - 24.0% of mass 442	11.7 (20.1)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0114	ICV0114	01141502	01/14/15	1057
02	ZP06MBS1	ZP06MBS1	01141503	01/14/15	1123
03	PAI-11-9.5-10	ZP06A	01141504	01/14/15	1148
04	PAI-11-18.0-18.5	ZP06B	01141505	01/14/15	1213
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6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP06 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Calibration Date: 01/05/15

LAB FILE ID: RRF0.1=01051503 RRF0.5=01051504 RRF1 =01051505
RRF2.5=01051502 RRF5 =01051506 RRF10 =01051507

COMPOUND	RRF 0.1	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	___ RRF	%RSD /R^2
Naphthalene	1.287	1.037	1.113	1.164	1.171	1.130	1.150	7.2
2-Methylnaphthalene	0.696	0.647	0.656	0.676	0.688	0.677	0.673	2.8
1-methylnaphthalene	0.648	0.568	0.601	0.633	0.644	0.635	0.622	5.0
Biphenyl	1.613	1.336	1.461	1.458	1.497	1.427	1.465	6.2
2,6-Dimethylnaphthalene	1.126	0.951	1.049	1.067	1.127	1.098	1.070	6.2
Acenaphthylene	1.781	1.498	1.694	1.772	1.848	1.753	1.724	7.0
Acenaphthene	1.328	1.058	1.140	1.164	1.182	1.155	1.171	7.5
Dibenzofuran	1.794	1.531	1.643	1.636	1.687	1.578	1.645	5.6
1,6,7-Trimethylnaphthalene	1.087	0.974	1.024	1.062	1.129	1.096	1.062	5.2
Fluorene	1.478	1.160	1.297	1.320	1.398	1.346	1.333	8.0
Dibenzothiophene	1.146	1.001	1.029	1.071	1.053	1.020	1.053	4.9
Phenanthrene	1.202	1.023	1.069	1.073	1.102	1.062	1.088	5.6
Anthracene	1.134	0.976	1.061	1.091	1.123	1.086	1.078	5.2
Carbazole	1.020	0.888	0.942	0.986	1.014	0.999	0.975	5.2
1-Methylphenanthrene	0.961	0.774	0.829	0.878	0.898	0.905	0.874	7.4
Fluoranthene	1.538	1.197	1.268	1.293	1.317	1.283	1.316	8.8
Pyrene	1.314	1.129	1.223	1.236	1.274	1.211	1.231	5.1
Benzo(a)anthracene	1.328	1.077	1.193	1.226	1.248	1.237	1.218	6.8
Chrysene	1.289	1.088	1.165	1.181	1.186	1.183	1.182	5.4
Benzo(b)fluoranthene	1.240	1.022	1.046	1.142	1.188	1.158	1.133	7.4
Benzo(k)fluoranthene	1.300	1.045	1.104	1.189	1.210	1.223	1.178	7.7
Benzo(j)fluoranthene	1.335	1.032	1.084	1.162	1.166	1.180	1.160	8.9
Benzo(e)pyrene	1.219	1.047	1.073	1.118	1.136	1.134	1.121	5.3
Benzo(a)pyrene	1.215	0.964	1.069	1.099	1.174	1.172	1.116	8.2
Perylene	1.258	0.999	1.057	1.106	1.163	1.152	1.122	8.0
Indeno(1,2,3-cd)pyrene	1.192	1.112	1.178	1.260	1.329	1.373	1.241	7.9
Dibenzo(a,h)anthracene	0.945	0.909	0.970	1.014	1.138	1.170	1.024	10.4
Benzo(g,h,i)perylene	1.167	0.985	0.981	1.047	1.121	1.136	1.073	7.5
2-Methylnaphthalene-d10	0.784	0.640	0.682	0.694	0.721	0.720	0.707	6.8
Dibenzo(a,h)anthracene-d14	0.826	0.724	0.769	0.814	0.874	0.910	0.820	8.3

<- Outside QC limits: %RSD <20% or R^2 > 0.990

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP06 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Cont. Calib. Date: 01/13/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 1846

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.113	0.700	AVRG	-3.2
2-Methylnaphthalene	0.673	0.702	0.400	AVRG	4.3
Acenaphthylene	1.724	1.772	0.900	AVRG	2.8
Acenaphthene	1.171	1.177	0.900	AVRG	0.5
Dibenzofuran	1.645	1.576	0.800	AVRG	-4.2
Fluorene	1.333	1.339	0.900	AVRG	0.4
Phenanthrene	1.088	1.104	0.700	AVRG	1.5
Anthracene	1.078	1.115	0.700	AVRG	3.4
Fluoranthene	1.316	1.281	0.600	AVRG	-2.6
Pyrene	1.231	1.262	0.600	AVRG	2.5
Benzo(a)anthracene	1.218	1.209	0.800	AVRG	-0.7
Chrysene	1.182	1.148	0.700	AVRG	-2.9
Benzo(b)fluoranthene	1.133	1.166	0.700	AVRG	2.9
Benzo(k)fluoranthene	1.178	1.150	0.700	AVRG	-2.4
Benzo(j)fluoranthene	1.160	1.090	0.010	AVRG	-6.0
Benzo(a)pyrene	1.116	1.099	0.700	AVRG	-1.5
Indeno(1,2,3-cd)pyrene	1.241	1.348	0.500	AVRG	8.6
Dibenzo(a,h)anthracene	1.024	1.134	0.400	AVRG	10.7
Benzo(g,h,i)perylene	1.073	1.166	0.500	AVRG	8.7
1-methylnaphthalene	0.622	0.663	0.010	AVRG	6.6
Perylene	1.122	1.096	0.010	AVRG	-2.3
2-Methylnaphthalene-d10	0.707	0.711	0.010	AVRG	0.6
Dibenzo(a,h)anthracene-d14	0.820	0.959	0.010	AVRG	17.0
Fluoranthene-d10	1.185	1.179	0.010	AVRG	-0.5

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII SV-1

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP06 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT8 Cont. Calib. Date: 01/14/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 1057

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.077	0.700	AVRG	-6.3
2-Methylnaphthalene	0.673	0.697	0.400	AVRG	3.6
Acenaphthylene	1.724	1.820	0.900	AVRG	5.6
Acenaphthene	1.171	1.195	0.900	AVRG	2.0
Dibenzofuran	1.645	1.642	0.800	AVRG	-0.2
Fluorene	1.333	1.370	0.900	AVRG	2.8
Phenanthrene	1.088	1.086	0.700	AVRG	-0.2
Anthracene	1.078	1.099	0.700	AVRG	1.9
Fluoranthene	1.316	1.297	0.600	AVRG	-1.4
Pyrene	1.231	1.231	0.600	AVRG	0.0
Benzo(a)anthracene	1.218	1.210	0.800	AVRG	-0.6
Chrysene	1.182	1.141	0.700	AVRG	-3.5
Benzo(b)fluoranthene	1.133	1.174	0.700	AVRG	3.6
Benzo(k)fluoranthene	1.178	1.196	0.700	AVRG	1.5
Benzo(j)fluoranthene	1.160	1.131	0.010	AVRG	-2.5
Benzo(a)pyrene	1.116	1.106	0.700	AVRG	-0.9
Indeno(1,2,3-cd)pyrene	1.241	1.246	0.500	AVRG	0.4
Dibenzo(a,h)anthracene	1.024	1.045	0.400	AVRG	2.0
Benzo(g,h,i)perylene	1.073	1.077	0.500	AVRG	0.4
1-methylnaphthalene	0.622	0.675	0.010	AVRG	8.5
Perylene	1.122	1.108	0.010	AVRG	-1.2
2-Methylnaphthalene-d10	0.707	0.697	0.010	AVRG	-1.4
Dibenzo(a,h)anthracene-d14	0.820	0.893	0.010	AVRG	8.9
Fluoranthene-d10	1.185	1.194	0.010	AVRG	0.8

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP06 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/13/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	393798	4.60	262932	6.86	448261	8.87
	UPPER LIMIT		5.10		7.36		9.37
	LOWER LIMIT		4.10		6.36		8.37
01	ZP06LCSS1	402831	4.59	270225	6.86	460514	8.87
02	ZP06LCSDS1	388827	4.60	262621	6.86	444839	8.87
03	PAI-11-18.0-	386589	4.60	252089	6.87	447588	8.88
04	PAI-11-18.0-	410772	4.60	268291	6.86	476698	8.88
05	PAI-11-18.0-	402261	4.60	279885	6.86	476379	8.88
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IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP06 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/13/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	482100	13.53	484352	17.30		
	UPPER LIMIT		14.03		17.80		
	LOWER LIMIT		13.03		16.80		
01	ZP06LCSS1	501792	13.53	497942	17.30		
02	ZP06LCSDS1	492133	13.54	483539	17.30		
03	PAI-11-18.0-	518045	13.54	528347	17.31		
04	PAI-11-18.0-	558044	13.55	572970	17.31		
05	PAI-11-18.0-	544410	13.55	565879	17.31		
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IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP06 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/14/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	432716	4.59	285009	6.85	514676	8.85
	UPPER LIMIT		5.09		7.35		9.35
	LOWER LIMIT		4.09		6.35		8.35
01	ZP06MBS1	429175	4.59	282514	6.85	484040	8.86
02	PAI-11-9.5-1	424563	4.59	316797	6.85	489251	8.86
03	PAI-11-18.0-	385317	4.59	271131	6.85	464030	8.86
04							
05							
06							
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23							
24							
25							

IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP06 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/14/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	561143	13.51	529600	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	ZP06MBS1	532275	13.51	460216	17.27		
02	PAI-11-9.5-1	530449	13.51	515449	17.27		
03	PAI-11-18.0-	518642	13.51	487635	17.27		
04							
05							
06							
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16							
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20							
21							
22							
23							
24							
25							

IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-4-16.0-16.5
SAMPLE

Lab Sample ID: ZP11C
LIMS ID: 14-27363
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/15/15 21:19
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 0.90 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 12.2 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	250	560	360,000 ES
208-96-8	Acenaphthylene	180	560	100,000 E
83-32-9	Acenaphthene	170	560	15,000
86-73-7	Fluorene	160	560	98,000 E
85-01-8	Phenanthrene	180	560	190,000 ES
120-12-7	Anthracene	200	560	64,000 E
206-44-0	Fluoranthene	210	560	120,000 ES
129-00-0	Pyrene	250	560	100,000 E
56-55-3	Benzo(a)anthracene	250	560	59,000 E
218-01-9	Chrysene	210	560	71,000 E
205-99-2	Benzo(b)fluoranthene	230	560	33,000
207-08-9	Benzo(k)fluoranthene	250	560	17,000
50-32-8	Benzo(a)pyrene	260	560	30,000
193-39-5	Indeno(1,2,3-cd)pyrene	330	560	18,000
53-70-3	Dibenz(a,h)anthracene	280	560	8,100
191-24-2	Benzo(g,h,i)perylene	310	560	2,700
TOTBFA	Total Benzofluoranthenes	250	560	70,000

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	86.7%
d10-2-Methylnaphthalene	53.3%
d14-Dibenzo(a,h)anthracen	80.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-4-16.0-16.5
DILUTION

Lab Sample ID: ZP11C
LIMS ID: 14-27363
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/19/15 15:36
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 0.90 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 100
Percent Moisture: 12.2 %

CAS Number	Analyte	DL	LOQ	Result	
91-20-3	Naphthalene	2500	5,600	890,000	E
208-96-8	Acenaphthylene	1800	5,600	140,000	
83-32-9	Acenaphthene	1700	5,600	17,000	
86-73-7	Fluorene	1600	5,600	130,000	
85-01-8	Phenanthrene	1800	5,600	400,000	
120-12-7	Anthracene	2000	5,600	85,000	
206-44-0	Fluoranthene	2100	5,600	190,000	
129-00-0	Pyrene	2500	5,600	160,000	
56-55-3	Benzo(a)anthracene	2500	5,600	76,000	
218-01-9	Chrysene	2100	5,600	93,000	
205-99-2	Benzo(b)fluoranthene	2300	5,600	38,000	
207-08-9	Benzo(k)fluoranthene	2500	5,600	22,000	
50-32-8	Benzo(a)pyrene	2600	5,600	36,000	
193-39-5	Indeno(1,2,3-cd)pyrene	3300	5,600	21,000	
53-70-3	Dibenz(a,h)anthracene	2800	5,600	9,200	
191-24-2	Benzo(g,h,i)perylene	3100	5,600	3,400	J
TOTBFA	Total Benzofluoranthenes	2500	5,600	83,000	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-4-16.0-16.5
DILUTION2

Lab Sample ID: ZP11C
LIMS ID: 14-27363
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/19/15 19:47
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 0.90 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 300
Percent Moisture: 12.2 %

CAS Number	Analyte	DL	LOQ	Result	
91-20-3	Naphthalene	7500	17,000	940,000	
208-96-8	Acenaphthylene	5400	17,000	140,000	
83-32-9	Acenaphthene	5000	17,000	17,000	
86-73-7	Fluorene	4900	17,000	130,000	
85-01-8	Phenanthrene	5300	17,000	410,000	
120-12-7	Anthracene	5900	17,000	80,000	
206-44-0	Fluoranthene	6200	17,000	190,000	
129-00-0	Pyrene	7500	17,000	140,000	
56-55-3	Benzo(a)anthracene	7400	17,000	71,000	
218-01-9	Chrysene	6400	17,000	87,000	
205-99-2	Benzo(b)fluoranthene	7000	17,000	37,000	
207-08-9	Benzo(k)fluoranthene	7600	17,000	21,000	
50-32-8	Benzo(a)pyrene	7900	17,000	32,000	
193-39-5	Indeno(1,2,3-cd)pyrene	10000	17,000	20,000	
53-70-3	Dibenz(a,h)anthracene	8500	17,000	8,800	J
191-24-2	Benzo(g,h,i)perylene	9300	17,000	< 17,000	U
TOTBFA	Total Benzofluoranthenes	7600	17,000	82,000	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-3-13.0-13.5
SAMPLE

Lab Sample ID: ZP11D
LIMS ID: 14-27364
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/16/15 11:02
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 0.63 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 39.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	360	790	420,000 ES
208-96-8	Acenaphthylene	260	790	12,000
83-32-9	Acenaphthene	240	790	23,000
86-73-7	Fluorene	230	790	23,000
85-01-8	Phenanthrene	250	790	70,000
120-12-7	Anthracene	280	790	17,000
206-44-0	Fluoranthene	300	790	51,000
129-00-0	Pyrene	360	790	45,000
56-55-3	Benzo(a)anthracene	350	790	19,000
218-01-9	Chrysene	300	790	20,000
205-99-2	Benzo(b)fluoranthene	330	790	14,000
207-08-9	Benzo(k)fluoranthene	360	790	7,800
50-32-8	Benzo(a)pyrene	380	790	12,000
193-39-5	Indeno(1,2,3-cd)pyrene	480	790	7,700
53-70-3	Dibenz(a,h)anthracene	410	790	3,200
191-24-2	Benzo(g,h,i)perylene	440	790	1,600
TOTBFA	Total Benzofluoranthenes	360	790	29,000

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	60.0%
d10-2-Methylnaphthalene	56.7%
d14-Dibenzo(a,h)anthracen	53.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-3-13.0-13.5
DILUTION

Lab Sample ID: ZP11D
LIMS ID: 14-27364
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/19/15 16:01
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 0.63 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 100
Percent Moisture: 39.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**3600**	**7,900**	**920,000 E**
208-96-8	**Acenaphthylene**	**2600**	**7,900**	**15,000**
83-32-9	**Acenaphthene**	**2400**	**7,900**	**25,000**
86-73-7	**Fluorene**	**2300**	**7,900**	**27,000**
85-01-8	**Phenanthrene**	**2500**	**7,900**	**88,000**
120-12-7	**Anthracene**	**2800**	**7,900**	**20,000**
206-44-0	**Fluoranthene**	**3000**	**7,900**	**59,000**
129-00-0	**Pyrene**	**3600**	**7,900**	**52,000**
56-55-3	**Benzo(a)anthracene**	**3500**	**7,900**	**21,000**
218-01-9	**Chrysene**	**3000**	**7,900**	**23,000**
205-99-2	**Benzo(b)fluoranthene**	**3300**	**7,900**	**16,000**
207-08-9	**Benzo(k)fluoranthene**	**3600**	**7,900**	**9,000**
50-32-8	**Benzo(a)pyrene**	**3800**	**7,900**	**14,000**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4800**	**7,900**	**9,500**
53-70-3	Dibenz(a,h)anthracene	4100	7,900	< 7,900 U
191-24-2	Benzo(g,h,i)perylene	4400	7,900	< 7,900 U
TOTBFA	**Total Benzofluoranthenes**	**3600**	**7,900**	**32,000**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-3-13.0-13.5
DILUTION2

Lab Sample ID: ZP11D
LIMS ID: 14-27364
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/19/15 20:12
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 0.63 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 300
Percent Moisture: 39.4 %

CAS Number	Analyte	DL	LOQ	Result	
91-20-3	**Naphthalene**	**11000**	**24,000**	**920,000**	
208-96-8	**Acenaphthylene**	**7700**	**24,000**	**12,000**	**J**
83-32-9	**Acenaphthene**	**7100**	**24,000**	**26,000**	
86-73-7	**Fluorene**	**7000**	**24,000**	**28,000**	
85-01-8	**Phenanthrene**	**7500**	**24,000**	**84,000**	
120-12-7	**Anthracene**	**8500**	**24,000**	**17,000**	**J**
206-44-0	**Fluoranthene**	**8900**	**24,000**	**55,000**	
129-00-0	**Pyrene**	**11000**	**24,000**	**44,000**	
56-55-3	**Benzo(a)anthracene**	**11000**	**24,000**	**19,000**	**J**
218-01-9	**Chrysene**	**9100**	**24,000**	**21,000**	**J**
205-99-2	**Benzo(b)fluoranthene**	**10000**	**24,000**	**15,000**	**J**
207-08-9	Benzo(k)fluoranthene	11000	24,000	< 24,000	U
50-32-8	**Benzo(a)pyrene**	**11000**	**24,000**	**15,000**	**J**
193-39-5	Indeno(1,2,3-cd)pyrene	14000	24,000	< 24,000	U
53-70-3	Dibenz(a,h)anthracene	12000	24,000	< 24,000	U
191-24-2	Benzo(g,h,i)perylene	13000	24,000	< 24,000	U
TOTBFA	**Total Benzofluoranthenes**	**11000**	**24,000**	**31,000**	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-3-33.5-34.0
SAMPLE

Lab Sample ID: ZP11G
LIMS ID: 14-27367
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/19/15 16:26
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00
Percent Moisture: 13.5 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	6.5	14	1,800 E
208-96-8	Acenaphthylene	4.6	14	25
83-32-9	Acenaphthene	4.3	14	58
86-73-7	Fluorene	4.2	14	36
85-01-8	Phenanthrene	4.6	14	94
120-12-7	Anthracene	5.1	14	13 J
206-44-0	Fluoranthene	5.4	14	39
129-00-0	Pyrene	6.5	14	110
56-55-3	Benzo(a)anthracene	6.4	14	14 J
218-01-9	Chrysene	5.5	14	22
205-99-2	Benzo(b)fluoranthene	6.1	14	15
207-08-9	Benzo(k)fluoranthene	6.6	14	8.6 J
50-32-8	Benzo(a)pyrene	6.9	14	47
193-39-5	Indeno(1,2,3-cd)pyrene	8.7	14	26
53-70-3	Dibenz(a,h)anthracene	7.4	14	< 14 U
191-24-2	Benzo(g,h,i)perylene	8.0	14	11 J
TOTBFA	Total Benzofluoranthenes	6.6	14	36

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	63.0%
d10-2-Methylnaphthalene	38.0%
d14-Dibenzo(a,h)anthracen	67.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-3-33.5-34.0
DILUTION

Lab Sample ID: ZP11G
LIMS ID: 14-27367
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/16/15 11:27
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 13.5 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**22**	**48**	**1,900**
208-96-8	Acenaphthylene	15	48	< 48 U
83-32-9	**Acenaphthene**	**14**	**48**	**56**
86-73-7	**Fluorene**	**14**	**48**	**32 J**
85-01-8	**Phenanthrene**	**15**	**48**	**86**
120-12-7	Anthracene	17	48	< 48 U
206-44-0	**Fluoranthene**	**18**	**48**	**38 J**
129-00-0	**Pyrene**	**22**	**48**	**110**
56-55-3	Benzo(a)anthracene	21	48	< 48 U
218-01-9	Chrysene	18	48	< 48 U
205-99-2	Benzo(b)fluoranthene	20	48	< 48 U
207-08-9	Benzo(k)fluoranthene	22	48	< 48 U
50-32-8	**Benzo(a)pyrene**	**23**	**48**	**43 J**
193-39-5	Indeno(1,2,3-cd)pyrene	29	48	< 48 U
53-70-3	Dibenz(a,h)anthracene	25	48	< 48 U
191-24-2	Benzo(g,h,i)perylene	27	48	< 48 U
TOTBFA	Total Benzofluoranthenes	22	48	< 48 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	56.7%
d10-2-Methylnaphthalene	40.0%
d14-Dibenzo(a,h)anthracen	56.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546

Sample ID: PAI-8-14.5-15.0
SAMPLE

Lab Sample ID: ZP11I
LIMS ID: 14-27369
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/19/15 16:51
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00
Percent Moisture: 7.5 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**6.6**	**15**	**670**
208-96-8	**Acenaphthylene**	**4.7**	**15**	**81**
83-32-9	**Acenaphthene**	**4.4**	**15**	**35**
86-73-7	**Fluorene**	**4.3**	**15**	**110**
85-01-8	**Phenanthrene**	**4.6**	**15**	**450**
120-12-7	**Anthracene**	**5.2**	**15**	**110**
206-44-0	**Fluoranthene**	**5.5**	**15**	**230**
129-00-0	**Pyrene**	**6.6**	**15**	**150**
56-55-3	**Benzo(a)anthracene**	**6.5**	**15**	**72**
218-01-9	**Chrysene**	**5.6**	**15**	**71**
205-99-2	**Benzo(b)fluoranthene**	**6.2**	**15**	**37**
207-08-9	**Benzo(k)fluoranthene**	**6.7**	**15**	**23**
50-32-8	**Benzo(a)pyrene**	**7.0**	**15**	**28**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**8.8**	**15**	**17**
53-70-3	Dibenz(a,h)anthracene	7.5	15	< 15 U
191-24-2	Benzo(g,h,i)perylene	8.2	15	< 15 U
TOTBFA	**Total Benzofluoranthenes**	**6.7**	**15**	**79**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	65.0%
d10-2-Methylnaphthalene	44.0%
d14-Dibenzo(a,h)anthracen	73.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520

Client ID	FLN	MNP	DBA	TOT OUT
PAI-4-16.0-16.5	86.7%	53.3%	80.0%	0
PAI-4-16.0-16.5 DL	D D	D D	D D	0
PAI-4-16.0-16.5 DL2	D D	D D	D D	0
PAI-3-13.0-13.5	60.0%	56.7%	53.3%	0
PAI-3-13.0-13.5 DL	D D	D D	D D	0
PAI-3-13.0-13.5 DL2	D D	D D	D D	0
PAI-3-33.5-34.0	63.0%	38.0%	67.0%	0
PAI-3-33.5-34.0 DL	56.7%	40.0%	56.7%	0
MB-010815	59.0%	42.7%	67.7%	0
LCS-010815	69.0%	42.0%	83.7%	0
LCSD-010815	69.7%	42.7%	80.0%	0
PAI-8-14.5-15.0	65.0%	44.0%	73.0%	0
PAI-8-14.5-15.0 MS	46.7%	33.3%	46.7%	0
PAI-8-14.5-15.0 MSD	56.7%	36.7%	53.3%	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(36-134)	(36-134)
(MNP) = d10-2-Methylnaphthalene	(32-120)	(32-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(21-133)	(21-133)

Prep Method: SW3546
Log Number Range: 14-27363 to 14-27369

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PAI-8-14.5-15.0
MATRIX SPIKE

Lab Sample ID: ZP11I
LIMS ID: 14-27369
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
Event: 0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted MS/MSD: 01/08/15

Date Analyzed MS: 01/16/15 12:17
MSD: 01/16/15 12:42
Instrument/Analyst MS: NT8/JZ
MSD: NT8/JZ

Sample Amount MS: 10.24 g-dry-wt
MSD: 10.21 g-dry-wt
Final Extract Volume MS: 0.50 mL
MSD: 0.50 mL
Dilution Factor MS: 10.0
MSD: 10.0

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	670	566	146	NA	579	147	NA	2.3%
Acenaphthylene	81	109	146	19.2%	130	147	33.3%	17.6%
Acenaphthene	35	72.3	146	25.5%	84.2	147	33.5%	15.2%
Fluorene	110	140	146	20.5%	154	147	29.9%	9.5%
Phenanthrene	450	450	146	0.0%	508	147	39.5%	12.1%
Anthracene	110	146	146	24.7%	170	147	40.8%	15.2%
Fluoranthene	230	261	146	21.2%	308	147	53.1%	16.5%
Pyrene	150	155	146	3.4%	201	147	34.7%	25.8%
Benzo(a)anthracene	72	118	146	31.5%	150	147	53.1%	23.9%
Chrysene	71	108	146	25.3%	146	147	51.0%	29.9%
Benzo(b)fluoranthene	37	80.6	146	29.9%	112	147	51.0%	32.6%
Benzo(k)fluoranthene	23	74.7	146	35.4%	91.1	147	46.3%	19.8%
Benzo(a)pyrene	28	43.9 J	146	10.9%	52.9	147	16.9%	18.6%
Indeno(1,2,3-cd)pyrene	17	46.9 J	146	20.5%	63.2	147	31.4%	29.6%
Dibenz(a,h)anthracene	< 15 U	66.4	146	45.5%	75.9	147	51.6%	13.4%
Benzo(g,h,i)perylene	< 15 U	< 48.8 U	146	NA	< 49.0 U	147	NA	NA
Total Benzofluoranthenes	79	209	439	29.6%	273	441	44.0%	26.6%

Reported in µg/kg (ppb)

NA-No recovery due to high concentration (> 4X) of analyte in original sample, calculated negative recovery, or undetected spike.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS **Sample ID: PAI-8-14.5-15.0**
Extraction Method: SW3546 **MATRIX SPIKE**

Lab Sample ID: ZP11I
LIMS ID: 14-27369
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/16/15 12:17
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 7.5 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	22	49	---
208-96-8	Acenaphthylene	16	49	---
83-32-9	Acenaphthene	15	49	---
86-73-7	Fluorene	14	49	---
85-01-8	Phenanthrene	15	49	---
120-12-7	Anthracene	17	49	---
206-44-0	Fluoranthene	18	49	---
129-00-0	Pyrene	22	49	---
56-55-3	Benzo(a)anthracene	22	49	---
218-01-9	Chrysene	19	49	---
205-99-2	Benzo(b)fluoranthene	21	49	---
207-08-9	Benzo(k)fluoranthene	22	49	---
50-32-8	Benzo(a)pyrene	23	49	---
193-39-5	Indeno(1,2,3-cd)pyrene	29	49	---
53-70-3	Dibenz(a,h)anthracene	25	49	---
191-24-2	Benzo(g,h,i)perylene	27	49	---
TOTBFA	Total Benzofluoranthenes	22	49	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	46.7%
d10-2-Methylnaphthalene	33.3%
d14-Dibenzo(a,h)anthracen	46.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-8-14.5-15.0
MATRIX SPIKE DUP

Lab Sample ID: ZP11I
LIMS ID: 14-27369
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Date Extracted: 01/08/15
Date Analyzed: 01/16/15 12:42
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 7.5 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	22	49	---
208-96-8	Acenaphthylene	16	49	---
83-32-9	Acenaphthene	15	49	---
86-73-7	Fluorene	14	49	---
85-01-8	Phenanthrene	15	49	---
120-12-7	Anthracene	17	49	---
206-44-0	Fluoranthene	18	49	---
129-00-0	Pyrene	22	49	---
56-55-3	Benzo(a)anthracene	22	49	---
218-01-9	Chrysene	19	49	---
205-99-2	Benzo(b)fluoranthene	21	49	---
207-08-9	Benzo(k)fluoranthene	22	49	---
50-32-8	Benzo(a)pyrene	23	49	---
193-39-5	Indeno(1,2,3-cd)pyrene	29	49	---
53-70-3	Dibenz(a,h)anthracene	25	49	---
191-24-2	Benzo(g,h,i)perylene	27	49	---
TOTBFA	Total Benzofluoranthenes	22	49	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	56.7%
d10-2-Methylnaphthalene	36.7%
d14-Dibenzo(a,h)anthracen	53.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-010815
LAB CONTROL SAMPLE

Lab Sample ID: LCS-010815
LIMS ID: 14-27369
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted: 01/08/15

Date Analyzed LCS: 01/19/15 17:16
LCSD: 01/19/15 17:41
Instrument/Analyst LCS: NT8/JZ
LCSD: NT8/JZ

Sample Amount LCS: 10.00 g-dry-wt
LCSD: 10.00 g-dry-wt
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	60.5	150	40.3%	62.6	150	41.7%	3.4%
Acenaphthylene	65.4	150	43.6%	68.1	150	45.4%	4.0%
Acenaphthene	63.1	150	42.1%	65.6	150	43.7%	3.9%
Fluorene	78.2	150	52.1%	80.7	150	53.8%	3.1%
Phenanthrene	82.4	150	54.9%	88.5	150	59.0%	7.1%
Anthracene	79.4	150	52.9%	83.8	150	55.9%	5.4%
Fluoranthene	97.0	150	64.7%	104	150	69.3%	7.0%
Pyrene	63.4	150	42.3%	70.2	150	46.8%	10.2%
Benzo(a)anthracene	103	150	68.7%	107	150	71.3%	3.8%
Chrysene	95.4	150	63.6%	98.8	150	65.9%	3.5%
Benzo(b)fluoranthene	98.9	150	65.9%	104	150	69.3%	5.0%
Benzo(k)fluoranthene	97.2	150	64.8%	103	150	68.7%	5.8%
Benzo(a)pyrene	40.8	150	27.2%	41.2	150	27.5%	1.0%
Indeno(1,2,3-cd)pyrene	63.4	150	42.3%	68.0	150	45.3%	7.0%
Dibenz(a,h)anthracene	111	150	74.0%	111	150	74.0%	0.0%
Benzo(g,h,i)perylene	6.6	150	4.4%	6.8	150	4.5%	3.0%
Total Benzofluoranthenes	263	450	58.4%	279	450	62.0%	5.9%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-Fluoranthene	69.0%	69.7%
d10-2-Methylnaphthalene	42.0%	42.7%
d14-Dibenzo(a,h)anthracene	83.7%	80.0%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

ZP11MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP11

Project: GAS WORKS PARK-PLAY

Lab File ID: 01161503

Date Extracted: 01/08/15

Instrument ID: NT8

Date Analyzed: 01/16/15

Matrix: SOLID

Time Analyzed: 0921

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	PAI-4-16.0-16.5	ZP11C	01151529	01/15/15
02	PAI-3-13.0-13.5	ZP11D	01161507	01/16/15
03	PAI-3-33.5-34.0	ZP11G	01161508	01/16/15
04	PAI-8-14.5-15.0	ZP11IMS	01161510	01/16/15
05	PAI-8-14.5-15.0	ZP11IMSD	01161511	01/16/15
06	PAI-4-16.0-16.5	ZP11C	01191516	01/19/15
07	PAI-3-13.0-13.5	ZP11D	01191517	01/19/15
08	PAI-3-33.5-34.0	ZP11G	01191518	01/19/15
09	PAI-8-14.5-15.0	ZP11I	01191519	01/19/15
10	ZP11LCSS1	ZP11LCSS1	01191520	01/19/15
11	ZP11LCSDS1	ZP11LCSDS1	01191521	01/19/15
12	PAI-4-16.0-16.5	ZP11C	01191525	01/19/15
13	PAI-3-13.0-13.5	ZP11D	01191526	01/19/15
14				
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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: MB-010815
METHOD BLANK

Lab Sample ID: MB-010815
LIMS ID: 14-27369
Matrix: Soil
Data Release Authorized:
Reported: 01/20/15

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted: 01/08/15
Date Analyzed: 01/16/15 09:21
Instrument/Analyst: NT8/JZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.3	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.6	5.0	< 5.0 U
83-32-9	Acenaphthene	1.5	5.0	< 5.0 U
86-73-7	Fluorene	1.5	5.0	< 5.0 U
85-01-8	Phenanthrene	1.6	5.0	< 5.0 U
120-12-7	Anthracene	1.8	5.0	< 5.0 U
206-44-0	Fluoranthene	1.9	5.0	< 5.0 U
129-00-0	Pyrene	2.3	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	2.2	5.0	< 5.0 U
218-01-9	Chrysene	1.9	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.1	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	2.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.4	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	2.6	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	2.8	5.0	< 5.0 U
TOTBFA	Total Benzofluoranthenes	2.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	59.0%
d10-2-Methylnaphthalene	42.7%
d14-Dibenzo(a,h)anthracen	67.7%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/05/15 DFTPP Injection Time: 1510

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	25.9
68	Less than 2.0% of mass 69	1.0 (1.9)1
69	Mass 69 relative abundance	50.7
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	10.0 - 80.0% of mass 198	51.2
197	Less than 2.0% of mass 198	0.7
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.2
365	Greater than 1.0% of mass 198	4.12
441	0.0 - 24.0% of mass 442	8.7 (14.6)2
442	50.0 - 200.0% of mass 198	59.9
443	15.0 - 24.0% of mass 442	12.1 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC250105	SDA0002-CAL4	01051502	01/05/15	1523
02	IC010105	SDA0002-CAL1	01051503	01/05/15	1548
03	IC050105	SDA0002-CAL2	01051504	01/05/15	1614
04	IC10105	SDA0002-CAL3	01051505	01/05/15	1639
05	IC50105	SDA0002-CAL5	01051506	01/05/15	1704
06	IC100105	SDA0002-CAL6	01051507	01/05/15	1730
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/15/15 DFTPP Injection Time: 0943

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.1 (0.2)1
69	Mass 69 relative abundance	53.4
70	Less than 2.0% of mass 69	0.4 (0.7)1
127	10.0 - 80.0% of mass 198	49.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	32.6
365	Greater than 1.0% of mass 198	4.13
441	0.0 - 24.0% of mass 442	9.9 (15.8)2
442	50.0 - 200.0% of mass 198	62.6
443	15.0 - 24.0% of mass 442	12.8 (20.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0115	ICV0115	01151502	01/15/15	0956
02	PAI-4-16.0-16.5	ZP11C	01151529	01/15/15	2119
03					
04					
05					
06					
07					
08					
09					
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22					

FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/16/15 DFTPP Injection Time: 0843

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	53.6
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	10.0 - 80.0% of mass 198	49.8
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.6
275	10.0 - 60.0% of mass 198	32.5
365	Greater than 1.0% of mass 198	3.95
441	0.0 - 24.0% of mass 442	9.7 (15.5)2
442	50.0 - 200.0% of mass 198	62.5
443	15.0 - 24.0% of mass 442	12.7 (20.3)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0116	ICV0116	01161502	01/16/15	0856
02	ZP11MBS1	ZP11MBS1	01161503	01/16/15	0921
03	PAI-3-13.0-13.5	ZP11D	01161507	01/16/15	1102
04	PAI-3-33.5-34.0	ZP11G	01161508	01/16/15	1127
05	PAI-8-14.5-15.0	ZP11IMS	01161510	01/16/15	1217
06	PAI-8-14.5-15.0	ZP11IMSD	01161511	01/16/15	1242
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08					
09					
10					
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12					
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16					
17					
18					
19					
20					
21					
22					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/19/15 DFTPP Injection Time: 0932

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	19.0
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	54.3
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	10.0 - 80.0% of mass 198	51.0
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	8.1
275	10.0 - 60.0% of mass 198	33.1
365	Greater than 1.0% of mass 198	3.95
441	0.0 - 24.0% of mass 442	11.1 (16.2)2
442	50.0 - 200.0% of mass 198	68.5
443	15.0 - 24.0% of mass 442	13.9 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		ICV0119	01191502	01/19/15	0945
02	PAI-4-16.0-16.5	ZP11C	01191516	01/19/15	1536
03	PAI-3-13.0-13.5	ZP11D	01191517	01/19/15	1601
04	PAI-3-33.5-34.0	ZP11G	01191518	01/19/15	1626
05	PAI-8-14.5-15.0	ZP11I	01191519	01/19/15	1651
06	ZP11LCSS1	ZP11LCSS1	01191520	01/19/15	1716
07	ZP11LCSDS1	ZP11LCSDS1	01191521	01/19/15	1741
08					
09					
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18					
19					
20					
21					
22					

FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/19/15 DFTPP Injection Time: 1844

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	19.2
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	52.8
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	10.0 - 80.0% of mass 198	50.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	31.8
365	Greater than 1.0% of mass 198	3.51
441	0.0 - 24.0% of mass 442	10.1 (16.6)2
442	50.0 - 200.0% of mass 198	61.0
443	15.0 - 24.0% of mass 442	13.1 (21.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0119A	ICV0119A	01191523	01/19/15	1857
02	PAI-4-16.0-16.5	ZP11C	01191525	01/19/15	1947
03	PAI-3-13.0-13.5	ZP11D	01191526	01/19/15	2012
04					
05					
06					
07					
08					
09					
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19					
20					
21					
22					

FORM V SV

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Calibration Date: 01/05/15

LAB FILE ID: RRF0.1=01051503 RRF0.5=01051504 RRF1 =01051505
RRF2.5=01051502 RRF5 =01051506 RRF10 =01051507

COMPOUND	RRF 0.1	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	$\overline{RRF}$	%RSD /R^2
Naphthalene	1.287	1.037	1.113	1.164	1.171	1.130	1.150	7.2
2-Methylnaphthalene	0.696	0.647	0.656	0.676	0.688	0.677	0.673	2.8
1-methylnaphthalene	0.648	0.568	0.601	0.633	0.644	0.635	0.622	5.0
Biphenyl	1.613	1.336	1.461	1.458	1.497	1.427	1.465	6.2
2,6-Dimethylnaphthalene	1.126	0.951	1.049	1.067	1.127	1.098	1.070	6.2
Acenaphthylene	1.781	1.498	1.694	1.772	1.848	1.753	1.724	7.0
Acenaphthene	1.328	1.058	1.140	1.164	1.182	1.155	1.171	7.5
Dibenzofuran	1.794	1.531	1.643	1.636	1.687	1.578	1.645	5.6
1,6,7-Trimethylnaphthalene	1.087	0.974	1.024	1.062	1.129	1.096	1.062	5.2
Fluorene	1.478	1.160	1.297	1.320	1.398	1.346	1.333	8.0
Dibenzothiophene	1.146	1.001	1.029	1.071	1.053	1.020	1.053	4.9
Phenanthrene	1.202	1.023	1.069	1.073	1.102	1.062	1.088	5.6
Anthracene	1.134	0.976	1.061	1.091	1.123	1.086	1.078	5.2
Carbazole	1.020	0.888	0.942	0.986	1.014	0.999	0.975	5.2
1-Methylphenanthrene	0.961	0.774	0.829	0.878	0.898	0.905	0.874	7.4
Fluoranthene	1.538	1.197	1.268	1.293	1.317	1.283	1.316	8.8
Pyrene	1.314	1.129	1.223	1.236	1.274	1.211	1.231	5.1
Benzo(a)anthracene	1.328	1.077	1.193	1.226	1.248	1.237	1.218	6.8
Chrysene	1.289	1.088	1.165	1.181	1.186	1.183	1.182	5.4
Benzo(b)fluoranthene	1.240	1.022	1.046	1.142	1.188	1.158	1.133	7.4
Benzo(k)fluoranthene	1.300	1.045	1.104	1.189	1.210	1.223	1.178	7.7
Benzo(j)fluoranthene	1.335	1.032	1.084	1.162	1.166	1.180	1.160	8.9
Benzo(e)pyrene	1.219	1.047	1.073	1.118	1.136	1.134	1.121	5.3
Benzo(a)pyrene	1.215	0.964	1.069	1.099	1.174	1.172	1.116	8.2
Perylene	1.258	0.999	1.057	1.106	1.163	1.152	1.122	8.0
Indeno(1,2,3-cd)pyrene	1.192	1.112	1.178	1.260	1.329	1.373	1.241	7.9
Dibenzo(a,h)anthracene	0.945	0.909	0.970	1.014	1.138	1.170	1.024	10.4
Benzo(g,h,i)perylene	1.167	0.985	0.981	1.047	1.121	1.136	1.073	7.5
2-Methylnaphthalene-d10	0.784	0.640	0.682	0.694	0.721	0.720	0.707	6.8
Dibenzo(a,h)anthracene-d14	0.826	0.724	0.769	0.814	0.874	0.910	0.820	8.3

<- Outside QC limits: %RSD <20% or R^2 > 0.990

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Cont. Calib. Date: 01/15/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 0956

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.107	0.700	AVRG	-3.7
2-Methylnaphthalene	0.673	0.686	0.400	AVRG	1.9
Acenaphthylene	1.724	1.794	0.900	AVRG	4.1
Acenaphthene	1.171	1.195	0.900	AVRG	2.0
Dibenzofuran	1.645	1.657	0.800	AVRG	0.7
Fluorene	1.333	1.358	0.900	AVRG	1.9
Phenanthrene	1.088	1.092	0.700	AVRG	0.4
Anthracene	1.078	1.077	0.700	AVRG	-0.1
Fluoranthene	1.316	1.318	0.600	AVRG	0.2
Pyrene	1.231	1.257	0.600	AVRG	2.1
Benzo(a)anthracene	1.218	1.211	0.800	AVRG	-0.6
Chrysene	1.182	1.158	0.700	AVRG	-2.0
Benzo(b)fluoranthene	1.133	1.153	0.700	AVRG	1.8
Benzo(k)fluoranthene	1.178	1.200	0.700	AVRG	1.9
Benzo(j)fluoranthene	1.160	1.191	0.010	AVRG	2.7
Benzo(a)pyrene	1.116	1.134	0.700	AVRG	1.6
Indeno(1,2,3-cd)pyrene	1.241	1.262	0.500	AVRG	1.7
Dibenzo(a,h)anthracene	1.024	1.076	0.400	AVRG	5.1
Benzo(g,h,i)perylene	1.073	1.074	0.500	AVRG	0.1
1-methylnaphthalene	0.622	0.658	0.010	AVRG	5.8
Perylene	1.122	1.151	0.010	AVRG	2.6
2-Methylnaphthalene-d10	0.707	0.705	0.010	AVRG	-0.3
Dibenzo(a,h)anthracene-d14	0.820	0.880	0.010	AVRG	7.3
Fluoranthene-d10	1.185	1.193	0.010	AVRG	0.7

<- Exceeds QC limit of 20% D
* RF less than minimum RF

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Cont. Calib. Date: 01/16/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 0856

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.118	0.700	AVRG	-2.8
2-Methylnaphthalene	0.673	0.693	0.400	AVRG	3.0
Acenaphthylene	1.724	1.748	0.900	AVRG	1.4
Acenaphthene	1.171	1.183	0.900	AVRG	1.0
Dibenzofuran	1.645	1.615	0.800	AVRG	-1.8
Fluorene	1.333	1.344	0.900	AVRG	0.8
Phenanthrene	1.088	1.099	0.700	AVRG	1.0
Anthracene	1.078	1.102	0.700	AVRG	2.2
Fluoranthene	1.316	1.349	0.600	AVRG	2.5
Pyrene	1.231	1.229	0.600	AVRG	-0.2
Benzo(a)anthracene	1.218	1.207	0.800	AVRG	-0.9
Chrysene	1.182	1.145	0.700	AVRG	-3.1
Benzo(b)fluoranthene	1.133	1.152	0.700	AVRG	1.7
Benzo(k)fluoranthene	1.178	1.185	0.700	AVRG	0.6
Benzo(j)fluoranthene	1.160	1.153	0.010	AVRG	-0.6
Benzo(a)pyrene	1.116	1.142	0.700	AVRG	2.3
Indeno(1,2,3-cd)pyrene	1.241	1.275	0.500	AVRG	2.7
Dibenzo(a,h)anthracene	1.024	1.042	0.400	AVRG	1.8
Benzo(g,h,i)perylene	1.073	1.099	0.500	AVRG	2.4
1-methylnaphthalene	0.622	0.650	0.010	AVRG	4.5
Perylene	1.122	1.144	0.010	AVRG	2.0
2-Methylnaphthalene-d10	0.707	0.705	0.010	AVRG	-0.3
Dibenzo(a,h)anthracene-d14	0.820	0.878	0.010	AVRG	7.1
Fluoranthene-d10	1.185	1.201	0.010	AVRG	1.4

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII SV-1

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Cont. Calib. Date: 01/19/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 0945

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.098	0.700	AVRG	-4.5
2-Methylnaphthalene	0.673	0.693	0.400	AVRG	3.0
Acenaphthylene	1.724	1.831	0.900	AVRG	6.2
Acenaphthene	1.171	1.185	0.900	AVRG	1.2
Dibenzofuran	1.645	1.618	0.800	AVRG	-1.6
Fluorene	1.333	1.356	0.900	AVRG	1.7
Phenanthrene	1.088	1.103	0.700	AVRG	1.4
Anthracene	1.078	1.108	0.700	AVRG	2.8
Fluoranthene	1.316	1.330	0.600	AVRG	1.1
Pyrene	1.231	1.220	0.600	AVRG	-0.9
Benzo(a)anthracene	1.218	1.194	0.800	AVRG	-2.0
Chrysene	1.182	1.122	0.700	AVRG	-5.1
Benzo(b)fluoranthene	1.133	1.117	0.700	AVRG	-1.4
Benzo(k)fluoranthene	1.178	1.192	0.700	AVRG	1.2
Benzo(j)fluoranthene	1.160	1.113	0.010	AVRG	-4.0
Benzo(a)pyrene	1.116	1.115	0.700	AVRG	-0.1
Indeno(1,2,3-cd)pyrene	1.241	1.283	0.500	AVRG	3.4
Dibenzo(a,h)anthracene	1.024	1.069	0.400	AVRG	4.4
Benzo(g,h,i)perylene	1.073	1.142	0.500	AVRG	6.4
1-methylnaphthalene	0.622	0.636	0.010	AVRG	2.2
Perylene	1.122	1.126	0.010	AVRG	0.4
2-Methylnaphthalene-d10	0.707	0.699	0.010	AVRG	-1.1
Dibenzo(a,h)anthracene-d14	0.820	0.888	0.010	AVRG	8.3
Fluoranthene-d10	1.185	1.220	0.010	AVRG	3.0

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII SV-1

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Instrument ID: NT8 Cont. Calib. Date: 01/19/15

Init. Calib. Date: 01/05/15 Cont. Calib. Time: 1857

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	1.150	1.050	0.700	AVRG	-8.7
2-Methylnaphthalene	0.673	0.705	0.400	AVRG	4.8
Acenaphthylene	1.724	1.827	0.900	AVRG	6.0
Acenaphthene	1.171	1.171	0.900	AVRG	0.0
Dibenzofuran	1.645	1.631	0.800	AVRG	-0.8
Fluorene	1.333	1.358	0.900	AVRG	1.9
Phenanthrene	1.088	1.081	0.700	AVRG	-0.6
Anthracene	1.078	1.098	0.700	AVRG	1.8
Fluoranthene	1.316	1.334	0.600	AVRG	1.4
Pyrene	1.231	1.133	0.600	AVRG	-8.0
Benzo(a)anthracene	1.218	1.164	0.800	AVRG	-4.4
Chrysene	1.182	1.116	0.700	AVRG	-5.6
Benzo(b)fluoranthene	1.133	1.151	0.700	AVRG	1.6
Benzo(k)fluoranthene	1.178	1.165	0.700	AVRG	-1.1
Benzo(j)fluoranthene	1.160	1.111	0.010	AVRG	-4.2
Benzo(a)pyrene	1.116	1.134	0.700	AVRG	1.6
Indeno(1,2,3-cd)pyrene	1.241	1.322	0.500	AVRG	6.5
Dibenzo(a,h)anthracene	1.024	1.106	0.400	AVRG	8.0
Benzo(g,h,i)perylene	1.073	1.133	0.500	AVRG	5.6
1-methylnaphthalene	0.622	0.653	0.010	AVRG	5.0
Perylene	1.122	1.113	0.010	AVRG	-0.8
2-Methylnaphthalene-d10	0.707	0.719	0.010	AVRG	1.7
Dibenzo(a,h)anthracene-d14	0.820	0.936	0.010	AVRG	14.1
Fluoranthene-d10	1.185	1.209	0.010	AVRG	2.0

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/15/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	363073	4.59	238241	6.84	432531	8.85
	UPPER LIMIT		5.09		7.34		9.35
	LOWER LIMIT		4.09		6.34		8.35
01	PAI-4-16.0-1	380166	4.59	245280	6.85	441226	8.86
02							
03							
04							
05							
06							
07							
08							
09							
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13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/15/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	471355	13.51	427266	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	PAI-4-16.0-1	510438	13.51	475240	17.27		
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/16/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	353898	4.58	236153	6.84	418975	8.85
	UPPER LIMIT		5.08		7.34		9.35
	LOWER LIMIT		4.08		6.34		8.35
01	ZP11MBS1	333733	4.58	221194	6.84	398158	8.85
02	PAI-3-13.0-1	428232	4.60	295894	6.85	493760	8.86
03	PAI-3-33.5-3	383633	4.59	252155	6.84	434330	8.85
04	PAI-8-14.5-1	393965	4.59	263397	6.84	458597	8.85
05	PAI-8-14.5-1	400825	4.59	262110	6.85	454881	8.85
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/16/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	468221	13.51	421063	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	ZP11MBS1	443769	13.51	402443	17.27		
02	PAI-3-13.0-1	552572	13.51	528606	17.27		
03	PAI-3-33.5-3	491649	13.51	446300	17.26		
04	PAI-8-14.5-1	524453	13.51	478590	17.26		
05	PAI-8-14.5-1	501392	13.51	463524	17.27		
06							
07							
08							
09							
10							
11							
12							
13							
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IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/19/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	404486	4.59	264564	6.84	462525	8.85
	UPPER LIMIT		5.09		7.34		9.35
	LOWER LIMIT		4.09		6.34		8.35
01	PAI-4-16.0-1	442475	4.59	286200	6.85	495047	8.86
02	PAI-3-13.0-1	425303	4.59	281172	6.85	471435	8.86
03	PAI-3-33.5-3	420869	4.59	267916	6.85	466985	8.86
04	PAI-8-14.5-1	429095	4.58	272435	6.85	479589	8.86
05	ZP11LCSS1	466496	4.58	297535	6.84	538482	8.86
06	ZP11LCSDS1	462684	4.58	302439	6.84	539223	8.86
07							
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IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/19/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	522996	13.51	492706	17.27		
	UPPER LIMIT		14.01		17.77		
	LOWER LIMIT		13.01		16.77		
01	PAI-4-16.0-1	570674	13.52	574675	17.27		
02	PAI-3-13.0-1	530910	13.51	533576	17.27		
03	PAI-3-33.5-3	529376	13.51	527099	17.27		
04	PAI-8-14.5-1	526697	13.52	533609	17.27		
05	ZP11LCSS1	599293	13.51	582494	17.27		
06	ZP11LCSDS1	606889	13.51	590991	17.27		
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IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/19/15

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	387555	4.71	258447	6.97	456948	8.98
	UPPER LIMIT	775110		516894		913896	
	LOWER LIMIT	193778		129224		228474	
	CCAL	462048	4.55	296335	6.81	537194	8.82
	UPPER LIMIT		5.05		7.31		9.32
	LOWER LIMIT		4.05		6.31		8.32
01	PAI-4-16.0-1	412118	4.55	256702	6.81	467519	8.82
02	PAI-3-13.0-1	403531	4.55	265598	6.81	466816	8.82
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IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP11 Project: GAS WORKS PARK-PLAY

Ical Midpoint ID: 01051502 Ical Date: 01/05/15

Instrument ID: NT8 Cont. Cal Date: 01/19/15

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	492500	13.72	485582	17.52		
	UPPER LIMIT	985000		971164			
	LOWER LIMIT	246250		242791			
	CCAL	652608	13.46	652482	17.20		
	UPPER LIMIT		13.96		17.70		
	LOWER LIMIT		12.96		16.70		
01	PAI-4-16.0-1	577331	13.45	597008	17.20		
02	PAI-3-13.0-1	561889	13.45	568355	17.20		
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IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

Metals Analysis
Report and Summary QC Forms

ARI Job ID: ZP06, ZP11

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP06

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
PAI-11-9.5-10	ZP06A	14-27337	
PAI-11-9.5-10D	ZP06ADUP	14-27337	
PAI-11-9.5-10S	ZP06ASPK	14-27337	
PBS	ZP06MB1	14-27337	
LCSS	ZP06MB1SPK	14-27337	
PAI-4-9.5-10.0	ZP11A	14-27361	
PAI-4-13.0-13.5	ZP11B	14-27362	
PAI-4-16.0-16.5	ZP11C	14-27363	
PAI-3-13.0-13.5	ZP11D	14-27364	
PAI-3-15.5-16.0	ZP11E	14-27365	
PAI-3-27.5-28.0	ZP11F	14-27366	
PAI-3-33.5-34.0	ZP11G	14-27367	
PAI-8-8.5-9.0	ZP11H	14-27368	
PAI-8-14.5-15.0	ZP11I	14-27369	
PAI-8-27.5-28.0	ZP11J	14-27370	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 12/30/14 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-11-9.5-10
SAMPLE

Lab Sample ID: ZP06A
LIMS ID: 14-27337
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Percent Total Solids: 63.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	1.7	20	**110**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-4-9.5-10.0
SAMPLE

Lab Sample ID: ZP11A
LIMS ID: 14-27361
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 70.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	1.5	20	**1,430**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-4-13.0-13.5
SAMPLE

Lab Sample ID: ZP11B
LIMS ID: 14-27362
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 67.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.64	7	**181**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-4-16.0-16.5
SAMPLE

Lab Sample ID: ZP11C
LIMS ID: 14-27363
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 80.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.53	6	**26**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-3-13.0-13.5
SAMPLE

Lab Sample ID: ZP11D
LIMS ID: 14-27364
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 61.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	1.8	20	**120**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-3-15.5-16.0
SAMPLE

Lab Sample ID: ZP11E
LIMS ID: 14-27365
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 74.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.61	7	**669**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-3-27.5-28.0
SAMPLE

Lab Sample ID: ZP11F
LIMS ID: 14-27366
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 90.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.47	5	**14**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-3-33.5-34.0
SAMPLE

Lab Sample ID: ZP11G
LIMS ID: 14-27367
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 88.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.49	5	**28**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-8-8.5-9.0
SAMPLE

Lab Sample ID: ZP11H
LIMS ID: 14-27368
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 82.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	1.3	10	**2,150**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-8-14.5-15.0
SAMPLE

Lab Sample ID: ZP11I
LIMS ID: 14-27369
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 88.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.49	5	**41**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-8-27.5-28.0
SAMPLE

Lab Sample ID: ZP11J
LIMS ID: 14-27370
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP11-Geoengineers
Project: Gas Works Park-Play Area Invsetigat
0186-846-01 Task 1520
Date Sampled: 12/10/14
Date Received: 12/11/14

Percent Total Solids: 89.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	**7440-38-2**	**Arsenic**	0.49	5	**8**	

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PAI-11-9.5-10
MATRIX SPIKE

Lab Sample ID: ZP06A
LIMS ID: 14-27337
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010C	110	440	302	109%	

Reported in mg/kg-dry

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PAI-11-9.5-10
DUPLICATE

Lab Sample ID: ZP06A
LIMS ID: 14-27337
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010C	110	120	8.7%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: ZP06LCS
LIMS ID: 14-27337
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010C	217	200	108%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Sample ID: METHOD BLANK

Lab Sample ID: ZP06MB
LIMS ID: 14-27337
Matrix: Soil
Data Release Authorized:
Reported: 12/30/14

QC Report No: ZP06-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	DL	LOQ	mg/kg	Q
3050B	12/23/14	6010C	12/29/14	7440-38-2	Arsenic	0.46	5	5	U

U-Analyte undetected at given DL
J-Analyte detected between DL and LOQ
DL-Method Detection Limit

Results reported below the LOQ are for statistical purposes only and have not been evaluated by either an analyst or data reviewer.

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP06

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	ICP	IP122971	2000.0	2046.13	**102.3**	2000.0	2031.70	**101.6**	2021.54	**101.1**	2098.61	**104.9**	2122.52	**106.1**	2127.04	**106.4**

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP06

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Arsenic	AS	ICP	IP122971	2000.0	2148.74	**107.4**										

Control Limits: Mercury 80-120; Other Metals 90-110

FORM II (1)

ZP06 : 90127

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

UNITS: ug/L

SDG: ZP06

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	ICP	IP122971		50.0	50.05	**100.1**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP06

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	ICP	IP122971	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U

ZP06 : 991139

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP06

UNITS:ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Arsenic	AS	ICP	IP122971	10.0	50.0	50.0	U										

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

ICS SOURCE: I.V.

PROJECT: Gas Works Park-Play

RUNID: IP122971

SDG: ZP06

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	205572.8	211758.7	**105.9**						
Antimony		1000	16.6	1069.0	**106.9**						
Arsenic		1000	18.7	1067.1	**106.7**						
Barium		1000	-3.2	1025.0	**102.5**						
Beryllium		1000	0.1	1017.4	**101.7**						
Boron			-3.6	-4.4							
Cadmium		1000	0.9	1021.4	**102.1**						
Calcium	100000	100000	103567.3	103318.8	**103.3**						
Chromium		1000	-0.5	1033.1	**103.3**						
Cobalt		1000	2.1	970.3	**97.0**						
Copper		1000	0.1	1059.9	**106.0**						
Iron	200000	200000	202170.5	208089.7	**104.0**						
Lead		1000	-11.7	1012.0	**101.2**						
Magnesium	100000	100000	106670.6	105141.9	**105.1**						
Manganese		1000	0.0	968.3	**96.8**						
Molybdenum			3.2	2.9							
Nickel		1000	0.3	1006.1	**100.6**						
Potassium			-18.4	-26.3							
Selenium		1000	32.4	1083.4	**108.3**						
Silicon			1.3	3.0							
Silver		1000	-1.1	1115.0	**111.5**						
Sodium			-68.8	-72.5							
Strontium			3.0	3.0							
Thallium		1000	0.9	971.9	**97.2**						
Tin			-16.9	-20.3							
Titanium			1.3	1.9							
Vanadium		1000	-2.3	990.0	**99.0**						
Zinc		1000	3.5	990.4	**99.0**						

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP06 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Arsenic	AS	ICP	OPTIMA ICP 2	197.20		10	50.0	4/1/2012	30000.0	6/10/2014

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZP06

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	14.0198100	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0764100	0.0000000	-1.0860250	1.6016350	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1911190	0.0000000	0.0000000	0.1532030
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0098370	0.0000000	0.0000000
Boron	249.67	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	2.1785010	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	5.7686950	0.0000000	0.0000000	0.0000000	0.0000000	0.1134910	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0105610	0.0000000	0.0000000	0.0000000	0.0000000	-0.0413720
Cobalt	228.62	0.0000000	0.0000000	0.0853470	0.0000000	0.0000000	0.0000000	0.0000000	-0.0421260	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0021980	0.0000000	-0.1622490	-0.0152760	0.0000000	-0.0447290
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.9508650	0.0000000	0.0000000
Lead	220.35	-0.2096680	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.7516130	1.5325290	0.0499030
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.1119060	0.0000000	-1.6746270	-1.1710960	0.0000000	0.6610200
Manganese	257.61	0.0060150	0.0000000	0.0000000	0.0000000	0.0041750	0.0000000	0.0137770	0.0000000	0.0000000	-0.0046620
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0156160	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5290750	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5634780	0.0000000	-0.5863590	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	6.1573050	0.4310930	0.0000000	-0.1254120
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1475120	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0797880	0.0000000	0.0000000	0.1965610	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.7864850	0.0000000	0.0538250
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

ZP06 - 6014.13

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

IEC DATE: 10/27/2014

SDG: ZP06

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	15.2105350	0.0000000	0.0000000	0.0000000	1.9181250	0.0000000	14.9692830	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.6574750	0.0000000	-4.0497020	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.6569730	0.0000000	0.0000000	0.0000000	-26.2017890	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1112510	0.0000000	0.0000000	0.0000000	0.0000000	0.2137080	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0122940	0.0000000	0.2849470	0.0000000
Boron	249.67	0.0000000	0.0000000	-1.1347080	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9151470	0.0000000	0.0000000	0.0000000	0.0000000	0.0642140	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.1073910	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3457620	0.0000000
Cobalt	228.62	0.0000000	0.0000000	-0.1331780	0.1621790	0.0000000	0.0000000	1.7359160	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0055170	0.0000000	0.3194440	0.0000000	0.0000000	0.0000000	0.1761040	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	7.5009230	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.2575470	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.1944900	0.0000000	0.0000000	0.0000000	-0.0205160	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5357680	0.0000000	0.4509940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.6217450	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2780320	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	:57.1408130	0.0000000	0.0000000	:81.4212140
Thallium	190.80	0.0000000	0.0000000	-1.4387970	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.7649150	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0427690	-0.5371860	-0.2280960	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.9643590	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1516390	-0.4437580	0.0000000	0.0000000	0.0000000	0.5348410	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2610130	0.0000000	-0.0494060	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP06

ANALYSIS METHOD: ICP

ARI PREP CODE: SWC

PREPDATE: 12/23/2014

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
PAI-11-9.5-10	ZP06A	1.038	0.0	50.0
PAI-11-9.5-10D	ZP06ADUP	1.043	0.0	50.0
PAI-11-9.5-10S	ZP06ASPK	1.043	0.0	50.0
PBS	ZP06MB1	1.000	0.0	50.0
LCSS	ZP06MB1SPK	1.000	0.0	50.0
PAI-4-9.5-10.0	ZP11A	1.072	0.0	50.0
PAI-4-13.0-13.5	ZP11B	1.067	0.0	50.0
PAI-4-16.0-16.5	ZP11C	1.078	0.0	50.0
PAI-3-13.0-13.5	ZP11D	1.017	0.0	50.0
PAI-3-15.5-16.0	ZP11E	1.018	0.0	50.0
PAI-3-27.5-28.0	ZP11F	1.078	0.0	50.0
PAI-3-33.5-34.0	ZP11G	1.077	0.0	50.0
PAI-8-8.5-9.0	ZP11H	1.079	0.0	50.0
PAI-8-14.5-15.0	ZP11I	1.055	0.0	50.0
PAI-8-27.5-28.0	ZP11J	1.041	0.0	50.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/29/2014

SDG: ZP06 | RUNID: IP122971 | METHOD: ICP | END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09561				X																										
S2	S2	1.00	10003																														
S3	S3	1.00	10023				X																										
S4	S4	1.00	10050																														
S5	S5	1.00	10072																														
ICV	ICV	1.00	10225				X																										
ICB	ICB	1.00	10270				X																										
CRI	CRII	1.00	10311				X																										
ICSA	ICSAI	1.00	10353				X																										
ICSAB	ICSABI	1.00	10394				X																										
CCV	CCV1	1.00	10452				X																										
CCB	CCB1	1.00	10493				X																										
ZZZZZZ	DICHECK	1.00	10534																														
ZZZZZZ	ZQ14MB2	1.00	10580																														
ZZZZZZ	ZQ14EDUP	1.00	11021																														
ZZZZZZ	ZQ14E	1.00	11063																														
ZZZZZZ	ZQ14ESPK	1.00	11104																														
ZZZZZZ	ZP65B	2.00	11144																														
ZZZZZZ	ZP65H	2.00	11191																														
ZZZZZZ	ZQ14B	2.00	11235																														
ZZZZZZ	ZQ14C	2.00	11275																														
ZZZZZZ	ZQ14MB2SPK	1.00	11315																														
CCV	CCV2	1.00	11355				X																										
CCB	CCB2	1.00	11395				X																										
ZZZZZZ	ZQ14MB1	2.00	11441																														
ZZZZZZ	ZQ14ADUP	2.00	11482																														
ZZZZZZ	ZQ14A	2.00	11523																														
ZZZZZZ	ZQ14ASPK	2.00	11563																														
ZZZZZZ	ZQ14D	2.00	12003																														
PAI-4-9.5-10.0	ZP11A	2.00	12043																														
PAI-4-13.0-13.5	ZP11B	2.00	12090				X																										
PAI-4-16.0-16.5	ZP11C	2.00	12130				X																										
PAI-3-13.0-13.5	ZP11D	2.00	12170																														
ZZZZZZ	ZQ14MB1SPK	2.00	12213																														
CCV	CCV3	1.00	12253				X																										

FORM XIV

ZP06 : 9915

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play

SDG: ZP06

INSTRUMENT ID: OPTIMA ICP 2

RUNID: IP122971 METHOD: ICP

START DATE: 12/29/2014

END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB3	1.00	12293				X																										
PBS	ZP06MB1	2.00	12335																														
PAI-11-9.5-10D	ZP06ADUP	2.00	12383																														
PAI-11-9.5-10	ZP06A	2.00	12425																														
PAI-11-9.5-10S	ZP06ASPK	2.00	12471																														
PAI-3-15.5-16.0	ZP11E	2.00	12513				X																										
PAI-3-27.5-28.0	ZP11F	2.00	12555				X																										
PAI-3-33.5-34.0	ZP11G	2.00	12595				X																										
PAI-8-8.5-9.0	ZP11H	2.00	13040																														
PAI-8-14.5-15.0	ZP11I	2.00	13080				X																										
LCSS	ZP06MB1SPK	2.00	13120				X																										
CCV	CCV4	1.00	13160				X																										
CCB	CCB4	1.00	13201				X																										
PBS	ZP06MB1	2.00	13242				X																										
ZZZZZZ	ZP35MB1	2.00	13284																														
PAI-8-27.5-28.0	ZP11J	2.00	13325				X																										
ZZZZZZ	ZP35C	2.00	13365																														
ZZZZZZ	ZP35ADUP	2.00	13405																														
ZZZZZZ	ZP35A	2.00	13453																														
ZZZZZZ	ZP35ASPK	2.00	13501																														
PAI-4-9.5-10.0	ZP11A	5.00	13544				X																										
PAI-3-13.0-13.5	ZP11D	5.00	13585				X																										
ZZZZZZ	ZP35MB1SPK	2.00	14031																														
CCV	CCV5	1.00	14071				X																										
CCB	CCB5	1.00	14111				X																										
PAI-11-9.5-10D	ZP06ADUP	5.00	14153				X																										
PAI-11-9.5-10	ZP06A	5.00	14195				X																										
PAI-11-9.5-10S	ZP06ASPK	5.00	14240				X																										
PAI-8-8.5-9.0	ZP11H	5.00	14282				X																										
ZZZZZZ	ZP35ADUP	5.00	14322																														
ZZZZZZ	ZP35A	5.00	14365																														
ZZZZZZ	ZP35ASPK	5.00	14412																														
ZZZZZZ	ZP16C	5.00	14454																														
ZZZZZZ	ZP16E	5.00	14500																														
CCV	CCV6	1.00	14542				X																										

FORM XIV

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Geoengineers

PROJECT: Gas Works Park-Play | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 12/29/2014

SDG: ZP06 | RUNID: IP122971 | METHOD: ICP | END DATE: 12/29/2014

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB6	1.00	14582				X																										

Total Solids

ARI Job ID: ZP06, ZP11

Volatiles Total Solids-voats
Data By: Pat Basilio
Created: 12/29/14

Worklist: 6258
Analyst: PAB
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

ARI ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids
1. ZP06A 14-27337	_____	_____	$	77.40
2. ZP06B 14-27338	_____	_____	$	73.30

Worklist ID: 6258 Page: 1
* - VOA TS Copied From BETX TS
% - VOA TS Copied From Metals TS
$ - VOA TS Copied From Extraction TS
$D - VOA TS Copied From Extraction TS/Decanted

Volatiles Total Solids-voats
Data By: Pat Basilio
Created: 12/29/14

Worklist: 6259
Analyst: PAB
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

	ARI ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)		% Solids
1.	ZP11C 14-27363				$	87.80
2.	ZP11D 14-27364				$	60.60
3.	ZP11G 14-27367				$	86.50
4.	ZP11I 14-27369				$	92.50

* - VOA TS Copied From BETX TS
% - VOA TS Copied From Metals TS
$ - VOA TS Copied From Extraction TS
$D - VOA TS Copied From Extraction TS/Decanted

Solids Data Entry Report Checked by: CB Date: 12/23/14
Date: 12/23/14 Data Analyst: DM

Solids Determination performed on 12/22/14 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
ZP06	A	PAI-11-9.5-10	0.997	10.545	7.063	63.53

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Total Solids Bench Sheet

Laboratory Section: Metals

Oven Identification: 07 Balance ID: 068755

Samples in Oven: Date: 12-22-14 Time: 1340 Temp: 105°C Analyst: DM

Removed from Oven: Date: 12-23-14 Time: 0835 Temp: 104°C Analyst: DM

ARI Sample ID		Tare Weight (g)	Tare + Sample Wet (g)	Tare + Sample Dry (g)	Date & Time Last Weight	Final Weighting >12 hrs[1]
ZP14	A	0.974	10.557	9.361	—	✓
"	B	1.029	10.390	9.864	—	✓
"	C	1.043	10.690	10.025	—	✓
"	D	1.049	10.727	10.038	—	✓
ZP96	A	1.011	5.918	1.884	—	✓
ZP35	A	1.042	10.426	6.380	—	✓
"	C	1.013	10.786	9.721	—	✓
ZP16	A	1.019	10.177	8.635	—	✓
"	B	1.010	10.041	8.436	—	✓
"	C	1.002	10.597	6.866	—	✓
"	E	0.979	10.129	6.318	—	✓
"	I	1.012	10.142	8.446	—	✓
ZP06	A	0.997	10.545	7.063	—	✓
ZP11	A	1.049	10.848	7.924	—	✓
"	B	0.989	10.831	7.615	—	✓
"	C	1.019	10.500	8.671	—	✓
"	D	1.022	10.407	6.775	—	✓
"	E	0.981	10.717	8.184	—	✓
"	F	1.068	10.351	9.475	—	✓
"	G	1.052	10.299	9.191	—	✓
"	H	1.012	10.218	8.563	—	✓
"	I	1.058	10.241	9.220	—	✓
"	J	1.022	10.533	9.534	—	✓

1) Place a check mark in this column if samples have dried > 12 but < 24 hours. When samples have been at 104°C < 12 hours, constant weight must be verified as described in SOP 10023S Use a 2nd bench sheet for additional weightings.

Solids Data Entry Report Checked by: CB Date: 12/23/14
Date: 12/23/14 Data Analyst: DM

Solids Determination performed on 12/22/14 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
ZP11	A	PAI-4-9.5-10.0	1.049	10.848	7.924	70.16
ZP11	B	PAI-4-13.0-13.5	0.989	10.831	7.615	67.32
ZP11	C	PAI-4-16.0-16.5	1.019	10.500	8.671	80.71
ZP11	D	PAI-3-13.0-13.5	1.022	10.407	6.775	61.30
ZP11	E	PAI-3-15.5-16.0	0.981	10.717	8.184	73.98
ZP11	F	PAI-3-27.5-28.0	1.068	10.351	9.475	90.56
ZP11	G	PAI-3-33.5-34.0	1.052	10.299	9.191	88.02
ZP11	H	PAI-8-8.5-9.0	1.012	10.218	8.563	82.02
ZP11	I	PAI-8-14.5-15.0	1.058	10.241	9.220	88.88
ZP11	J	PAI-8-27.5-28.0	1.022	10.533	9.534	89.50

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Total Solids Bench Sheet

Laboratory Section: Metals

Oven Identification: 07 Balance ID: 068755

Samples in Oven: Date: 12-22-14 Time: 1340 Temp: 105°C Analyst: DM

Removed from Oven: Date: 12-23-14 Time: 0635 Temp: 104°C Analyst: DM

ARI Sample ID		Tare Weight (g)	Tare + Sample Wet (g)	Tare + Sample Dry (g)	Date & Time Last Weight	Final Weighting >12 hrs[1]
ZP14	A	0.974	10.557	9.361	—	✓
"	B	1.029	10.390	9.864	—	✓
"	C	1.045	10.690	10.025	—	✓
"	D	1.049	10.727	10.038	—	✓
ZP96	A	1.011	5.918	1.884	—	✓
ZP35	A	1.042	10.426	6.580	—	✓
"	C	1.013	10.786	9.721	—	✓
ZP16	A	1.019	10.177	8.635	—	✓
"	B	1.010	10.041	8.436	—	✓
"	C	1.002	10.597	6.866	—	✓
"	E	0.979	10.129	6.318	—	✓
"	I	1.012	10.142	8.446	—	✓
ZP06	A	0.997	10.545	7.063	—	✓
ZP11	A	1.049	10.848	7.924	—	✓
"	B	0.989	10.831	7.615	—	✓
"	C	1.019	10.500	8.671	—	✓
"	D	1.022	10.407	6.775	—	✓
"	E	0.981	10.717	8.184	—	✓
"	F	1.068	10.351	9.475	—	✓
"	G	1.052	10.299	9.191	—	✓
"	H	1.012	10.218	8.563	—	✓
"	I	1.058	10.241	9.220	—	✓
"	J	1.022	10.533	9.534	—	✓

1) Place a check mark in this column if samples have dried > 12 but < 24 hours. When samples have been at 104°C < 12 hours, constant weight must be verified as described in SOP 10023S. Use a 2nd bench sheet for additional weightings.

Extractions Total Solids-extts
Data By: Tarry Hawk
Created: 12/18/14

Worklist: 3095
Analyst: TH
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP06A 14-27337 PAI-11-9.5-10	1.18	9.40	7.54	77.4	No	6.46	12.92	16.15
2.	ZP06B 14-27338 PAI-11-18.0-18.5	1.18	12.20	9.26	73.3	No	6.82	13.64	17.05

Extractions Total Solids-extts
Data By: Tarry Hawk
Created: 12/18/14

Worklist: 3095
Analyst: TH
Comments:

Oven ID: Ø15

Balance ID: B5347059 34

Samples In: Date: 12/19/14 Time: 14:15 Temp: 102 Analyst: TH

Samples Out: Date: 12/21/14 Time: 14:35 Temp: 105 Analyst: TH

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP06A 14-27337 PAI-11-9.5-10	1.18	9.40	7.54		No			
2.	ZP06B 14-27338 PAI-11-18.0-18.5	1.18	12.20	9.26		No			

Extractions Total Solids-extts
Data By: Tarry Hawk
Created: 12/18/14

Worklist: 3096
Analyst: TH
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP11C 14-27363 PAI-4-16.0-16.5	1.18	12.78	11.36	87.8	No	5.69	11.39	14.24
2.	ZP11D 14-27364 PAI-3-13.0-13.5	1.18	9.99	6.52	60.6	No	8.25	16.50	20.63
3.	ZP11G 14-27367 PAI-3-33.5-34.0	1.18	11.69	10.27	86.5	No	5.78	11.56	14.45
4.	ZP11I 14-27369 PAI-8-14.5-15.0	1.17	11.64	10.85	92.5	No	5.41	10.81	13.51

Extractions Total Solids-extts
Data By: Tarry Hawk
Created: 12/18/14

Worklist: 3096
Analyst: TH
Comments:

Oven ID: 015

Balance ID: B3347053934

Samples In: Date: 12/19/14 Time: 14:47 Temp: 102 Analyst: TH

Samples Out: Date: 12/21/14 Time: 13:54 Temp: 96 Analyst: SH

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% TS	Dcnt	5g	10g	12.5g
1.	ZP11C 14-27363 PAI-4-16.0-16.5	1.18	12.78	11.36		No			
2.	ZP11D 14-27364 PAI-3-13.0-13.5	1.18	9.99	6.52		No			
3.	ZP11G 14-27367 PAI-3-33.5-34.0	1.18	11.69	10.27		No			
4.	ZP11I 14-27369 PAI-8-14.5-15.0	1.17	11.64	10.85		No			

Volatile Raw Data
Preparation Log

ARI Job ID: ZP06, ZP11

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VOA Method 5035 Extraction Bench Sheet

(8260C, 8260C-SIM, 8021B, NWTPH-Gx, AK-101, TPH-G, VPH, TCLP-ZHE)

ARI Project No.	Client ID	Prep/Extraction Date	MeOH Lot No.	Analyst
		12/23/14		[illegible]

	Lab ID	Vial No.	Preservative: NaHSO₃	Preservative: CH₃OH	Preservative: Lot #	Vial Weight (g)	Tare (from vial) (g)	Sample Weight (g)	Extract Volume (mL)	MeOH Spilt Volume (µL)	Comments
1	ZP39A	1		✓	DJ239	33.74	28.780		5mL	96ul NT2	
2	B	1		↓	↓	32.17	28.760		↓		[illegible] of MeOH is gone
3	C	1				34.49	28.783			96ul NT2	
4	D	1				34.96	28.717			↓	
5	E	1				35.06	28.983				
6	F	1				32.72	28.915				
7	G	1				32.77	29.043				
8	H	1				31.91	28.705				
9	I	1				35.03	28.815				
10	J	1				33.29	28.771				
11	K	1				33.47	28.832				
12	L	1				31.37	28.985				
13	M	1				35.08	28.533				
14	N	1				35.28	28.723				
15	O	1				35.36	28.699				
16	P	1				34.58	28.826			↓	
17	ZP11C	1				33.30	28.406	4.894		72ul NT2, 10ul NT5	
18	D	1				31.75	28.433	3.317		↓, 10ul NT5	
19	G	1				34.73	28.495	6.235		10ul, 100ul	
20	I	1				34.92	28.726	6.194		, 100ul	
21	ZP16A	1				34.38	28.815	5.565			
22	B	1				33.99	28.586	5.404			
23	C	1		↓	↓	31.40	28.227	3.173	↓	↓	

Balance ID: SLF302 B423665888

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VOA Method 5035 Extraction Bench Sheet

(8260C, 8260C-SIM, 8021B, NWTPH-Gx, AK-101, TPH-G, VPH, TCLP-ZHE)

ARI Project No. | Client ID | Prep/Extraction Date: 12/23/14 | MeOH Lot No. | Analyst: AM

	Lab ID	Vial No.	Preservative			Method 5035 Sample Weight					Comments
			$NaHSO_3$	CH_3OH	Lot #	Vial Weight (g)	Tare (from vial) (g)	Sample Weight (g)	Extract Volume (mL)	MeOH Spilt Volume (µL)	
1	ZPW6 D	1		✓	DJ239	31.49	28.112	3.378	~~10µl~~ 5mL	10µl	
2	E	1			↓	30.77	29.264	1.506	↓	↓	
3	ZPOW A	1				32.73	28.863	3.867	10µl		
4	B	1			↓	34.53	29.135	5.395	↓	↓	
5									AM 12/23/14		
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											

Balance ID: SLF302 B423466888

ZP95 : 95452

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 22, 2015

Zanna Satterwhite
GeoEngineers, Inc.
Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Client Project: Gas Works Park-Play Area Investigation, 0186-846-01 Task 1520
ARI Job Nos.: ZP15 & ZP16

Dear Zanna:

Please find enclosed the Chain of Custody records (COCs), sample receipt documentation, and the final data package for samples from the project referenced above.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this package will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
(206) 695-6214
cheronneo@arilabs.com
www.arilabs.com

cc: eFile: ZP15_ZP16

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: ZP15, ZP16

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: ZP15	Turn-around Requested:
ARI Client Company: GeoEngineers	Phone: 206-239-3231
Client Contact: Zanna Satterwhite	
Client Project Name: Gas Works Park - Play Area Investigation	
Client Project #: 0186-846-01	Samplers: Robert Miyahara / Claudia Delavia

Page: , of	
Date: 12/15/14	Ice Present? Y
No. of Coolers: 2	Cooler Temps: 5.2, 5.6

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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
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Sample ID	Date	Time	Matrix	No Containers	Analysis Requested	Notes/Comments
TRIP BLANK	12/15	—	Water	2		
MW-36D-141215	12/15	1000	Water	14		Ferrous Iron
MW-365-141215	12/15	1130	Water	14		Ferrous Iron

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by: (Signature)
	Printed Name: Hannah McDonagh	Printed Name: D. Volgardsen	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 12/15/14 @ 1350	Date & Time: 12/15/14 1350	Date & Time:	Date & Time:

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

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Cooler Receipt Form

ARI Client. GeoEngineers — Project Name GasWorks Park - PAI

COC No(s): _____ (NA) — Delivered by Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No. ZP15 — Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6 0 °C for chemistry) 5.2 5.6 ___ ___ ___ ___

Time. 1350

If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID# 90877952

Cooler Accepted by: AV Date. 12/15/14 Time: 1350

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ...	Bubble Wrap (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI.	NA	12/1/14	

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by AV Date: 12/16/14 Time: 1350

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

~~TB1 = MW-36S-14~~ TB1 = MW36D-141215 TB2 = MW-36S-141215

TB2 = LLG MW-36D-141215 = 2LG Placed FF Sulfides on hold. All other conv requests are FF.

By: AV Date: 12/16/14

Small Air Bubbles – 2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• •	• • •	● ● ●

Small → "sm"	(< 2 mm)
Peabubbles → "pb"	(2 to < 4 mm)
Large → "lg"	(4 to < 6 mm)
Headspace → "hs"	(> 6 mm)

TOC + DOC requested on COC, no bottles received.

PRESERVATION VERIFICATION 12/16/14
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **ZP15**

Inquiry Number: NONE
Analysis Requested: 12/16/14
Contact: Satterwhite, Zanna
Client: Geoengineers
Logged by: AV
Sample Set Used: Yes-481
Validatable Package: Lv4
Deliverables:

PC: Cheronne
VTSR: 12/15/14

Project #: 0186-846-01 Task 1520
Project: Gas Works Park-Paly Area Investigat
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-27518 **ZP15A**	MW-36D-141215						DIS pos					Fail	** Fail		*	Y	N	S2 / DOC***	12 ***	6N NaOH / 5N H_2SO_4	2ml ~~0.5ml~~	12-16-14 CLZ
14-27519 **ZP15B**	MW-36S-141215						DIS pos					Fail	Fail		*	Y	N	↓	↓	↓	↓	↓

*Lab to determine ferrous iron preservation

** Sulfide preserved with ZnOAC, lab to adjust pH.

12-16-14 alk

*** DOC volume f. I tend then preserved <2.0 pH. Left over unpres. volume preserved <2.0 ph for TOC.

**** DOC vol. preserved w/0.5ml 9N H_2SO_4

TOC vol. preserved w/1ml 9N H_2SO_4

ZP15 : 99999

Checked By AV Date 12/16/14

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: EDS

Turn-around Requested: Standard

Page: 1 of 1

ARI Client Company: GeoEngineers

Phone: 206-239-3221

Date: 12/5/14

Ice Present:

Client Contact:

No. of Coolers:

Cooler Temps:

Client Project Name:

Client Project #:

Analysis Requested

Notes/Comments

Frozen Rush

Frozen Tpa

Comments/Special Instructions:

Use methods specified in guide dated ...

Please analyze ... for sulfide, ... TOS ...

DAS revisions 12/16/14

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4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
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Limits of Liability: ...

Sample Retention Policy: ...

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:	Page: 1 of 2	
ARI Client Company: GeoEngineers	Phone: 206-239-3231	Date: 12/11/14	Ice Present?
Client Contact: Zanna Satterwhite		No. of Coolers:	Cooler Temps:
Client Project Name: Gas Works Park - Play Area Investigation			
Client Project #: 0186-846-01	Samplers: Robert Mayhew + Claudia DeLaVia		

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Tukwila, WA 98168
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Sample ID	Date	Time	Matrix	No Containers	Analysis Requested	Notes/Comments
PAI-9-3-3.5	12/11	0850	Soil	6		
PAI-9-9.5-10.0	12/11	0910	Soil	6		
PAI-9-11.5-12.0	12/11	0920	Soil	6		
PAI-9-12.5-13.0	12/11	0930	Soil	6		
PAI-9-12.5-13-DUP	12/11	0930	Soil	6		
PAI-9-17.5-18.0	12/11	0945	Soil	6		
RINSATE-141211	12/11	1010	Water	3		
PAI-10-9.5-10.0	12/11	1145	Soil	6		
PAI-10-14.5-15.0	12/11	1150	Soil	6		
PAI-10-19.5-20.0	12/11	1210	Soil	6		

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: Claudia DeLaVia	Printed Name: A. Volgardsen	Printed Name	Printed Name
	Company: GeoEngineers	Company: ARI	Company	Company
	Date & Time: 12/11/14 1525	Date & Time: 12/11/14 1525	Date & Time	Date & Time

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:
ARI Client Company: Geo Engineers	Phone: 206-239-3231
Client Contact: Zanna Satterwhite	
Client Project Name: Gas Works Park - Play Area Investigation	
Client Project #: 0186-846-01	Samplers: Robert Miyahrat Claudia De La Vía

Page: 2 of 2

Date: 12/11/14 | Ice Present?

No. of Coolers: | Cooler Temps:

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Sample ID	Date	Time	Matrix	No Containers	Analysis Requested	Notes/Comments
PAI-10-24.5-25.0	12/11	1215	Soil	6		
PAI-10-29.5-30.0	12/11	1220	Soil	6		
PAI-10-31.5-32.0	12/11	1230	Soil	3		Dry ice core
PAI-11-12.0-12.5	12/11	1350	Soil	3		Black is bottom of core
PAI-11-18.5-19.0	12/11	1400	Soil	3		↓
PAI-11-28.0-28.5	12/11	1430	Soil	3		
PAI-11-22-22.5	12/11	1420	Soil	3		
TRIP BLANK			Water	2		

Comments/Special Instructions	Relinquished by (Signature)	Received by. (Signature)	Relinquished by: (Signature)	Received by (Signature)
	Printed Name: Claudia De La Vía	Printed Name: A. Volgardsen	Printed Name:	Printed Name
	Company: Geo Engineers	Company: ARI	Company	Company
	Date & Time: 12/11/14 1525	Date & Time: 12/11/14 1525	Date & Time.	Date & Time

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

TAS Revisions 12-11-14

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Analytical Chemists and Consultants
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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
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ARI Assigned Number: ZPV6	Turn-around Requested: standard
ARI Client Company: Geoengineers	Phone: 206-239-3231
Client Contact: Zanna Satterwhite	
Client Project Name: Gas Works Park - Play Area Investigation	
Client Project #: 0186-846-01 Task 1520	Samplers: Robert Moyahan & Claudia DeLaVia

Page: 1 of 2 | Date: 12/11/14 | Ice Present? | No. of Coolers: | Cooler Temps:

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Hold	Arsenic 6010	PAHs EPA 8270 SIM (Low Level)	BTEX EPA 8260 (Low Level)					Notes/Comments
PAI-9-3-3.5	12/11	0850	Soil	6	X								XXF>1000 1pm As
PAI-9-9.5-10.0	12/11	0910	Soil	6	X								X
PAI-9-11.5-12.0	12/11	0920	Soil	6	X								
PAI-9-12.5-13.0	12/11	0930	Soil	6		X	X	X					X
PAI-9-12.5-13.0DUP	12/11	0930	Soil	6		X	X	X					X
PAI-9-17.5-18.0	12/11	0945	Soil	6	X								
RINSATE-141211	12/11	1010	Water	3		X	X						
PAI-10-9.5-10.0	12/11	1145	Soil	6		X	X	X					
PAI-10-14.5-15.0	12/11	1150	Soil	6	X								
PAI-10-19.5-20.0	12/11	1210	Soil	6			X	X					

Comments/Special Instructions

Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)	(Signature)	(Signature)	(Signature)
Printed Name: Claudia DeLaVia	Printed Name: A Volgardsen	Printed Name:	Printed Name:
Company: Geoengineers	Company: ARI	Company:	Company:
Date & Time: 12/11/14 1525	Date & Time: 12/11/14 1525	Date & Time:	Date & Time:

ZPV6 : 9911

ZAS Revision 12-11-14

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested: Standard	
ARI Client Company: Geo Engineers	Phone: 206-239-3231	
Client Contact: Zanna Satterwhite		
Client Project Name: Gas Works Park - Play Area Investigation		
Client Project #: 0186-846-01 Task 1520	Samplers: Robert Miyahira / Claudia De La Via	

Page: 2	of 2
Date: 12/11/14	Ice Present?
No. of Coolers:	Cooler Temps:

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Hold	Arsenic 6010	PAHs EPA 8270SIM (low level)	BTEX EPA 8260 (low level)	Sequential Extraction (As, Fe)*	Acid Insoluble Sulfur ASTM E1915	Acid Extractable Sulfide SM4500-S2D		Notes/Comments XRF >1000 ppm As
PAI-10-24.5-25.0	12/11	1215	Soil	6		X	X	X					
PAI-10-29.5-30.0	12/11	1220	Soil	6	X								
PAI-10-31.5-32.0	12/11	1230	Soil	3					X	X	X		Dry ice core
PAI-11-12.0-12.5	12/11	1350	Soil	3					X	X	X		Black is bottom of core
PAI-11-18.5-19.0	12/11	1400	Soil	3	X								↓
PAI-11-28.0-28.5	12/11	1430	Soil	3	X								?
PAI-11-22-22.5	12/11	1420	Soil	3					X	X	X		↓
TRIP BLANK			Water	2				X					
PAI-9-23-23.5	12/11		Soil	6		X							

Comments/Special Instructions	Relinquished by	Received by	Relinquished by	Received by
* per 12-10-14 quote	(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Claudia De La Via	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: Geo Engineers	Company: ARI	Company	Company:
	Date & Time: 12/11/14 1525	Date & Time: 12/11/14 1525	Date & Time:	Date & Time:

...its of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program ...ts standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for ... services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co... ...ed agreement between ARI and the Client.

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Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client. GeoEngineers | Project Name. Gas Works Park - PAI

COC No(s). _____ (NA) | Delivered by: Fed-Ex UPS Courier Hand Delivered Other. _____

Assigned ARI Job No. ZP16 | Tracking No. _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2 0-6 0 °C for chemistry) 6.6 +2 5.5 4.6 ___ ___

Time: 1633

If cooler temperature is out of compliance fill out form 00070F | Temp Gun ID#: 90077457

Cooler Accepted by: AV Date: 12/11/14 Time: 1535

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	(Bubble Wrap) (Wet Ice) (Gel Packs) (Baggies) Foam Block Paper Other DUX		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	(NA AV)	(YES)	NO
Were all VOC vials free of air bubbles?	NA	(YES)	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	12/10/14	

Was Sample Split by ARI : (NA) YES Date/Time:_____ Equipment:_____ Split by:_____

Samples Logged by. AV Date: 12/15/14 Time. 1455

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

PAI-11-22-22.5 both ~~8~~4oz Jars have cracked bottoms. Sulfur Jar replacedino volume lost

By: AV Date: 12/15/14

Small Air Bubbles – 2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • •	● ● ●

Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

PRESERVATION VERIFICATION 12/15/14
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **ZP16**

Inquiry Number: NONE
Analysis Requested: 12/15/14
Contact: Satterwhite, Zanna
Client: Geoengineers
Logged by: AV
Sample Set Used: Yes-490
Validatable Package: Lv4
Deliverables:

PC: Cheronne
VTSR: 12/11/14

Project #: 0186-846-01 Task 1520
Project: Gas Works Park-Play Area Investigat
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-27430 **ZP16V**	RINSATE-141211						TOT															

ZP15-0990.14

Checked By AV Date 12/15/14

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: ZP15, ZP16

ANALYTICAL
RESOURCES
INCORPORATED

Case Narrative

Client: GeoEngineers, Inc.
Project: Gas Works Park-Play Area Investigation, 0186-846-01 Task 1520
ARI Job Nos.: ZP15 & ZP16

Sample Receipt

Two water samples and a trip blank were received on December 15, 2014 under ARI job ZP15. The cooler temperatures measured by IR thermometer following ARI SOP were 5.2 and 5.6°C. For further details regarding sample receipt, please refer to the Cooler Receipt Form.

Seventeen soil samples, one water sample, and a trip blank were received on December 11, 2014 under ARI job ZP16. Select samples were archived upon receipt. The cooler temperatures measured by IR thermometer following ARI SOP were -18.0, 4.6, 5.5, and 6.0°C. For further details regarding sample receipt, please refer to the Cooler Receipt Form.

BETX by SW8260C

The samples were analyzed within the method recommended holding times.

Sample **PAI-9-12.5-13.0** was diluted due to high Naphthalene content.

Initial and continuing calibrations were within method requirements. Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blanks were clean at the reporting limits. The LCS and LCSD percent recoveries were within control limits.

PAHs by SW8270-SIM

The soil samples were extracted and analyzed within method recommended holding times.

Two five-hundred milliliter amber glass bottles were submitted for each water sample. One bottle from each sample was filtered prior to extraction using a 0.7 micron borosilicate glass, binder free filter. The filtered samples have been reported under ARI IDs ZP15E and ZP15F. All water volumes were extracted and analyzed within method recommended holding times.

Initial and continuing calibrations were within method requirements. Internal standard areas were within limits.

The surrogate percent recovery of d14-Dibenzo(a,h)anthracene fell outside the control limits low for sample **PAI-10-19.5-20.0**. The sample was re-analyzed twice more at dilutions. No further corrective action was taken.

Naphthalene was present in **MB-122414** at a level that was greater than ½ the reporting limit. All detected results for this compound have been flagged with a "B" qualifier. No further corrective action was taken.

The LCS and LCSD percent recoveries were within control limits.

Metals by SW6010C

The samples and associated laboratory QC were digested and analyzed within recommended holding times.

The method blanks were clean at the reporting limits. The LCS percent recoveries were within control limits.

The matrix spike percent recoveries were within control limits.

The duplicate RPDs of arsenic were outside the control limit for samples **MW-36D-141215** and **PAI-9-12.5-13.0**. All relevant data have been flagged with a "*" qualifier on the appropriate Form VI. No further corrective action was taken.

General Chemistry Parameters

The samples and associated laboratory QC were initially prepared and analyzed within recommended holding times.

The percent recovery of the initial soil analysis of the sulfide LCS fell outside control limits low. All soil samples were re-analyzed outside the method recommended holding time of seven days. Only the soil re-analysis results have been reported. Both sets of raw data have been included in this package for review. No further corrective action was taken.

The DOC method blank result was greater than the reporting limit due to possible filter blank contamination. Associated sample results may be slightly bias high. No corrective action was taken.

The LCS percent recoveries were within control limits.

The SRM percent recoveries were within limits.

The matrix spike percent recoveries and replicate RPDs were within control limits.

Subcontract Analyses

All subcontracted results have been included in this data package.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: GeoEngineers	**Client Project No.:** 0186-846-01 Task 1520
ARI Job No.: ZP15	**Client Project:** Gas Works Park-Play Area Investigation

Case Narrative

1. Two samples were submitted for filtering on December 16, 2014.
2. The samples were filtered using all glass filtering equipment. All equipment was decontaminated prior to use.
3. All of the water was filtered through a 0.7µm borosilicate glass, binder free filter. All of the filters were burned at 440 °C for 15 minutes prior to use.
4. A filter blank of deionized water was created for this job.
5. The samples were filtered and then placed into appropriate sample bottles for the requested analysis.
6. There were no noted anomalies in the samples or methods.

Released by: _____ Date: Dec. 29, 2014
Geotechnical Laboratory Supervisor

Reviewed by: _____ Date: 12/29/14
Reviewer

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: ZP15
Client: Geoengineers
Project Event: 0186-846-01 Task 1520
Project Name: Gas Works Park-Play Area Investigat

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-36D-141215	ZP15A	14-27518	Water	12/15/14 10:00	12/15/14 13:50
2.	MW-36S-141215	ZP15B	14-27519	Water	12/15/14 11:30	12/15/14 13:50
3.	TRIP BLANK(1)	ZP15C	14-27520	Water	12/15/14	12/15/14 13:50
4.	TRIP BLANK(2)	ZP15D	14-27521	Water	12/15/14	12/15/14 13:50
5.	MW-36D-141215	ZP15E	14-27522	Water	12/15/14 10:00	12/15/14 13:50
6.	MW-36S-141215	ZP15F	14-27523	Water	12/15/14 11:30	12/15/14 13:50

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: ZP16
Client: Geoengineers
Project Event: 0186-846-01 Task 1520
Project Name: Gas Works Park-Play Area Investigat

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PAI-9-12.5-13.0	ZP16A	14-27409	Soil	12/11/14 09:30	12/11/14 15:25
2.	PAI-9-12.5-13-DUP	ZP16B	14-27410	Soil	12/11/14 09:30	12/11/14 15:25
3.	PAI-10-9.5-10.0	ZP16C	14-27411	Soil	12/11/14 11:45	12/11/14 15:25
4.	PAI-10-19.5-20.0	ZP16D	14-27412	Soil	12/11/14 12:10	12/11/14 15:25
5.	PAI-10-24.5-25.0	ZP16E	14-27413	Soil	12/11/14 12:15	12/11/14 15:25
6.	PAI-10-31.5-32.0	ZP16F	14-27414	Soil	12/11/14 12:30	12/11/14 15:25
7.	PAI-11-12.0-12.5	ZP16G	14-27415	Soil	12/11/14 13:50	12/11/14 15:25
8.	PAI-11-22-22.5	ZP16H	14-27416	Soil	12/11/14 14:20	12/11/14 15:25
9.	PAI-9-23-23.5	ZP16I	14-27417	Soil	12/11/14	12/11/14 15:25
10.	PAI-10-31.5-32.0	ZP16J	14-27418	Soil	12/11/14 12:30	12/11/14 15:25
11.	PAI-11-12.0-12.5	ZP16K	14-27419	Soil	12/11/14 13:50	12/11/14 15:25
12.	PAI-11-22-22.5	ZP16L	14-27420	Soil	12/11/14 14:20	12/11/14 15:25
13.	TRIP BLANKS	ZP16M	14-27421	Water	12/11/14	12/11/14 15:25
14.	PAI-9-3-3.5	ZP16N	14-27422	Soil	12/11/14 08:50	12/11/14 15:25
15.	PAI-9-9.5-10.0	ZP16O	14-27423	Soil	12/11/14 09:10	12/11/14 15:25
16.	PAI-9-11.5-12.0	ZP16P	14-27424	Soil	12/11/14 09:20	12/11/14 15:25
17.	PAI-9-17.5-18.0	ZP16Q	14-27425	Soil	12/11/14 09:45	12/11/14 15:25
18.	PAI-10-14.5-15.0	ZP16R	14-27426	Soil	12/11/14 11:50	12/11/14 15:25
19.	PAI-10-29.5-30.0	ZP16S	14-27427	Soil	12/11/14 12:20	12/11/14 15:25
20.	PAI-11-18.5-19.0	ZP16T	14-27428	Soil	12/11/14 14:00	12/11/14 15:25
21.	PAI-11-28.0-28.5	ZP16U	14-27429	Soil	12/11/14 14:30	12/11/14 15:25
22.	RINSATE-141211	ZP16V	14-27430	Water	12/11/14 10:10	12/11/14 15:25

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 12/31/13

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
8260C VOA in Water (EPA 8260C)								
Preservation: pH<2; HCL, Cool <6°C								
Container: VOA Vial, Clear, 40 mL, HCL		**Amount Required:** 120 mL				**Hold Time:** 14 days		
Chloromethane	0.0948	0.500 ug/L		30	77 - 122	30	77 - 122	30
Vinyl Chloride	0.0572	0.200 ug/L		30	74 - 123	30	74 - 123	30
Bromomethane	0.252	1.00 ug/L		30	68 - 130	30	68 - 130	30
Chloroethane	0.0861	0.200 ug/L		30	68 - 133	30	68 - 133	30
Trichlorofluoromethane	0.0375	0.200 ug/L		30	74 - 135	30	74 - 135	30
Acrolein	2.48	5.00 ug/L		30	60 - 124	30	60 - 124	30
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.0429	0.200 ug/L		30	76 - 124	30	76 - 124	30
Acetone	2.06	5.00 ug/L		30	64 - 125	30	64 - 125	30
1,1-Dichloroethene	0.0540	0.200 ug/L		30	74 - 120	30	74 - 120	30
Bromoethane	0.0412	0.200 ug/L		30	77 - 122	30	77 - 122	30
Iodomethane	0.227	1.00 ug/L		30	76 - 123	30	76 - 123	30
Methylene Chloride	0.485	1.00 ug/L		30	71 - 125	30	71 - 125	30
Acrylonitrile	0.604	1.00 ug/L		30	76 - 123	30	76 - 123	30
Carbon Disulfide	0.0370	0.200 ug/L		30	77 - 124	30	77 - 124	30
trans-1,2-Dichloroethene	0.0485	0.200 ug/L		30	75 - 120	30	75 - 120	30
Vinyl Acetate	0.0688	0.200 ug/L		30	74 - 120	30	74 - 120	30
1,1-Dichloroethane	0.0533	0.200 ug/L		30	80 - 120	30	80 - 120	30
2-Butanone	0.814	5.00 ug/L		30	73 - 123	30	73 - 123	30
2,2-Dichloropropane	0.0518	0.200 ug/L		30	72 - 133	30	72 - 133	30
cis-1,2-Dichloroethene	0.0427	0.200 ug/L		30	78 - 120	30	78 - 120	30
Chloroform	0.0273	0.200 ug/L		30	80 - 120	30	80 - 120	30
Bromochloromethane	0.0607	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,1,1-Trichloroethane	0.0408	0.200 ug/L		30	79 - 124	30	79 - 124	30
1,1-Dichloropropene	0.0340	0.200 ug/L		30	80 - 120	30	80 - 120	30
Carbon tetrachloride	0.0439	0.200 ug/L		30	71 - 139	30	71 - 139	30
1,2-Dichloroethane	0.0717	0.200 ug/L		30	80 - 121	30	80 - 121	30
Benzene	0.0266	0.200 ug/L		30	80 - 120	30	80 - 120	30
Trichloroethene	0.0489	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,2-Dichloropropane	0.0352	0.200 ug/L		30	80 - 120	30	80 - 120	30
Bromodichloromethane	0.0506	0.200 ug/L		30	80 - 122	30	80 - 122	30
Dibromomethane	0.145	0.200 ug/L		30	80 - 120	30	80 - 120	30
2-Chloroethyl vinyl ether	0.250	1.00 ug/L		30	62 - 130	30	62 - 130	30
4-Methyl-2-Pentanone	0.974	5.00 ug/L		30	80 - 125	30	80 - 125	30
cis-1,3-Dichloropropene	0.0610	0.200 ug/L		30	80 - 127	30	80 - 127	30
Toluene	0.0399	0.200 ug/L		30	80 - 120	30	80 - 120	30
trans-1,3-Dichloropropene	0.0815	0.200 ug/L		30	79 - 132	30	79 - 132	30
2-Hexanone	0.902	5.00 ug/L		30	80 - 129	30	80 - 129	30
1,1,2-Trichloroethane	0.129	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,3-Dichloropropane	0.0622	0.200 ug/L		30	80 - 120	30	80 - 120	30
Tetrachloroethene	0.0474	0.200 ug/L		30	80 - 120	30	80 - 120	30
Dibromochloromethane	0.0481	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,2-Dibromoethane	0.0745	0.200 ug/L		30	80 - 120	30	80 - 120	30
Chlorobenzene	0.0230	0.200 ug/L		30	80 - 120	30	80 - 120	30
Ethylbenzene	0.0371	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,1,1,2-Tetrachloroethane	0.0396	0.200 ug/L		30	80 - 128	30	80 - 128	30
m,p-Xylene	0.0522	0.400 ug/L		30	80 - 120	30	80 - 120	30

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
o-Xylene	0.0349	0.200 ug/L		30	80 - 120	30	80 - 120	30
Styrene	0.0454	0.200 ug/L		30	80 - 121	30	80 - 121	30
Bromoform	0.0618	0.200 ug/L		30	62 - 149	30	62 - 149	30
1,1,2,2-Tetrachloroethane	0.0598	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,2,3-Trichloropropane	0.131	0.500 ug/L		30	80 - 120	30	80 - 120	30
trans-1,4-Dichloro 2-Butene	0.324	1.00 ug/L		30	47 - 147	30	47 - 147	30
n-Propylbenzene	0.0235	0.200 ug/L		30	80 - 120	30	80 - 120	30
Bromobenzene	0.0605	0.200 ug/L		30	80 - 120	30	80 - 120	30
Isopropyl Benzene	0.0212	0.200 ug/L		30	80 - 120	30	80 - 120	30
2-Chlorotoluene	0.0236	0.200 ug/L		30	80 - 120	30	80 - 120	30
4-Chlorotoluene	0.0159	0.200 ug/L		30	80 - 120	30	80 - 120	30
t-Butylbenzene	0.0256	0.200 ug/L		30	80 - 121	30	80 - 121	30
1,3,5-Trimethylbenzene	0.0150	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,2,4-Trimethylbenzene	0.0243	0.200 ug/L		30	80 - 122	30	80 - 122	30
s-Butylbenzene	0.0237	0.200 ug/L		30	80 - 121	30	80 - 121	30
4-Isopropyl Toluene	0.0263	0.200 ug/L		30	80 - 124	30	80 - 124	30
1,3-Dichlorobenzene	0.0362	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,4-Dichlorobenzene	0.0397	0.200 ug/L		30	80 - 120	30	80 - 120	30
n-Butylbenzene	0.0248	0.200 ug/L		30	80 - 125	30	80 - 125	30
1,2-Dichlorobenzene	0.0365	0.200 ug/L		30	80 - 120	30	80 - 120	30
1,2-Dibromo-3-chloropropane	0.366	0.500 ug/L		30	79 - 129	30	79 - 129	30
1,2,4-Trichlorobenzene	0.107	0.500 ug/L		30	77 - 127	30	77 - 127	30
Hexachloro-1,3-Butadiene	0.0734	0.500 ug/L		30	80 - 135	30	80 - 135	30
Naphthalene	0.118	0.500 ug/L		30	80 - 128	30	80 - 128	30
1,2,3-Trichlorobenzene	0.110	0.500 ug/L		30	80 - 125	30	80 - 125	30
Dichlorodifluoromethane	0.0521	0.200 ug/L		30	68 - 133	30	68 - 133	30
Methyl tert-butyl Ether	0.0729	0.500 ug/L		30	79 - 121	30	79 - 121	30
n-Hexane	0.100	0.200 ug/L						
surr: 1,2-Dichloroethane-d4			80 - 120					
surr: 1,2-Dichlorobenzene-d4			80 - 120					
surr: Toluene-d8			80 - 120					
surr: 4-Bromofluorobenzene			80 - 120					
surr: Dibromofluoromethane			80 - 120					
Pentafluorobenzene								
Chlorobenzene-d5								
1,4-Difluorobenzene								
1,4-Dichlorobenzene-d4								

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
8260C VOA Solid in Solid (EPA 8260C)								
Preservation: NaHSO4, MeOH, Cool <6°C								
Container: VOA Vial, Clear, 40 mL, Na2S2O3		**Amount Required:** 15 g				**Hold Time:** 14 days		
Dichlorodifluoromethane	0.207	1.00 ug/kg		30	67 - 142	30	67 - 142	30
Chloromethane	0.263	1.00 ug/kg		30	65 - 129	30	65 - 129	30
Vinyl Chloride	0.235	1.00 ug/kg		30	74 - 134	30	74 - 134	30
Bromomethane	0.187	1.00 ug/kg		30	40 - 172	30	40 - 172	30
Chloroethane	0.462	1.00 ug/kg		30	53 - 154	30	53 - 154	30
Trichlorofluoromethane	0.266	1.00 ug/kg		30	57 - 161	30	57 - 161	30
Acrolein	3.81	50.0 ug/kg		30	60 - 130	30	60 - 130	30
Acetone	0.482	5.00 ug/kg		30	48 - 132	30	48 - 132	30
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.287	2.00 ug/kg		30	72 - 142	30	72 - 142	30
1,1-Dichloroethene	0.336	1.00 ug/kg		30	73 - 138	30	73 - 138	30
Bromoethane	0.440	2.00 ug/kg		30	74 - 132	30	74 - 132	30
Iodomethane	0.215	1.00 ug/kg		30	34 - 181	30	34 - 181	30
Methylene Chloride	0.635	2.00 ug/kg		30	61 - 128	30	61 - 128	30
Carbon Disulfide	0.559	1.00 ug/kg		30	72 - 146	30	72 - 146	30
Acrylonitrile	1.03	5.00 ug/kg		30	59 - 124	30	59 - 124	30
Methyl tert-butyl Ether	0.231	1.00 ug/kg		30	68 - 124	30	68 - 124	30
trans-1,2-Dichloroethene	0.266	1.00 ug/kg		30	73 - 131	30	73 - 131	30
Vinyl Acetate	0.381	5.00 ug/kg		30	54 - 138	30	54 - 138	30
1,1-Dichloroethane	0.203	1.00 ug/kg		30	65 - 139	30	65 - 139	30
2-Butanone	0.513	5.00 ug/kg		30	64 - 120	30	64 - 120	30
2,2-Dichloropropane	0.292	1.00 ug/kg		30	77 - 137	30	77 - 137	30
cis-1,2-Dichloroethene	0.240	1.00 ug/kg		30	75 - 124	30	75 - 124	30
Chloroform	0.234	1.00 ug/kg		30	75 - 126	30	75 - 126	30
Bromochloromethane	0.323	1.00 ug/kg		30	69 - 133	30	69 - 133	30
1,1,1-Trichloroethane	0.226	1.00 ug/kg		30	78 - 133	30	78 - 133	30
1,1-Dichloropropene	0.312	1.00 ug/kg		30	80 - 123	30	80 - 123	30
Carbon tetrachloride	0.213	1.00 ug/kg		30	76 - 136	30	76 - 136	30
1,2-Dichloroethane	0.191	1.00 ug/kg		30	77 - 120	30	77 - 120	30
Benzene	0.296	1.00 ug/kg		30	80 - 120	30	80 - 120	30
Trichloroethene	0.212	1.00 ug/kg		30	80 - 120	30	80 - 120	30
1,2-Dichloropropane	0.162	1.00 ug/kg		30	74 - 120	30	74 - 120	30
Bromodichloromethane	0.254	1.00 ug/kg		30	80 - 122	30	80 - 122	30
Dibromomethane	0.147	1.00 ug/kg		30	80 - 120	30	80 - 120	30
2-Chloroethyl vinyl ether	0.276	5.00 ug/kg		30	20 - 157	30	20 - 157	30
4-Methyl-2-Pentanone	0.420	5.00 ug/kg		30	70 - 124	30	70 - 124	30
cis-1,3-Dichloropropene	0.226	1.00 ug/kg		30	80 - 124	30	80 - 124	30
Toluene	0.151	1.00 ug/kg		30	78 - 120	30	78 - 120	30
trans-1,3-Dichloropropene	0.216	1.00 ug/kg		30	80 - 126	30	80 - 126	30
1,1,2-Trichloroethane	0.286	1.00 ug/kg		30	77 - 120	30	77 - 120	30
1,2-Dibromoethane	0.176	1.00 ug/kg		30	79 - 120	30	79 - 120	30
2-Hexanone	0.439	5.00 ug/kg		30	62 - 128	30	62 - 128	30
1,3-Dichloropropane	0.209	1.00 ug/kg		30	77 - 120	30	77 - 120	30
Tetrachloroethene	0.257	1.00 ug/kg		30	76 - 131	30	76 - 131	30
Dibromochloromethane	0.266	1.00 ug/kg		30	77 - 123	30	77 - 123	30
Chlorobenzene	0.219	1.00 ug/kg		30	80 - 120	30	80 - 120	30
1,1,1,2-Tetrachloroethane	0.233	1.00 ug/kg		30	80 - 120	30	80 - 120	30

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Ethylbenzene	0.202	1.00 ug/kg		30	80 - 120	30	80 - 120	30
m,p-Xylene	0.392	1.00 ug/kg		30	80 - 123	30	80 - 123	30
o-Xylene	0.224	1.00 ug/kg		30	80 - 120	30	80 - 120	30
Styrene	0.138	1.00 ug/kg		30	80 - 122	30	80 - 122	30
Bromoform	0.297	1.00 ug/kg		30	63 - 120	30	63 - 120	30
Isopropyl Benzene	0.233	1.00 ug/kg		30	77 - 127	30	77 - 127	30
1,1,2,2-Tetrachloroethane	0.253	1.00 ug/kg		30	71 - 120	30	71 - 120	30
1,2,3-Trichloropropane	0.517	2.00 ug/kg		30	75 - 120	30	75 - 120	30
trans-1,4-Dichloro 2-Butene	0.437	5.00 ug/kg		30	62 - 127	30	62 - 127	30
n-Propylbenzene	0.272	1.00 ug/kg		30	76 - 126	30	76 - 126	30
Bromobenzene	0.153	1.00 ug/kg		30	75 - 120	30	75 - 120	30
1,3,5-Trimethylbenzene	0.254	1.00 ug/kg		30	77 - 126	30	77 - 126	30
2-Chlorotoluene	0.300	1.00 ug/kg		30	76 - 120	30	76 - 120	30
4-Chlorotoluene	0.277	1.00 ug/kg		30	75 - 121	30	75 - 121	30
t-Butylbenzene	0.306	1.00 ug/kg		30	77 - 125	30	77 - 125	30
1,2,4-Trimethylbenzene	0.230	1.00 ug/kg		30	77 - 125	30	77 - 125	30
s-Butylbenzene	0.240	1.00 ug/kg		30	77 - 127	30	77 - 127	30
4-Isopropyl Toluene	0.236	1.00 ug/kg		30	78 - 131	30	78 - 131	30
1,3-Dichlorobenzene	0.227	1.00 ug/kg		30	76 - 120	30	76 - 120	30
1,4-Dichlorobenzene	0.232	1.00 ug/kg		30	75 - 120	30	75 - 120	30
n-Butylbenzene	0.262	1.00 ug/kg		30	75 - 134	30	75 - 134	30
1,2-Dichlorobenzene	0.293	1.00 ug/kg		30	77 - 120	30	77 - 120	30
1,2-Dibromo-3-Chloropropane	0.586	5.00 ug/kg		30	61 - 128	30	61 - 128	30
1,2,4-Trichlorobenzene	0.332	5.00 ug/kg		30	75 - 130	30	75 - 130	30
Hexachloro-1,3-Butadiene	0.410	5.00 ug/kg		30	72 - 135	30	72 - 135	30
Naphthalene	0.429	5.00 ug/kg		30	71 - 122	30	71 - 122	30
1,2,3-Trichlorobenzene	0.305	5.00 ug/kg		30	76 - 122	30	76 - 122	30
surr: 1,2-Dichloroethane-d4			80 - 149					
surr: 1,2-Dichlorobenzene-d4			80 - 120					
surr: Toluene-d8			77 - 120					
surr: 4-Bromofluorobenzene			80 - 120					
surr: Dibromofluoromethane			80 - 120					
Pentafluorobenzene								
Chlorobenzene-d5								
1,4-Difluorobenzene								
1,4-Dichlorobenzene-d4								

Analytical Resources, Inc.

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Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
8270D-SIM PAH (0.1 ug/L) in Water (EPA 8270D-SIM)								
Preservation: Cool <6°C								
Container: Glass NM, Amber, 500 mL		**Amount Required:** 1000			**Hold Time:** 7 days			
Naphthalene	0.0296	0.100 ug/L		30	33 - 120	30	33 - 120	30
2-Methylnaphthalene	0.0302	0.100 ug/L		30	29 - 120	30	29 - 120	30
1-Methylnaphthalene	0.0289	0.100 ug/L		30	37 - 120	30	37 - 120	30
Biphenyl				30	30 - 160	30	30 - 160	40
2,6-Dimethylnaphthalene				30	30 - 160	30	30 - 160	40
Acenaphthylene	0.0380	0.100 ug/L		30	32 - 120	30	32 - 120	30
Acenaphthene	0.0304	0.100 ug/L		30	38 - 120	30	38 - 120	30
Dibenzofuran	0.0280	0.100 ug/L		30	38 - 120	30	38 - 120	30
2,3,5-Trimethylnaphthalene				30				
Fluorene	0.0278	0.100 ug/L		30	41 - 120	30	41 - 120	30
Dibenzothiophene				30				
Phenanthrene	0.0279	0.100 ug/L		30	49 - 120	30	49 - 120	30
Anthracene	0.0352	0.100 ug/L		30	39 - 120	30	39 - 120	30
Carbazole				30	30 - 160	30	30 - 160	40
1-Methylphenanthrene				30	30 - 160	30	30 - 160	40
Fluoranthene	0.0347	0.100 ug/L		30	48 - 120	30	48 - 120	30
Pyrene	0.0434	0.100 ug/L		30	48 - 120	30	48 - 120	30
Benzo(a)anthracene	0.0399	0.100 ug/L		30	37 - 120	30	37 - 120	30
Chrysene	0.0321	0.100 ug/L		30	48 - 120	30	48 - 120	30
Benzo(b)fluoranthene	0.0417	0.100 ug/L		30	38 - 128	30	38 - 128	30
Benzo(k)fluoranthene	0.0433	0.100 ug/L		30	36 - 130	30	36 - 130	30
Benzo(j)fluoranthene	0.0376	0.100 ug/L		30	49 - 120	30	49 - 120	30
Benzo(e)pyrene				30	30 - 160	30	30 - 160	30
Benzo(a)pyrene	0.0429	0.100 ug/L		30	25 - 120	30	25 - 120	30
Perylene	0.0420	0.100 ug/L		30	30 - 160	30	30 - 160	30
Indeno(1,2,3-cd)pyrene	0.0422	0.100 ug/L		30	32 - 120	30	32 - 120	30
Dibenzo(a,h)anthracene	0.0535	0.100 ug/L		30	21 - 120	30	21 - 120	30
Benzo(g,h,i)perylene	0.0388	0.100 ug/L		30	28 - 120	30	28 - 120	30
surr: 2-Methylnaphthalene-d10			31 - 120					
surr: Dibenzo[a,h]anthracene-d14			10 - 125					
surr: Fluoranthene-d10			46 - 121					
Naphthalene-d8								
Acenaphthene-d10								
Phenanthrene-d10								
Chrysene-d12								
Perylene-d12								

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
8270D-SIM PAH (5 ug/kg) in Solid (EPA 8270D-SIM)								
Preservation: Cool <6°C								
Container: Glass WM, Clear, 8 oz		**Amount Required:** 150 g				**Hold Time:** 14 days		
Naphthalene	2.26	5.00 ug/kg		30	36 - 120	30	36 - 120	30
2-Methylnaphthalene	1.69	5.00 ug/kg		30	35 - 120	30	35 - 120	30
1-Methylnaphthalene	1.61	5.00 ug/kg		30	39 - 120	30	39 - 120	30
Biphenyl	1.44	5.00 ug/kg		30	30 - 160	30	30 - 160	30
2,6-Dimethylnaphthalene	0.750	5.00 ug/kg		30	30 - 160	30	30 - 160	30
Acenaphthylene	1.61	5.00 ug/kg		30	35 - 120	30	35 - 120	30
Acenaphthene	1.49	5.00 ug/kg		30	39 - 120	30	39 - 120	30
Dibenzofuran	1.41	5.00 ug/kg		30	38 - 120	30	38 - 120	30
2,3,5-Trimethylnaphthalene	0.419	5.00 ug/kg		30		30		30
Fluorene	1.47	5.00 ug/kg		30	41 - 120	30	41 - 120	30
Dibenzothiophene	0.425	5.00 ug/kg		30		30		30
Phenanthrene	1.58	5.00 ug/kg		30	46 - 120	30	46 - 120	30
Anthracene	1.78	5.00 ug/kg		30	36 - 120	30	36 - 120	30
Carbazole	0.189	5.00 ug/kg		30	30 - 160	30	30 - 160	30
1-Methylphenanthrene	0.700	5.00 ug/kg		30	30 - 160	30	30 - 160	30
Fluoranthene	1.87	5.00 ug/kg		30	46 - 120	30	46 - 120	30
Pyrene	2.26	5.00 ug/kg		30	49 - 120	30	49 - 120	30
Benzo(a)anthracene	2.22	5.00 ug/kg		30	42 - 120	30	42 - 120	30
Chrysene	1.92	5.00 ug/kg		30	48 - 120	30	48 - 120	30
Benzo(b)fluoranthene	2.11	5.00 ug/kg		30	35 - 127	30	35 - 127	30
Benzo(k)fluoranthene	2.28	5.00 ug/kg		30	37 - 129	30	37 - 129	30
Benzo(j)fluoranthene	1.75	5.00 ug/kg		30	40 - 120	30	40 - 120	30
Benzo(e)pyrene	0.647	5.00 ug/kg		30	30 - 160	30	30 - 160	30
Benzo(a)pyrene	2.38	5.00 ug/kg		30	36 - 120	30	36 - 120	30
Perylene	3.56	5.00 ug/kg		30	44 - 120	30	44 - 120	30
Indeno(1,2,3-cd)pyrene	3.01	5.00 ug/kg		30	40 - 120	30	40 - 120	30
Dibenzo(a,h)anthracene	2.56	5.00 ug/kg		30	38 - 120	30	38 - 120	30
Benzo(g,h,i)perylene	2.79	5.00 ug/kg		30	38 - 120	30	38 - 120	30
surr: 2-Methylnaphthalene-d10			32 - 120					
surr: Dibenzo[a,h]anthracene-d14			21 - 133					
surr: Fluoranthene-d10			36 - 134					
Naphthalene-d8								
Acenaphthene-d10								
Phenanthrene-d10								
Chrysene-d12								
Perylene-d12								

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Met Diss 6010C in Water (EPA 6010C)								
Preservation: pH<2; HNO3, Cool <6°C								
Container: HDPE NM, 500 mL			**Amount Required:** 500 mL			**Hold Time:** 180 days		
Aluminum	0.00757	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Antimony	0.00628	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Arsenic	0.00333	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Barium	0.00133	0.00300 mg/L		20	75 - 125	20	80 - 120	20
Beryllium	0.000160	0.00100 mg/L		20	75 - 125	20	80 - 120	20
Boron	0.00739	0.0200 mg/L		20	75 - 125	20	80 - 120	20
Cadmium	0.000180	0.00200 mg/L		20	75 - 125	20	80 - 120	20
Calcium	0.0113	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Chromium	0.00124	0.00500 mg/L		20	75 - 125	20	80 - 120	20
Cobalt	0.000270	0.00300 mg/L		20	75 - 125	20	80 - 120	20
Copper	0.000920	0.00200 mg/L		20	75 - 125	20	80 - 120	20
Iron	0.00750	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Lead	0.00155	0.0200 mg/L		20	75 - 125	20	80 - 120	20
Magnesium	0.00961	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Manganese	0.000280	0.00100 mg/L		20	75 - 125	20	80 - 120	20
Molybdenum	0.000790	0.00500 mg/L		20	75 - 125	20	80 - 120	20
Nickel	0.00386	0.0100 mg/L		20	75 - 125	20	80 - 120	20
Potassium	0.0657	0.500 mg/L		20	75 - 125	20	80 - 120	20
Selenium	0.00499	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Silicon	0.00817	0.0600 mg/L		20	75 - 125	20	80 - 120	20
Silver	0.000430	0.00300 mg/L		20	75 - 125	20	80 - 120	20
Sodium	0.0114	0.500 mg/L		20	75 - 125	20	80 - 120	20
Sodium-1	1.14	50.0 mg/L		20	75 - 125	20	80 - 120	20
Strontium	0.0000900	0.00100 mg/L		20	75 - 125	20	80 - 120	20
Thallium	0.00310	0.0500 mg/L		20	75 - 125	20	80 - 120	20
Tin	0.00141	0.0100 mg/L		20	75 - 125	20	80 - 120	20
Titanium	0.00211	0.00500 mg/L		20	75 - 125	20	80 - 120	20
Vanadium	0.000270	0.00300 mg/L		20	75 - 125	20	80 - 120	20
Zinc	0.00145	0.0100 mg/L		20	75 - 125	20	80 - 120	20

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Met 6010C in Solid (EPA 6010C)								
Preservation: Cool <6°C								
Container: Glass WM, Clear, 4 oz		**Amount Required:** 100 g				**Hold Time:** 180 days		
Aluminum	0.757	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Antimony	0.628	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Arsenic	0.333	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Barium	0.133	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Beryllium	0.0160	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Boron	0.739	2.00 mg/kg		20	75 - 125	20	80 - 120	20
Cadmium	0.0180	0.200 mg/kg		20	75 - 125	20	80 - 120	20
Calcium	1.13	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Chromium	0.124	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Cobalt	0.0270	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Copper	0.0920	0.200 mg/kg		20	75 - 125	20	80 - 120	20
Iron	0.750	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Lead	0.155	2.00 mg/kg		20	75 - 125	20	80 - 120	20
Magnesium	0.961	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Manganese	0.0280	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Molybdenum	0.0790	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Nickel	0.386	1.00 mg/kg		20	75 - 125	20	80 - 120	20
Potassium	6.57	50.0 mg/kg		20	75 - 125	20	80 - 120	20
Selenium	0.499	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Silver	0.0430	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Sodium	1.14	50.0 mg/kg		20	75 - 125	20	80 - 120	20
Sodium-1	114	5000 mg/kg		20	75 - 125	20	80 - 120	20
Strontium	0.00900	0.100 mg/kg		20	75 - 125	20	80 - 120	20
Thallium	0.310	5.00 mg/kg		20	75 - 125	20	80 - 120	20
Tin	0.141	1.00 mg/kg		20	75 - 125	20	80 - 120	20
Titanium	0.211	0.500 mg/kg		20	75 - 125	20	80 - 120	20
Vanadium	0.0270	0.300 mg/kg		20	75 - 125	20	80 - 120	20
Zinc	0.145	1.00 mg/kg		20	75 - 125	20	80 - 120	20

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Alkalinity, Carbonate SM 2320 B-97 in Water (SM 2320 B-97)								
Preservation: Cool <6°C								
Container: HDPE NM, 500 mL, No Headspace		**Amount Required:** 500 mL					**Hold Time:** 14 days	
Alkalinity, Carbonate		mg/L CaCO3		20				

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Alkalinity, Bicarbonate SM 2320 B-97 in Water (SM 2320 B-97)								
Preservation: Cool <6°C								
Container: HDPE NM, 500 mL, No Headspace		**Amount Required:** 500 mL					**Hold Time:** 14 days	
Alkalinity, Bicarbonate		mg/L CaCO3		20				

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Alkalinity, Hydroxide SM 2320 B-97 in Water (SM 2320 B-97)								
Preservation: Cool <6°C								
Container: HDPE NM, 500 mL, No Headspace		**Amount Required:** 500 mL				**Hold Time:** 14 days		
Alkalinity, Hydroxide		mg/L CaCO3		20				

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Solids, Total Dissolved EPA 160.1 in Water (EPA 160.1)								
Preservation: Cool <6°C								
Container: HDPE NM, 1000 mL		**Amount Required:** 1000 mL				**Hold Time:** 7 days		
Dissolved Solids		1.00 mg/L		20				

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Iron, Ferrous SM 3500-Fe B-97 in Water (SM 3500-Fe B-97)								
Preservation: HCL								
Container: Glass NM, Amber, 500 mL, HCl		**Amount Required:** 500 mL				**Hold Time:** 0.01 days		
Ferrous Iron	0.0100	0.0400 mg/L		20	75 - 125		75 - 125	20

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Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Anions, EPA 300.0 in Water (EPA 300.0)								
Preservation: None								
Container: Small OJ, 500 mL		**Amount Required:** 500 mL			**Hold Time:** 28 days			
Fluoride	0.0110	0.100 mg/L		20	75 - 125		90 - 110	20
Chloride	0.0300	0.100 mg/L		20	75 - 125		90 - 110	20
Nitrite-N	0.0240	0.100 mg/L		20	75 - 125		90 - 110	20
Bromide	0.00700	0.100 mg/L		20	75 - 125		90 - 110	20
Nitrate-N	0.0180	0.100 mg/L		20	75 - 125		90 - 110	20
Phosphate-P	0.0200	0.100 mg/L		20	75 - 125		90 - 110	20
Sulfate	0.0460	0.100 mg/L		20	75 - 125		90 - 110	20

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Chloride, EPA 325.2 in Water (SM 4500-CL⁻ G-9)								
Preservation: None								
Container: Small OJ, 500 mL			**Amount Required:** 500 mL			**Hold Time:** 28 days		
Chloride	0.400	1.00 mg/L		20	75 - 125		75 - 125	20

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Sulfide, SM 4500-S2 D-0 in Water (SM 4500-S2 D-00)								
Preservation: ZnOAc, Cool <6°C (NaOH added at lab)								
Container: Small OJ, 500 mL, ZnOAC		**Amount Required:** 250 mL				**Hold Time:** 7 days		
Sulfide	0.0300	0.0500 mg/L		20	75 - 125		75 - 125	20

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Organic Carbon, Total, 9060A in Water (EPA 9060A)								
Preservation: pH<2; H2SO4, Cool <6°C								
Container: Glass NM, Amber, 250 mL, 9N H2SO4		**Amount Required:** 250 mL				**Hold Time:** 28 days		
Total Organic Carbon		1.50 mg/L		20	75 - 125		75 - 125	20

Analytical Method Information

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Organic Carbon, Dissolved EPA 9060A in Water (EPA 9060A)								
Preservation: pH<2; H2SO4, Cool <6°C								
Container: Glass NM, Amber, 250 mL, 9N H2SO4		**Amount Required:** 250 mL				**Hold Time:** 28 days		
Total Organic Carbon		1.50 mg/L		20	75 - 125		75 - 125	20

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: ZP15, ZP16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-36D-141215**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP15A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 12/31/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Instrument/Analyst: NT3/LH
Date Analyzed: 12/23/14 16:38

Sample Amount: 0.020 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	13	100	9,100
108-88-3	**Toluene**	20	100	540
100-41-4	**Ethylbenzene**	19	100	2,200
179601-23-1	**m,p-Xylene**	26	200	1,300
95-47-6	**o-Xylene**	17	100	880

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	102%
Bromofluorobenzene	99.9%
d4-1,2-Dichlorobenzene	97.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-36S-141215**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP15B
LIMS ID: 14-27519
Matrix: Water
Data Release Authorized:
Reported: 12/31/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Instrument/Analyst: NT3/LH
Date Analyzed: 12/23/14 17:08

Sample Amount: 0.20 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	1.3	10	260
108-88-3	Toluene	2.0	10	800
100-41-4	Ethylbenzene	1.9	10	310
179601-23-1	m,p-Xylene	2.6	20	2,100
95-47-6	o-Xylene	1.7	10	850

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	99.1%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: TRIP BLANK(1)**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP15C
LIMS ID: 14-27520
Matrix: Water
Data Release Authorized:
Reported: 12/31/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Instrument/Analyst: NT3/LH
Date Analyzed: 12/23/14 13:22

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	0.03	0.20	< 0.20 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.03	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	99.5%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: TRIP BLANK(2)**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP15D
LIMS ID: 14-27521
Matrix: Water
Data Release Authorized:
Reported: 12/31/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Instrument/Analyst: NT3/LH
Date Analyzed: 12/23/14 13:49

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	0.03	0.20	< 0.20 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.03	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-122314A	Method Blank	10	105%	100%	98.3%	99.4%	0
LCS-122314A	Lab Control	10	104%	102%	100%	102%	0
LCSD-122314A	Lab Control Dup	10	99.8%	102%	101%	98.4%	0
ZP15A	MW-36D-141215	10	106%	102%	99.9%	97.8%	0
ZP15B	MW-36S-141215	10	102%	101%	99.1%	100%	0
ZP15C	TRIP BLANK(1)	10	102%	101%	99.5%	101%	0
ZP15D	TRIP BLANK(2)	10	102%	101%	100%	100%	0

	LCS/MB LIMITS	QC LIMITS
SW8260C		
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-120)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 14-27518 to 14-27521

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-9-12.5-13.0**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP16A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized: MW
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 13:30

Sample Amount: 8.87 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 10.7%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	170	560	< 560 U
108-88-3	Toluene	85	560	< 560 U
100-41-4	Ethylbenzene	110	560	< 560 U
179601-23-1	m,p-Xylene	220	560	< 560 U
95-47-6	o-Xylene	130	560	< 560 U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	89.8%
d8-Toluene	104%
Bromofluorobenzene	98.0%
d4-1,2-Dichlorobenzene	97.6%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-9-12.5-13-DUP**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP16B
LIMS ID: 14-27410
Matrix: Soil
Data Release Authorized: MW
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 15:34

Sample Amount: 87.0 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 10.4%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	**17**	**57**	**78**
108-88-3	**Toluene**	**8.7**	**57**	**45 J**
100-41-4	**Ethylbenzene**	**12**	**57**	**120**
179601-23-1	**m,p-Xylene**	**23**	**57**	**47 J**
95-47-6	o-Xylene	13	57	< 57 U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	87.0%
d8-Toluene	104%
Bromofluorobenzene	99.6%
d4-1,2-Dichlorobenzene	100%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-10-9.5-10.0**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP16C
LIMS ID: 14-27411
Matrix: Soil
Data Release Authorized:
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 14:19

Sample Amount: 2.86 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 42.7%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	520	1700	16,000
108-88-3	**Toluene**	260	1700	15,000
100-41-4	**Ethylbenzene**	350	1700	71,000
179601-23-1	**m,p-Xylene**	690	1700	82,000
95-47-6	**o-Xylene**	390	1700	46,000

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	88.4%
d8-Toluene	102%
Bromofluorobenzene	96.2%
d4-1,2-Dichlorobenzene	98.9%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-10-19.5-20.0**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP16D
LIMS ID: 14-27412
Matrix: Soil
Data Release Authorized: MW
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 15:58

Sample Amount: 4.64 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 21.4%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	320	1100	22,000
108-88-3	**Toluene**	160	1100	2,900
100-41-4	**Ethylbenzene**	220	1100	3,400
179601-23-1	**m,p-Xylene**	420	1100	4,300
95-47-6	**o-Xylene**	240	1100	1,200

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	84.4%
d8-Toluene	102%
Bromofluorobenzene	97.4%
d4-1,2-Dichlorobenzene	99.9%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: PAI-10-24.5-25.0**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP16E
LIMS ID: 14-27413
Matrix: Soil
Data Release Authorized:
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 16:23

Sample Amount: 1.93 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: 30.4%

CAS Number	Analyte	DL	LOQ	Result
71-43-2	**Benzene**	770	2600	22,000
108-88-3	**Toluene**	390	2600	4,700
100-41-4	**Ethylbenzene**	520	2600	25,000
179601-23-1	**m,p-Xylene**	1000	2600	11,000
95-47-6	**o-Xylene**	580	2600	3,300

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	85.4%
d8-Toluene	94.4%
Bromofluorobenzene	97.0%
d4-1,2-Dichlorobenzene	97.1%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: TRIP BLANKS**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ZP16M
LIMS ID: 14-27421
Matrix: Water
Data Release Authorized:
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 10:37

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	0.25	1.0	< 1.0 U
108-88-3	Toluene	0.18	1.0	< 1.0 U
100-41-4	Ethylbenzene	0.18	1.0	< 1.0 U
179601-23-1	m,p-Xylene	0.36	2.0	< 2.0 U
95-47-6	o-Xylene	0.22	1.0	< 1.0 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	88.0%
d8-Toluene	104%
Bromofluorobenzene	97.2%
d4-1,2-Dichlorobenzene	98.1%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-122314A	Method Blank	Med	88.8%	100%	97.0%	98.9%	0
LCS-122314A	Lab Control	Med	92.4%	101%	98.2%	98.3%	0
LCSD-122314A	Lab Control Dup	Med	87.2%	102%	99.0%	98.5%	0
ZP16A	PAI-9-12.5-13.0	Med	89.8%	104%	98.0%	97.6%	0
ZP16B	PAI-9-12.5-13-DUP	Med	87.0%	104%	99.6%	100%	0
ZP16C	PAI-10-9.5-10.0	Med	88.4%	102%	96.2%	98.9%	0
ZP16D	PAI-10-19.5-20.0	Med	84.4%	102%	97.4%	99.9%	0
ZP16E	PAI-10-24.5-25.0	Med	85.4%	94.4%	97.0%	97.1%	0

SW8260C	LCS/MB LIMITS Low	LCS/MB LIMITS Med	QC LIMITS Low	QC LIMITS Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	80-149	80-124
(TOL) = d8-Toluene	77-120	80-120	77-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 14-27409 to 14-27413

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-122314A	Method Blank	5	88.8%	100%	97.0%	98.9%	0
LCS-122314A	Lab Control	5	92.4%	101%	98.2%	98.3%	0
LCSD-122314A	Lab Control Dup	5	87.2%	102%	99.0%	98.5%	0
ZP16M	TRIP BLANKS	5	88.0%	104%	97.2%	98.1%	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	80-149	80-125
(TOL) = d8-Toluene	77-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120

Prep Method: SW5030B
Log Number Range: 14-27421 to 14-27421

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-122314A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-122314A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 12/31/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT3/LH
LCSD: NT3/LH
Date Analyzed LCS: 12/23/14 10:08
LCSD: 12/23/14 10:35

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	10.3	10.0	103%	10.1	10.0	101%	2.0%
Toluene	10.1	10.0	101%	10.1	10.0	101%	0.0%
Ethylbenzene	10.4	10.0	104%	10.3	10.0	103%	1.0%
m,p-Xylene	20.8	20.0	104%	20.5	20.0	102%	1.5%
o-Xylene	9.99	10.0	99.9%	9.94	10.0	99.4%	0.5%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	104%	99.8%
d8-Toluene	102%	102%
Bromofluorobenzene	100%	101%
d4-1,2-Dichlorobenzene	102%	98.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-122314A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-122314A
LIMS ID: 14-27421
Matrix: Water
Data Release Authorized:
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT5/PAB
LCSD: NT5/PAB
Date Analyzed LCS: 12/23/14 08:33
LCSD: 12/23/14 08:58

Sample Amount LCS: 5.00 mL
LCSD: 5.00 mL
Purge Volume LCS: 5.0 mL
LCSD: 5.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	46.9	50.0	93.8%	50.3	50.0	101%	7.0%
Toluene	55.1	50.0	110%	55.2	50.0	110%	0.2%
Ethylbenzene	53.0	50.0	106%	53.6	50.0	107%	1.1%
m,p-Xylene	106	100	106%	107	100	107%	0.9%
o-Xylene	53.0	50.0	106%	52.7	50.0	105%	0.6%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	92.4%	87.2%
d8-Toluene	101%	102%
Bromofluorobenzene	98.2%	99.0%
d4-1,2-Dichlorobenzene	98.3%	98.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-122314A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-122314A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT5/PAB
LCSD: NT5/PAB
Date Analyzed LCS: 12/23/14 08:33
LCSD: 12/23/14 08:58

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt
Purge Volume LCS: 5.0 mL
LCSD: 5.0 mL
Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	2350	2500	94.0%	2520	2500	101%	7.0%
Toluene	2750	2500	110%	2760	2500	110%	0.4%
Ethylbenzene	2650	2500	106%	2680	2500	107%	1.1%
m,p-Xylene	5320	5000	106%	5340	5000	107%	0.4%
o-Xylene	2650	2500	106%	2630	2500	105%	0.8%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	92.4%	87.2%
d8-Toluene	101%	102%
Bromofluorobenzene	98.2%	99.0%
d4-1,2-Dichlorobenzene	98.3%	98.5%

4A
VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB1223

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP15

Project: GAS WORKS PARK-PLAY ARE

Lab File ID: MB1223

Lab Sample ID: MB1223

Date Analyzed: 12/23/14

Time Analyzed: 1102

Instrument ID: NT3

Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS1223	LCS1223	LCS1223	1008
02	LCS1223	LCS1223	LCS1223A	1035
03	TRIP BLANK(1	ZP15C	ZP15C	1322
04	TRIP BLANK(2	ZP15D	ZP15D	1349
05	MW-36D-14121	ZP15A	ZP15A	1638
06	MW-36S-14121	ZP15B	ZP15B	1708
07				
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COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-122314A**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-122314A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized: MW
Reported: 12/31/14

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT3/LH
Date Analyzed: 12/23/14 11:02

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	0.03	0.20	< 0.20 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.03	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	100%
Bromofluorobenzene	98.3%
d4-1,2-Dichlorobenzene	99.4%

4A

VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB1223

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP16

Project: GAS WORKS PARK

Lab File ID: MB1223

Lab Sample ID: MB1223

Date Analyzed: 12/23/14

Time Analyzed: 0922

Instrument ID: NT5

Heated Purge: (Y/N) Y

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS1223	LCS1223	LCS1223	0833
02	LCS1223	LCS1223	LCS1223A	0858
03	TRIP BLANK	ZP06C	ZP06C	0947
04	TRIP BLANK	ZP11K	ZP11K	1012
05	TRIP BLANKS	ZP16M	ZP16M	1037
06	PAI-9-12.5-1	ZP16A	ZP16A	1330
07	PAI-10-9.5-1	ZP16C	ZP16C	1419
08	PAI-8-14.5-1	ZP11I	ZP11I2	1444
09	PAI-3-33.5-3	ZP11G	ZP11G2	1509
10	PAI-9-12.5-1	ZP16B	ZP16B2	1534
11	PAI-10-19.5-	ZP16D	ZP16D	1558
12	PAI-10-24.5-	ZP16E	ZP16E	1623
13	PAI-11-9.5-1	ZP06A	ZP06A	1648
14	PAI-11-18.0-	ZP06B	ZP06B	1713
15	PAI-4-16.0-1	ZP11C	ZP11C	1737
16	PAI-3-13.0-1	ZP11D	ZP11D	1802
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COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-122314A**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-122314A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 09:22

Sample Amount: 100 mg-dry-wt
Purge Volume: 5.0 mL
Moisture: NA

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	15	50	< 50 U
108-88-3	Toluene	7.6	50	< 50 U
100-41-4	Ethylbenzene	10	50	< 50 U
179601-23-1	m,p-Xylene	20	50	< 50 U
95-47-6	o-Xylene	11	50	< 50 U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	88.8%
d8-Toluene	100%
Bromofluorobenzene	97.0%
d4-1,2-Dichlorobenzene	98.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-122314A**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-122314A
LIMS ID: 14-27421
Matrix: Water
Data Release Authorized: MW
Reported: 12/29/14

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT5/PAB
Date Analyzed: 12/23/14 09:22

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	DL	LOQ	Result
71-43-2	Benzene	0.25	1.0	< 1.0 U
108-88-3	Toluene	0.18	1.0	< 1.0 U
100-41-4	Ethylbenzene	0.18	1.0	< 1.0 U
179601-23-1	m,p-Xylene	0.36	2.0	< 2.0 U
95-47-6	o-Xylene	0.22	1.0	< 1.0 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	88.8%
d8-Toluene	100%
Bromofluorobenzene	97.0%
d4-1,2-Dichlorobenzene	98.9%

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOENGINEERS

Lab Code: ARI Case No.: GAS WORKS PARK-PLAY AREA SDG No.: ZP15

Lab File ID: BFB1217 BFB Injection Date: 12/17/14

Instrument ID: NT3 BFB Injection Time: 0852

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.3
75	30.0 - 60.0% of mass 95	46.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.2 (0.3)1
174	50.0 - 100.0% of mass 95	70.0
175	5.0 - 9.0% of mass 174	5.6 (8.0)1
176	95.0 - 101.0% of mass 174	67.7 (96.7)1
177	5.0 - 9.0% of mass 176	4.2 (6.3)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD0.2	SCL0021-CAL1	SCL0021CAL1	12/17/14	0948
02	VSTD80	SCL0021-CAL8	SCL0021CAL8	12/17/14	1015
03	VSTD40	SCL0021-CAL7	SCL0021CAL7	12/17/14	1045
04	VSTD20	SCL0021-CAL6	SCL0021CAL6	12/17/14	1113
05	VSTD10	SCL0021-CAL5	SCL0021CAL5	12/17/14	1140
06	VSTD02	SCL0021-CAL4	SCL0021CAL4	12/17/14	1207
07	VSTD01	SCL0021-CAL3	SCL0021CAL3	12/17/14	1235
08	VSTD0.5	SCL0021-CAL2	SCL0021CAL2	12/17/14	1302
09	ICV10	SCL0021-SCV1	SCL0021SCV1	12/17/14	1329
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5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOENGINEERS

Lab Code: ARI Case No.: GAS WORKS PARK-PLAY AREA SDG No.: ZP15

Lab File ID: BFB1223C BFB Injection Date: 12/23/14

Instrument ID: NT3 BFB Injection Time: 0905

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	46.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.6 (0.9)1
174	50.0 - 100.0% of mass 95	69.6
175	5.0 - 9.0% of mass 174	5.4 (7.8)1
176	95.0 - 101.0% of mass 174	67.1 (96.5)1
177	5.0 - 9.0% of mass 176	3.9 (5.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1223	CC1223	CC1223	12/23/14	0941
02	LCS1223	LCS1223	LCS1223	12/23/14	1008
03	LCS1223	LCS1223	LCS1223A	12/23/14	1035
04	MB1223	MB1223	MB1223	12/23/14	1102
05	TRIP BLANK(1)	ZP15C	ZP15C	12/23/14	1322
06	TRIP BLANK(2)	ZP15D	ZP15D	12/23/14	1349
07	MW-36D-141215	ZP15A	ZP15A	12/23/14	1638
08	MW-36S-141215	ZP15B	ZP15B	12/23/14	1708
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5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOENGINEERS

Lab Code: ARI Case No.: GAS WORKS PARK SDG No.: ZP16

Lab File ID: BFB1120X BFB Injection Date: 11/20/14

Instrument ID: NT5 BFB Injection Time: 1217

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.5
75	30.0 - 60.0% of mass 95	46.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.1
173	Less than 2.0% of mass 174	0.1 (0.2)1
174	50.0 - 100.0% of mass 95	77.3
175	5.0 - 9.0% of mass 174	5.9 (7.6)1
176	95.0 - 101.0% of mass 174	76.1 (98.5)1
177	5.0 - 9.0% of mass 176	5.2 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	1	SCL0002-CAL1	0011120	11/20/14	1321
02	2	SCL0002-CAL2	0021120	11/20/14	1346
03	5	SCL0002-CAL3	0051120	11/20/14	1410
04	10	SCL0002-CAL4	0101120	11/20/14	1435
05	50	SCL0002-CAL5	0501120	11/20/14	1500
06	100	SCL0002-CAL6	1001120	11/20/14	1525
07	150	SCL0002-CAL7	1501120	11/20/14	1550
08	200	SCL0002-CAL8	2001120	11/20/14	1614
09	ICV1120	SCL0002-SCV1	ICV1120	11/20/14	1639
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5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOENGINEERS

Lab Code: ARI Case No.: GAS WORKS PARK SDG No.: ZP16

Lab File ID: BFB1223 BFB Injection Date: 12/23/14

Instrument ID: NT5 BFB Injection Time: 0734

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.4
75	30.0 - 60.0% of mass 95	48.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.4
173	Less than 2.0% of mass 174	0.9 (1.1)1
174	50.0 - 100.0% of mass 95	80.1
175	5.0 - 9.0% of mass 174	5.9 (7.3)1
176	95.0 - 101.0% of mass 174	77.2 (96.3)1
177	5.0 - 9.0% of mass 176	5.4 (6.9)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1223	CC1223	CC1223	12/23/14	0808
02	LCS1223	LCS1223	LCS1223	12/23/14	0833
03	LCS1223	LCS1223	LCS1223A	12/23/14	0858
04	MB1223	MB1223	MB1223	12/23/14	0922
05	TRIP BLANK	ZP06C	ZP06C	12/23/14	0947
06	TRIP BLANK	ZP11K	ZP11K	12/23/14	1012
07	TRIP BLANKS	ZP16M	ZP16M	12/23/14	1037
08	PAI-9-12.5-13.0	ZP16A	ZP16A	12/23/14	1330
09	PAI-10-9.5-10.0	ZP16C	ZP16C	12/23/14	1419
10	PAI-8-14.5-15.0	ZP11I	ZP11I2	12/23/14	1444
11	PAI-3-33.5-34.0	ZP11G	ZP11G2	12/23/14	1509
12	PAI-9-12.5-13-DU	ZP16B	ZP16B2	12/23/14	1534
13	PAI-10-19.5-20.0	ZP16D	ZP16D	12/23/14	1558
14	PAI-10-24.5-25.0	ZP16E	ZP16E	12/23/14	1623
15	PAI-11-9.5-10	ZP06A	ZP06A	12/23/14	1648
16	PAI-11-18.0-18.5	ZP06B	ZP06B	12/23/14	1713
17	PAI-4-16.0-16.5	ZP11C	ZP11C	12/23/14	1737
18	PAI-3-13.0-13.5	ZP11D	ZP11D	12/23/14	1802
19					
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FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

LAB FILE ID: RF0.2: SCL0021CALRF0.5: SCL0021CALRF1: SCL0021CAL3
RF2: SCL0021CAL4 RF10: SCL0021CAL5

COMPOUND	RF0.2	RF0.5	RF1	RF2	RF10
Chloromethane	0.792	0.660	0.625	0.599	0.646
Vinyl Chloride	0.805	0.798	0.748	0.747	0.819
Bromomethane	0.360	0.398	0.433	0.433	0.497
Chloroethane	0.507	0.478	0.468	0.472	0.479
Trichlorofluoromethane	0.786	0.742	0.768	0.704	0.772
Acrolein	0.069	0.068	0.061	0.061	0.067
112Trichloro122Trifluoroetha	0.510	0.550	0.532	0.527	0.535
Acetone		0.119	0.122	0.116	0.107
1,1-Dichloroethene	0.438	0.455	0.562	0.554	0.586
Bromoethane	0.372	0.308	0.280	0.253	0.262
Iodomethane	0.354	0.598	0.576	0.570	0.610
Methylene Chloride			1.095	0.798	0.647
Acrylonitrile	0.240	0.195	0.178	0.173	0.169
Carbon Disulfide	2.095	2.067	2.044	1.941	2.051
Trans-1,2-Dichloroethene	0.638	0.631	0.636	0.596	0.630
Vinyl Acetate	0.200	0.217	0.218	0.206	0.192
1,1-Dichloroethane	0.937	1.066	1.048	1.057	1.072
2-Butanone	0.242	0.216	0.212	0.205	0.210
2,2-Dichloropropane	0.802	0.756	0.727	0.788	0.832
Cis-1,2-Dichloroethene	0.592	0.607	0.643	0.652	0.654
Chloroform	0.973	0.944	0.961	0.938	0.968
Bromochloromethane	0.260	0.295	0.266	0.248	0.282
1,1,1-Trichloroethane	0.826	0.780	0.800	0.786	0.802
1,1-Dichloropropene	0.444	0.503	0.452	0.452	0.472
Carbon Tetrachloride	0.361	0.334	0.337	0.337	0.366
1,2-Dichloroethane	0.393	0.387	0.387	0.360	0.372
Benzene	1.514	1.485	1.383	1.384	1.418
Trichloroethene	0.349	0.324	0.334	0.326	0.337
1,2-Dichloropropane	0.372	0.338	0.355	0.351	0.364
Bromodichloromethane	0.378	0.416	0.392	0.383	0.404
Dibromomethane	0.171	0.169	0.179	0.176	0.176
2-Chloroethyl Vinyl Ether		0.180	0.195	0.191	0.208
4-Methyl-2-Pentanone	0.263	0.267	0.268	0.256	0.280
Cis 1,3-dichloropropene	0.548	0.520	0.510	0.519	0.546
Toluene	0.947	0.934	0.907	0.892	0.900
Trans 1,3-Dichloropropene	0.462	0.468	0.445	0.439	0.488
2-Hexanone	0.169	0.186	0.198	0.187	0.209

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

LAB FILE ID: RF0.2: SCL0021CALRF0.5: SCL0021CALRF1: SCL0021CAL3
RF2: SCL0021CAL4 RF10: SCL0021CAL5

COMPOUND	RF0.2	RF0.5	RF1	RF2	RF10
1,1,2-Trichloroethane	0.264	0.258	0.271	0.273	0.279
1,3-Dichloropropane	0.594	0.580	0.564	0.550	0.551
Tetrachloroethene	0.313	0.337	0.327	0.327	0.334
Chlorodibromomethane	0.239	0.255	0.282	0.285	0.308
1,2-Dibromoethane	0.230	0.267	0.270	0.260	0.269
Chlorobenzene	1.424	1.135	1.072	1.043	1.018
Ethyl Benzene	1.962	1.851	1.762	1.761	1.786
1,1,1,2-Tetrachloroethane	0.285	0.297	0.291	0.297	0.319
m,p-xylene	0.702	0.690	0.699	0.685	0.698
o-Xylene	0.723	0.690	0.676	0.665	0.686
Styrene	1.066	1.044	1.096	1.080	1.135
Bromoform	0.293	0.292	0.263	0.292	0.324
1,1,2,2-Tetrachloroethane	0.825	0.750	0.698	0.749	0.737
1,2,3-Trichloropropane		0.233	0.212	0.215	0.214
Trans-1,4-Dichloro 2-Butene		0.208	0.210	0.185	0.207
N-Propyl Benzene	3.747	3.730	3.818	3.787	3.792
Bromobenzene	0.743	0.756	0.722	0.745	0.734
Isopropyl Benzene	3.502	3.397	3.349	3.294	3.249
2-Chloro Toluene	2.339	2.323	2.316	2.321	2.350
4-Chloro Toluene	2.463	2.517	2.413	2.510	2.489
T-Butyl Benzene	2.135	2.173	2.237	2.196	2.178
1,3,5-Trimethyl Benzene	2.597	2.677	2.596	2.630	2.669
1,2,4-Trimethylbenzene	2.669	2.684	2.656	2.685	2.703
S-Butyl Benzene	3.086	3.198	3.154	3.188	3.103
4-Isopropyl Toluene	2.468	2.412	2.496	2.547	2.569
1,3-Dichlorobenzene	1.478	1.452	1.466	1.460	1.456
1,4-Dichlorobenzene	1.505	1.561	1.485	1.542	1.489
N-Butyl Benzene	2.261	2.310	2.302	2.335	2.323
1,2-Dichlorobenzene	1.555	1.471	1.424	1.411	1.412
1,2-Dibromo 3-Chloropropane		0.126	0.124	0.114	0.123
1,2,4-Trichlorobenzene		0.869	0.794	0.808	0.787
Hexachloro 1,3-Butadiene		0.284	0.264	0.273	0.230
Naphthalene		2.058	2.089	2.074	2.059
1,2,3-Trichlorobenzene		0.719	0.716	0.715	0.673
Dichlorodifluoromethane	0.467	0.468	0.469	0.373	0.518
Methyl tert butyl ether	1.699	1.681	1.664	1.620	1.681

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

LAB FILE ID: RF0.2: SCL0021CALRF0.5: SCL0021CALRF1: SCL0021CAL3
RF2: SCL0021CAL4 RF10: SCL0021CAL5

COMPOUND	RF0.2	RF0.5	RF1	RF2	RF10
d4-1,2-Dichloroethane	0.541	0.537	0.545	0.528	0.531
d8-Toluene	1.243	1.249	1.250	1.232	1.260
4-Bromofluorobenzene	0.508	0.517	0.504	0.506	0.508
d4-1,2-Dichlorobenzene	0.900	0.914	0.921	0.915	0.917
Dibromofluoromethane	0.505	0.492	0.485	0.486	0.487

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

LAB FILE ID: RF20: SCL0021CAL6RF40: SCL0021CAL7RF80: SCL0021CAL8

COMPOUND	RF20	RF40	RF80
Chloromethane	0.643	0.653	0.713
Vinyl Chloride	0.788	0.796	0.851
Bromomethane	0.517	0.525	0.523
Chloroethane	0.484	0.470	0.494
Trichlorofluoromethane	0.769	0.848	0.880
Acrolein	0.073	0.075	0.074
112Trichloro122Trifluoroetha	0.545	0.550	0.410
Acetone	0.108	0.110	0.109
1,1-Dichloroethene	0.576	0.585	0.488
Bromoethane	0.251	0.260	0.253
Iodomethane	0.468	0.449	0.475
Methylene Chloride	0.660	0.647	0.660
Acrylonitrile	0.173	0.180	0.180
Carbon Disulfide	2.024	2.067	1.572
Trans-1,2-Dichloroethene	0.631	0.646	0.654
Vinyl Acetate	0.220	0.228	0.223
1,1-Dichloroethane	1.078	1.106	1.104
2-Butanone	0.212	0.218	0.214
2,2-Dichloropropane	0.855	0.879	0.876
Cis-1,2-Dichloroethene	0.657	0.665	0.668
Chloroform	0.961	0.984	0.982
Bromochloromethane	0.276	0.281	0.282
1,1,1-Trichloroethane	0.808	0.828	0.824
1,1-Dichloropropene	0.457	0.472	0.463
Carbon Tetrachloride	0.361	0.373	0.374
1,2-Dichloroethane	0.361	0.369	0.366
Benzene	1.353	1.328	1.164
Trichloroethene	0.328	0.332	0.333
1,2-Dichloropropane	0.346	0.354	0.347
Bromodichloromethane	0.394	0.403	0.395
Dibromomethane	0.168	0.172	0.171
2-Chloroethyl Vinyl Ether	0.202	0.210	0.207
4-Methyl-2-Pentanone	0.265	0.259	0.227
Cis 1,3-dichloropropene	0.541	0.552	0.534
Toluene	0.866	0.861	0.802
Trans 1,3-Dichloropropene	0.479	0.488	0.481
2-Hexanone	0.205	0.205	0.194

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

LAB FILE ID: RF20: SCL0021CAL6RF40: SCL0021CAL7RF80: SCL0021CAL8

COMPOUND	RF20	RF40	RF80
1,1,2-Trichloroethane	0.265	0.268	0.267
1,3-Dichloropropane	0.557	0.552	0.534
Tetrachloroethene	0.332	0.339	0.333
Chlorodibromomethane	0.309	0.317	0.314
1,2-Dibromoethane	0.262	0.270	0.265
Chlorobenzene	0.998	0.987	0.907
Ethyl Benzene	1.745	1.650	1.368
1,1,1,2-Tetrachloroethane	0.321	0.326	0.324
m,p-xylene	0.693	0.675	0.597
o-Xylene	0.675	0.682	0.652
Styrene	1.134	1.115	1.013
Bromoform	0.331	0.357	0.365
1,1,2,2-Tetrachloroethane	0.735	0.764	0.738
1,2,3-Trichloropropane	0.210	0.227	0.221
Trans-1,4-Dichloro 2-Butene	0.213	0.226	0.224
N-Propyl Benzene	3.697	3.522	2.908
Bromobenzene	0.728	0.760	0.751
Isopropyl Benzene	3.154	3.084	2.630
2-Chloro Toluene	2.302	2.293	2.083
4-Chloro Toluene	2.433	2.424	2.170
T-Butyl Benzene	2.159	2.160	1.952
1,3,5-Trimethyl Benzene	2.643	2.625	2.326
1,2,4-Trimethylbenzene	2.660	2.672	2.351
S-Butyl Benzene	3.056	3.019	2.560
4-Isopropyl Toluene	2.511	2.535	2.209
1,3-Dichlorobenzene	1.435	1.455	1.377
1,4-Dichlorobenzene	1.487	1.507	1.412
N-Butyl Benzene	2.321	2.332	2.060
1,2-Dichlorobenzene	1.366	1.388	1.314
1,2-Dibromo 3-Chloropropane	0.125	0.126	0.128
1,2,4-Trichlorobenzene	0.766	0.787	0.758
Hexachloro 1,3-Butadiene	0.230	0.224	0.209
Naphthalene	1.954	1.946	1.774
1,2,3-Trichlorobenzene	0.636	0.640	0.611
Dichlorodifluoromethane	0.524	0.545	0.555
Methyl tert butyl ether	1.685	1.668	1.621

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

LAB FILE ID: RF20: SCL0021CAL6RF40: SCL0021CAL7RF80: SCL0021CAL8

COMPOUND	RF20	RF40	RF80
d4-1,2-Dichloroethane	0.531	0.530	0.518
d8-Toluene	1.226	1.223	1.239
4-Bromofluorobenzene	0.518	0.515	0.514
d4-1,2-Dichlorobenzene	0.913	0.914	0.917
Dibromofluoromethane	0.494	0.491	0.454

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.666	9.0
Vinyl Chloride	AVRG	0.794	4.3
Bromomethane	AVRG	0.461	13.7
Chloroethane	AVRG	0.482	2.8
Trichlorofluoromethane	AVRG	0.784	7.2
Acrolein	AVRG	0.069	7.9
112Trichloro122Trifluoroetha	AVRG	0.520	8.9
Acetone	AVRG	0.113	5.2
1,1-Dichloroethene	AVRG	0.531	11.4
Bromoethane	AVRG	0.280	15.0
Iodomethane	AVRG	0.513	17.6
Methylene Chloride	LINR		0.9997
Acrylonitrile	AVRG	0.186	12.4
Carbon Disulfide	AVRG	1.983	8.7
Trans-1,2-Dichloroethene	AVRG	0.633	2.7
Vinyl Acetate	AVRG	0.213	5.8
1,1-Dichloroethane	AVRG	1.059	5.0
2-Butanone	AVRG	0.216	5.1
2,2-Dichloropropane	AVRG	0.814	6.8
Cis-1,2-Dichloroethene	AVRG	0.642	4.3
Chloroform	AVRG	0.964	1.7
Bromochloromethane	AVRG	0.274	5.5
1,1,1-Trichloroethane	AVRG	0.807	2.2
1,1-Dichloropropene	AVRG	0.464	4.0
Carbon Tetrachloride	AVRG	0.355	4.7
1,2-Dichloroethane	AVRG	0.374	3.4
Benzene	AVRG	1.379	7.8
Trichloroethene	AVRG	0.333	2.4
1,2-Dichloropropane	AVRG	0.353	3.0
Bromodichloromethane	AVRG	0.395	3.1
Dibromomethane	AVRG	0.173	2.2
2-Chloroethyl Vinyl Ether	AVRG	0.199	5.3
4-Methyl-2-Pentanone	AVRG	0.261	5.8
Cis 1,3-dichloropropene	AVRG	0.534	2.9
Toluene	AVRG	0.889	5.2
Trans 1,3-Dichloropropene	AVRG	0.469	4.0
2-Hexanone	AVRG	0.194	6.8

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.268	2.4
1,3-Dichloropropane	AVRG	0.560	3.4
Tetrachloroethene	AVRG	0.330	2.4
Chlorodibromomethane	AVRG	0.289	10.1
1,2-Dibromoethane	AVRG	0.262	5.1
Chlorobenzene	AVRG	1.073	14.6
Ethyl Benzene	AVRG	1.736	10.0
1,1,1,2-Tetrachloroethane	AVRG	0.308	5.4
m,p-xylene	AVRG	0.680	5.1
o-Xylene	AVRG	0.681	3.0
Styrene	AVRG	1.085	4.0
Bromoform	AVRG	0.315	11.2
1,1,2,2-Tetrachloroethane	AVRG	0.750	4.8
1,2,3-Trichloropropane	AVRG	0.219	3.9
Trans-1,4-Dichloro 2-Butene	AVRG	0.210	6.4
N-Propyl Benzene	AVRG	3.625	8.4
Bromobenzene	AVRG	0.742	1.8
Isopropyl Benzene	AVRG	3.207	8.4
2-Chloro Toluene	AVRG	2.291	3.8
4-Chloro Toluene	AVRG	2.428	4.6
T-Butyl Benzene	AVRG	2.149	4.0
1,3,5-Trimethyl Benzene	AVRG	2.595	4.3
1,2,4-Trimethylbenzene	AVRG	2.635	4.4
S-Butyl Benzene	AVRG	3.046	6.8
4-Isopropyl Toluene	AVRG	2.468	4.7
1,3-Dichlorobenzene	AVRG	1.447	2.1
1,4-Dichlorobenzene	AVRG	1.499	3.0
N-Butyl Benzene	AVRG	2.280	4.0
1,2-Dichlorobenzene	AVRG	1.418	5.0
1,2-Dibromo 3-Chloropropane	AVRG	0.124	3.7
1,2,4-Trichlorobenzene	AVRG	0.796	4.6
Hexachloro 1,3-Butadiene	AVRG	0.245	11.6
Naphthalene	AVRG	1.994	5.6
1,2,3-Trichlorobenzene	AVRG	0.673	6.7
Dichlorodifluoromethane	AVRG	0.490	12.0
Methyl tert butyl ether	AVRG	1.665	1.8

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Calibration Date: 12/17/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.533	1.6
d8-Toluene	AVRG	1.240	1.0
4-Bromofluorobenzene	AVRG	0.511	1.0
d4-1,2-Dichlorobenzene	AVRG	0.914	0.7
Dibromofluoromethane	AVRG	0.487	3.0

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF1: 0011120 RF2: 0021120 RF5: 0051120
RF10: 0101120 RF50: 0501120

COMPOUND	RF1	RF2	RF5	RF10	RF50
Chloromethane	0.949	1.008	0.921	1.124	1.051
Vinyl Chloride	0.867	0.917	0.810	1.046	1.016
Bromomethane	0.494	0.469	0.373	0.467	0.349
Chloroethane	0.578	0.777	0.578	0.685	0.600
Trichlorofluoromethane	1.172	1.211	1.065	1.204	1.146
Acrolein	0.135	0.143	0.127	0.148	0.142
112Trichloro122Trifluoroetha	0.684	0.665	0.612	0.675	0.605
Acetone	0.269	0.238	0.176	0.199	0.180
1,1-Dichloroethene	0.651	0.636	0.590	0.682	0.601
Bromoethane	0.491	0.452	0.394	0.505	0.406
Iodomethane	0.165	0.143	0.148	0.267	0.384
Methylene Chloride		0.954	0.756	0.805	0.712
Acrylonitrile	0.255	0.288	0.282	0.305	0.302
Carbon Disulfide	2.309	2.143	1.980	2.280	1.989
Trans-1,2-Dichloroethene	0.747	0.804	0.745	0.804	0.778
Vinyl Acetate	0.363	0.366	0.366	0.362	0.364
1,1-Dichloroethane	1.416	1.460	1.412	1.505	1.466
2-Butanone	0.076	0.075	0.081	0.088	0.082
2,2-Dichloropropane	1.057	1.097	1.090	1.162	1.135
Cis-1,2-Dichloroethene	0.797	0.805	0.814	0.830	0.803
Chloroform	1.279	1.258	1.206	1.284	1.231
Bromochloromethane	0.319	0.372	0.366	0.356	0.350
1,1,1-Trichloroethane	1.148	1.152	1.134	1.201	1.162
1,1-Dichloropropene	0.419	0.427	0.429	0.433	0.415
Carbon Tetrachloride	0.392	0.401	0.378	0.407	0.394
1,2-Dichloroethane	0.339	0.393	0.377	0.392	0.364
Benzene	1.171	1.263	1.207	1.275	1.157
Trichloroethene	0.307	0.314	0.306	0.330	0.298
1,2-Dichloropropane	0.350	0.309	0.329	0.334	0.318
Bromodichloromethane	0.362	0.382	0.375	0.391	0.371
Dibromomethane	0.151	0.158	0.163	0.163	0.156
2-Chloroethyl Vinyl Ether	0.163	0.184	0.189	0.184	0.186
4-Methyl-2-Pentanone	0.110	0.140	0.130	0.139	0.142
Cis 1,3-dichloropropene	0.435	0.481	0.455	0.478	0.490
Toluene	0.795	0.958	0.793	0.811	0.897
Trans 1,3-Dichloropropene	0.382	0.385	0.388	0.417	0.440
2-Hexanone	0.180	0.187	0.193	0.208	0.201

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF1: 0011120 RF2: 0021120 RF5: 0051120
RF10: 0101120 RF50: 0501120

COMPOUND	RF1	RF2	RF5	RF10	RF50
1,1,2-Trichloroethane	0.210	0.271	0.240	0.279	0.269
1,3-Dichloropropane	0.373	0.391	0.369	0.425	0.397
Tetrachloroethene	0.315	0.301	0.267	0.308	0.283
Chlorodibromomethane	0.205	0.234	0.219	0.253	0.245
1,2-Dibromoethane	0.216	0.253	0.246	0.258	0.254
Chlorobenzene	0.774	0.815	0.818	0.844	0.790
Ethyl Benzene	1.466	1.465	1.389	1.522	1.396
1,1,1,2-Tetrachloroethane	0.246	0.260	0.253	0.265	0.261
m,p-xylene	0.598	0.584	0.559	0.591	0.553
o-Xylene	0.566	0.540	0.534	0.552	0.532
Styrene	0.881	0.841	0.851	0.915	0.859
Bromoform	0.267	0.263	0.248	0.272	0.280
1,1,2,2-Tetrachloroethane	0.466	0.534	0.519	0.534	0.526
1,2,3-Trichloropropane	0.164	0.176	0.173	0.190	0.170
Trans-1,4-Dichloro 2-Butene	0.133	0.142	0.128	0.150	0.152
N-Propyl Benzene	3.163	3.265	3.103	3.166	2.974
Bromobenzene	0.592	0.621	0.599	0.608	0.576
Isopropyl Benzene	2.783	2.756	2.710	2.785	2.659
2-Chloro Toluene	1.916	1.893	1.744	1.842	1.746
4-Chloro Toluene	1.932	1.999	1.885	1.885	1.832
T-Butyl Benzene	2.049	2.022	1.994	2.055	1.930
1,3,5-Trimethyl Benzene	2.325	2.267	2.224	2.315	2.195
1,2,4-Trimethylbenzene	2.245	2.277	2.261	2.292	2.179
S-Butyl Benzene	3.059	3.086	2.987	3.069	2.905
4-Isopropyl Toluene	2.404	2.503	2.435	2.480	2.384
1,3-Dichlorobenzene	1.229	1.250	1.188	1.197	1.138
1,4-Dichlorobenzene	1.372	1.342	1.237	1.214	1.158
N-Butyl Benzene	2.406	2.262	2.301	2.316	2.177
1,2-Dichlorobenzene	1.254	1.162	1.117	1.140	1.076
1,2-Dibromo 3-Chloropropane	0.086	0.075	0.086	0.090	0.096
1,2,4-Trichlorobenzene	0.958	0.809	0.751	0.760	0.718
Hexachloro 1,3-Butadiene	0.413	0.414	0.387	0.408	0.376
Naphthalene	2.262	1.943	1.927	1.946	1.839
1,2,3-Trichlorobenzene	0.793	0.726	0.716	0.701	0.667
Dichlorodifluoromethane	0.557	0.510	0.610	0.833	0.781
Methyl tert butyl ether	1.960	1.988	2.006	2.102	2.122

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF1: 0011120 RF2: 0021120 RF5: 0051120
RF10: 0101120 RF50: 0501120

COMPOUND	RF1	RF2	RF5	RF10	RF50
d4-1,2-Dichloroethane	0.726	0.738	0.728	0.735	0.750
d8-Toluene	1.240	1.408	1.252	1.247	1.338
4-Bromofluorobenzene	0.529	0.508	0.498	0.510	0.514
d4-1,2-Dichlorobenzene	0.954	0.952	0.940	0.933	0.951
Dibromofluoromethane	0.687	0.658	0.677	0.682	0.701

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF100: 1001120 RF150: 1501120 RF200: 2001120

COMPOUND	RF100	RF150	RF200
Chloromethane	1.043	1.006	1.011
Vinyl Chloride	0.975	0.965	0.940
Bromomethane	0.307	0.306	0.298
Chloroethane	0.571	0.556	0.538
Trichlorofluoromethane	1.067	1.034	0.976
Acrolein	0.118	0.112	0.103
112Trichloro122Trifluoroetha	0.593	0.610	0.564
Acetone	0.146		
1,1-Dichloroethene	0.592	0.597	0.550
Bromoethane	0.366	0.361	0.336
Iodomethane	0.415	0.433	0.395
Methylene Chloride	0.552		
Acrylonitrile	0.303	0.282	0.278
Carbon Disulfide	1.956	2.007	1.852
Trans-1,2-Dichloroethene	0.723	0.567	0.539
Vinyl Acetate	0.379	0.365	0.360
1,1-Dichloroethane	1.469	1.419	1.405
2-Butanone	0.085	0.076	0.075
2,2-Dichloropropane	1.130	1.086	1.076
Cis-1,2-Dichloroethene	0.807	0.776	0.784
Chloroform	1.248	1.203	1.192
Bromochloromethane	0.356	0.334	0.334
1,1,1-Trichloroethane	1.188	1.138	1.123
1,1-Dichloropropene	0.429	0.406	0.433
Carbon Tetrachloride	0.398	0.381	0.398
1,2-Dichloroethane	0.377	0.354	0.372
Benzene	1.208	1.146	1.212
Trichloroethene	0.301	0.293	0.299
1,2-Dichloropropane	0.327	0.314	0.325
Bromodichloromethane	0.379	0.366	0.372
Dibromomethane	0.159	0.149	0.154
2-Chloroethyl Vinyl Ether	0.199	0.209	0.197
4-Methyl-2-Pentanone	0.133	0.137	0.140
Cis 1,3-dichloropropene	0.489	0.513	0.475
Toluene	0.817	0.868	0.839
Trans 1,3-Dichloropropene	0.429	0.449	0.456
2-Hexanone	0.213	0.206	0.209

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF100: 1001120 RF150: 1501120 RF200: 2001120

COMPOUND	RF100	RF150	RF200
1,1,2-Trichloroethane	0.244	0.262	0.264
1,3-Dichloropropane	0.382	0.405	0.412
Tetrachloroethene	0.262	0.289	0.295
Chlorodibromomethane	0.244	0.256	0.262
1,2-Dibromoethane	0.238	0.255	0.261
Chlorobenzene	0.809	0.774	0.793
Ethyl Benzene	1.405	1.339	1.332
1,1,1,2-Tetrachloroethane	0.271	0.267	0.270
m,p-xylene	0.550	0.529	0.524
o-Xylene	0.546	0.530	0.537
Styrene	0.893	0.848	0.868
Bromoform	0.294	0.294	0.296
1,1,2,2-Tetrachloroethane	0.556	0.542	0.558
1,2,3-Trichloropropane	0.176	0.173	0.175
Trans-1,4-Dichloro 2-Butene	0.159	0.160	0.163
N-Propyl Benzene	2.939	2.795	2.767
Bromobenzene	0.589	0.579	0.595
Isopropyl Benzene	2.623	2.549	2.519
2-Chloro Toluene	1.758	1.727	1.735
4-Chloro Toluene	1.822	1.789	1.796
T-Butyl Benzene	1.940	1.870	1.882
1,3,5-Trimethyl Benzene	2.192	2.115	2.119
1,2,4-Trimethylbenzene	2.177	2.092	2.082
S-Butyl Benzene	2.859	2.737	2.696
4-Isopropyl Toluene	2.364	2.273	2.251
1,3-Dichlorobenzene	1.152	1.129	1.149
1,4-Dichlorobenzene	1.157	1.137	1.154
N-Butyl Benzene	2.168	2.086	2.064
1,2-Dichlorobenzene	1.086	1.067	1.095
1,2-Dibromo 3-Chloropropane	0.103	0.102	0.102
1,2,4-Trichlorobenzene	0.741	0.740	0.750
Hexachloro 1,3-Butadiene	0.384	0.384	0.392
Naphthalene	1.956	1.887	1.889
1,2,3-Trichlorobenzene	0.695	0.691	0.707
Dichlorodifluoromethane	0.760	0.743	0.719
Methyl tert butyl ether	2.137	1.776	1.540

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

LAB FILE ID: RF100: 1001120 RF150: 1501120 RF200: 2001120

COMPOUND	RF100	RF150	RF200
d4-1,2-Dichloroethane	0.746	0.711	0.700
d8-Toluene	1.248	1.311	1.195
4-Bromofluorobenzene	0.515	0.516	0.518
d4-1,2-Dichlorobenzene	0.944	0.946	0.937
Dibromofluoromethane	0.713	0.691	0.686

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	1.014	6.2
Vinyl Chloride	AVRG	0.942	8.2
Bromomethane	LINR		0.9975
Chloroethane	AVRG	0.610	13.2
Trichlorofluoromethane	AVRG	1.109	7.8
Acrolein	AVRG	0.128	12.6
112Trichloro122Trifluoroetha	AVRG	0.626	6.9
Acetone	2ORDR		0.9994
1,1-Dichloroethene	AVRG	0.612	6.8
Bromoethane	AVRG	0.414	15.1
Iodomethane	LINR		0.9962
Methylene Chloride	AVRG	0.756	19.3
Acrylonitrile	AVRG	0.287	5.8
Carbon Disulfide	AVRG	2.064	7.9
Trans-1,2-Dichloroethene	AVRG	0.714	14.5
Vinyl Acetate	AVRG	0.366	1.6
1,1-Dichloroethane	AVRG	1.444	2.5
2-Butanone	AVRG	0.080	6.4
2,2-Dichloropropane	AVRG	1.104	3.2
Cis-1,2-Dichloroethene	AVRG	0.802	2.1
Chloroform	AVRG	1.238	2.9
Bromochloromethane	AVRG	0.348	5.2
1,1,1-Trichloroethane	AVRG	1.156	2.3
1,1-Dichloropropene	AVRG	0.424	2.3
Carbon Tetrachloride	AVRG	0.394	2.5
1,2-Dichloroethane	AVRG	0.371	5.0
Benzene	AVRG	1.205	3.9
Trichloroethene	AVRG	0.306	3.8
1,2-Dichloropropane	AVRG	0.326	3.9
Bromodichloromethane	AVRG	0.375	2.4
Dibromomethane	AVRG	0.157	3.3
2-Chloroethyl Vinyl Ether	AVRG	0.189	7.2
4-Methyl-2-Pentanone	AVRG	0.134	7.8
Cis 1,3-dichloropropene	AVRG	0.477	4.9
Toluene	AVRG	0.847	6.8
Trans 1,3-Dichloropropene	AVRG	0.418	7.1
2-Hexanone	AVRG	0.200	5.8

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.255	8.8
1,3-Dichloropropane	AVRG	0.394	4.9
Tetrachloroethene	AVRG	0.290	6.5
Chlorodibromomethane	AVRG	0.240	8.1
1,2-Dibromoethane	AVRG	0.248	5.8
Chlorobenzene	AVRG	0.802	3.0
Ethyl Benzene	AVRG	1.414	4.6
1,1,1,2-Tetrachloroethane	AVRG	0.262	3.4
m,p-xylene	AVRG	0.561	4.9
o-Xylene	AVRG	0.542	2.2
Styrene	AVRG	0.869	2.9
Bromoform	AVRG	0.277	6.2
1,1,2,2-Tetrachloroethane	AVRG	0.529	5.4
1,2,3-Trichloropropane	AVRG	0.175	4.2
Trans-1,4-Dichloro 2-Butene	AVRG	0.148	8.6
N-Propyl Benzene	AVRG	3.022	6.0
Bromobenzene	AVRG	0.595	2.5
Isopropyl Benzene	AVRG	2.673	3.9
2-Chloro Toluene	AVRG	1.795	4.3
4-Chloro Toluene	AVRG	1.868	3.9
T-Butyl Benzene	AVRG	1.968	3.7
1,3,5-Trimethyl Benzene	AVRG	2.219	3.6
1,2,4-Trimethylbenzene	AVRG	2.201	3.7
S-Butyl Benzene	AVRG	2.925	5.2
4-Isopropyl Toluene	AVRG	2.387	3.8
1,3-Dichlorobenzene	AVRG	1.179	3.8
1,4-Dichlorobenzene	AVRG	1.221	7.4
N-Butyl Benzene	AVRG	2.223	5.3
1,2-Dichlorobenzene	AVRG	1.125	5.5
1,2-Dibromo 3-Chloropropane	AVRG	0.092	10.9
1,2,4-Trichlorobenzene	AVRG	0.778	9.9
Hexachloro 1,3-Butadiene	AVRG	0.395	3.7
Naphthalene	AVRG	1.956	6.6
1,2,3-Trichlorobenzene	AVRG	0.712	5.2
Dichlorodifluoromethane	AVRG	0.689	16.8
Methyl tert butyl ether	AVRG	1.954	10.4

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Calibration Date: 11/20/14

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.729	2.3
d8-Toluene	AVRG	1.280	5.3
4-Bromofluorobenzene	AVRG	0.513	1.8
d4-1,2-Dichlorobenzene	AVRG	0.945	0.8
Dibromofluoromethane	AVRG	0.687	2.4

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Cont. Calib. Date: 12/23/14

Init. Calib. Date: 12/17/14 Cont. Calib. Time: 0941

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Chloromethane	0.666	0.7268	0.100	AVRG	9.1
Vinyl Chloride	0.794	0.8704	0.010	AVRG	9.6
Bromomethane	0.461	0.3691	0.010	AVRG	-19.9
Chloroethane	0.482	0.5112	0.010	AVRG	6.0
Trichlorofluoromethane	0.784	0.7808	0.010	AVRG	-0.4
Acrolein	0.068	0.0606	0.010	AVRG	-10.9
112Trichloro122Trifluoroetha	0.520	0.5706	0.010	AVRG	9.7
Acetone	0.113	0.1159	0.010	AVRG	2.6
1,1-Dichloroethene	0.530	0.6047	0.010	AVRG	14.1
Bromoethane	0.280	0.2894	0.010	AVRG	3.4
Iodomethane	0.512	0.4851	0.010	AVRG	-5.2
Methylene Chloride	10.000	10.904	0.010	LINR	9.0
Acrylonitrile	0.186	0.1769	0.010	AVRG	-4.9
Carbon Disulfide	1.983	2.1503	0.010	AVRG	8.4
Trans-1,2-Dichloroethene	0.633	0.6723	0.010	AVRG	6.2
Vinyl Acetate	0.213	0.1951	0.010	AVRG	-8.4
1,1-Dichloroethane	1.058	1.1282	0.100	AVRG	6.6
2-Butanone	0.216	0.2145	0.010	AVRG	-0.7
2,2-Dichloropropane	0.814	0.8132	0.010	AVRG	-0.1
Cis-1,2-Dichloroethene	0.642	0.7036	0.010	AVRG	9.6
Chloroform	0.964	1.0221	0.010	AVRG	6.0
Bromochloromethane	0.274	0.2979	0.010	AVRG	8.7
1,1,1-Trichloroethane	0.807	0.8524	0.010	AVRG	5.6
1,1-Dichloropropene	0.464	0.4725	0.010	AVRG	1.8
Carbon Tetrachloride	0.355	0.3682	0.010	AVRG	3.7
1,2-Dichloroethane	0.374	0.3706	0.010	AVRG	-0.9
Benzene	1.379	1.4198	0.010	AVRG	3.0
Trichloroethene	0.333	0.3332	0.010	AVRG	0.1
1,2-Dichloropropane	0.353	0.3561	0.010	AVRG	0.9
Bromodichloromethane	0.396	0.4016	0.010	AVRG	1.4
Dibromomethane	0.173	0.1735	0.010	AVRG	0.3
2-Chloroethyl Vinyl Ether	0.199	0.2016	0.010	AVRG	1.3
4-Methyl-2-Pentanone	0.261	0.2720	0.010	AVRG	4.2
Cis 1,3-dichloropropene	0.534	0.5435	0.010	AVRG	1.8
Toluene	0.889	0.9180	0.010	AVRG	3.3
Trans 1,3-Dichloropropene	0.469	0.4687	0.010	AVRG	-0.1
2-Hexanone	0.194	0.2019	0.010	AVRG	4.1

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOENGINEERS

ARI Job No: ZP15 — Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 — Cont. Calib. Date: 12/23/14

Init. Calib. Date: 12/17/14 — Cont. Calib. Time: 0941

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
1,1,2-Trichloroethane	0.268	0.2690	0.010	AVRG	0.4
1,3-Dichloropropane	0.560	0.5490	0.010	AVRG	-2.0
Tetrachloroethene	0.330	0.3306	0.010	AVRG	0.2
Chlorodibromomethane	0.289	0.3007	0.010	AVRG	4.0
1,2-Dibromoethane	0.262	0.2664	0.010	AVRG	1.7
Chlorobenzene	1.073	1.0094	0.300	AVRG	-5.9
Ethyl Benzene	1.736	1.8088	0.010	AVRG	4.2
1,1,1,2-Tetrachloroethane	0.308	0.3203	0.010	AVRG	4.0
m,p-xylene	0.680	0.7028	0.010	AVRG	3.4
o-Xylene	0.681	0.6904	0.010	AVRG	1.4
Styrene	1.085	1.1574	0.010	AVRG	6.7
Bromoform	0.315	0.3092	0.100	AVRG	-1.8
1,1,2,2-Tetrachloroethane	0.750	0.7176	0.300	AVRG	-4.3
1,2,3-Trichloropropane	0.219	0.2066	0.010	AVRG	-5.7
Trans-1,4-Dichloro 2-Butene	0.210	0.2002	0.010	AVRG	-4.7
N-Propyl Benzene	3.625	3.8675	0.010	AVRG	6.7
Bromobenzene	0.742	0.7345	0.010	AVRG	-1.0
Isopropyl Benzene	3.207	3.2912	0.010	AVRG	2.6
2-Chloro Toluene	2.291	2.4530	0.010	AVRG	7.1
4-Chloro Toluene	2.427	2.4813	0.010	AVRG	2.2
T-Butyl Benzene	2.149	2.2278	0.010	AVRG	3.7
1,3,5-Trimethyl Benzene	2.595	2.6852	0.010	AVRG	3.5
1,2,4-Trimethylbenzene	2.635	2.7059	0.010	AVRG	2.7
S-Butyl Benzene	3.046	3.1949	0.010	AVRG	4.9
4-Isopropyl Toluene	2.468	2.6078	0.010	AVRG	5.7
1,3-Dichlorobenzene	1.447	1.4671	0.010	AVRG	1.4
1,4-Dichlorobenzene	1.498	1.4985	0.010	AVRG	0.0
N-Butyl Benzene	2.280	2.3479	0.010	AVRG	3.0
1,2-Dichlorobenzene	1.418	1.3841	0.010	AVRG	-2.4
1,2-Dibromo 3-Chloropropane	0.124	0.1118	0.010	AVRG	-9.8
1,2,4-Trichlorobenzene	0.796	0.7164	0.010	AVRG	-10.0
Hexachloro 1,3-Butadiene	0.245	0.2054	0.010	AVRG	-16.2
Naphthalene	1.993	1.7724	0.010	AVRG	-11.1
1,2,3-Trichlorobenzene	0.673	0.5973	0.010	AVRG	-11.2
Dichlorodifluoromethane	0.490	0.5205	0.010	AVRG	6.2
Methyl tert butyl ether	1.665	1.7267	0.010	AVRG	3.7

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Instrument ID: NT3 Cont. Calib. Date: 12/23/14

Init. Calib. Date: 12/17/14 Cont. Calib. Time: 0941

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.533	0.5499	0.010	AVRG	3.2
d8-Toluene	1.240	1.2389	0.010	AVRG	-0.1
4-Bromofluorobenzene	0.511	0.5110	0.010	AVRG	0.0
d4-1,2-Dichlorobenzene	0.914	0.8956	0.010	AVRG	-2.0
Dibromofluoromethane	0.487	0.5086	0.010	AVRG	4.4

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Cont. Calib. Date: 12/23/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 0808

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	1.014	0.8198	0.100	AVRG	-19.2	
Vinyl Chloride	0.942	0.8135	0.010	AVRG	-13.6	
Bromomethane	50.000	48.670	0.010	LINR	-2.7	
Chloroethane	0.610	0.4933	0.010	AVRG	-19.1	
Trichlorofluoromethane	1.109	1.1184	0.010	AVRG	0.8	
Acrolein	0.128	0.0955	0.010	AVRG	-25.4	<-
112Trichloro122Trifluoroetha	0.626	0.6351	0.010	AVRG	1.4	
Acetone	250.00	190.39	0.010	2ORDR	-23.8	<-
1,1-Dichloroethene	0.612	0.5884	0.010	AVRG	-3.8	
Bromoethane	0.414	0.4290	0.010	AVRG	3.6	
Iodomethane	50.000	43.092	0.010	LINR	-13.8	
Methylene Chloride	0.756	0.6326	0.010	AVRG	-16.3	
Acrylonitrile	0.287	0.2199	0.010	AVRG	-23.4	<-
Carbon Disulfide	2.064	1.9259	0.010	AVRG	-6.7	
Trans-1,2-Dichloroethene	0.713	0.7065	0.010	AVRG	-0.9	
Vinyl Acetate	0.366	0.2661	0.010	AVRG	-27.3	<-
1,1-Dichloroethane	1.444	1.2901	0.100	AVRG	-10.6	
2-Butanone	0.080	0.0610	0.010	AVRG	-23.8	<-
2,2-Dichloropropane	1.104	1.1292	0.010	AVRG	2.3	
Cis-1,2-Dichloroethene	0.802	0.6979	0.010	AVRG	-13.0	
Chloroform	1.238	1.1524	0.010	AVRG	-6.9	
Bromochloromethane	0.348	0.3239	0.010	AVRG	-6.9	
1,1,1-Trichloroethane	1.156	1.1789	0.010	AVRG	2.0	
1,1-Dichloropropene	0.424	0.4721	0.010	AVRG	11.3	
Carbon Tetrachloride	0.394	0.4920	0.010	AVRG	24.9	<-
1,2-Dichloroethane	0.371	0.4074	0.010	AVRG	9.8	
Benzene	1.205	1.2299	0.010	AVRG	2.1	
Trichloroethene	0.306	0.3283	0.010	AVRG	7.3	
1,2-Dichloropropane	0.326	0.3548	0.010	AVRG	8.8	
Bromodichloromethane	0.375	0.4313	0.010	AVRG	15.0	
Dibromomethane	0.157	0.1710	0.010	AVRG	8.9	
2-Chloroethyl Vinyl Ether	0.189	0.1422	0.010	AVRG	-24.8	<-
4-Methyl-2-Pentanone	0.134	0.1305	0.010	AVRG	-2.6	
Cis 1,3-dichloropropene	0.477	0.5429	0.010	AVRG	13.8	
Toluene	0.847	0.9617	0.010	AVRG	13.5	
Trans 1,3-Dichloropropene	0.418	0.4779	0.010	AVRG	14.3	
2-Hexanone	0.200	0.1858	0.010	AVRG	-7.1	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Cont. Calib. Date: 12/23/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 0808

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
1,1,2-Trichloroethane	0.255	0.2726	0.010	AVRG	6.9	
1,3-Dichloropropane	0.394	0.4146	0.010	AVRG	5.2	
Tetrachloroethene	0.290	0.3392	0.010	AVRG	17.0	
Chlorodibromomethane	0.240	0.2824	0.010	AVRG	17.7	
1,2-Dibromoethane	0.248	0.2778	0.010	AVRG	12.0	
Chlorobenzene	0.802	0.8815	0.300	AVRG	9.9	
Ethyl Benzene	1.414	1.5497	0.010	AVRG	9.6	
1,1,1,2-Tetrachloroethane	0.262	0.3102	0.010	AVRG	18.4	
m,p-xylene	0.561	0.6139	0.010	AVRG	9.4	
o-Xylene	0.542	0.5846	0.010	AVRG	7.8	
Styrene	0.870	0.9495	0.010	AVRG	9.1	
Bromoform	0.277	0.3256	0.100	AVRG	17.5	
1,1,2,2-Tetrachloroethane	0.529	0.5378	0.300	AVRG	1.7	
1,2,3-Trichloropropane	0.175	0.1798	0.010	AVRG	2.7	
Trans-1,4-Dichloro 2-Butene	0.148	0.1533	0.010	AVRG	3.6	
N-Propyl Benzene	3.022	3.3167	0.010	AVRG	9.8	
Bromobenzene	0.595	0.6342	0.010	AVRG	6.6	
Isopropyl Benzene	2.673	2.9451	0.010	AVRG	10.2	
2-Chloro Toluene	1.795	1.9268	0.010	AVRG	7.3	
4-Chloro Toluene	1.868	2.0250	0.010	AVRG	8.4	
T-Butyl Benzene	1.968	2.2004	0.010	AVRG	11.8	
1,3,5-Trimethyl Benzene	2.219	2.4695	0.010	AVRG	11.3	
1,2,4-Trimethylbenzene	2.201	2.4286	0.010	AVRG	10.3	
S-Butyl Benzene	2.925	3.2719	0.010	AVRG	11.8	
4-Isopropyl Toluene	2.387	2.7241	0.010	AVRG	14.1	
1,3-Dichlorobenzene	1.179	1.2958	0.010	AVRG	9.9	
1,4-Dichlorobenzene	1.221	1.2971	0.010	AVRG	6.2	
N-Butyl Benzene	2.222	2.4600	0.010	AVRG	10.7	
1,2-Dichlorobenzene	1.125	1.1830	0.010	AVRG	5.2	
1,2-Dibromo 3-Chloropropane	0.092	0.1005	0.010	AVRG	9.2	
1,2,4-Trichlorobenzene	0.778	0.8375	0.010	AVRG	7.6	
Hexachloro 1,3-Butadiene	0.395	0.4488	0.010	AVRG	13.6	
Naphthalene	1.956	1.9484	0.010	AVRG	-0.4	
1,2,3-Trichlorobenzene	0.712	0.7410	0.010	AVRG	4.1	
Dichlorodifluoromethane	0.689	0.5282	0.010	AVRG	-23.3	<-
Methyl tert butyl ether	1.954	1.8572	0.010	AVRG	-5.0	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Instrument ID: NT5 Cont. Calib. Date: 12/23/14

Init. Calib. Date: 11/20/14 Cont. Calib. Time: 0808

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.729	0.6205	0.010	AVRG	-14.9
d8-Toluene	1.280	1.3328	0.010	AVRG	4.1
4-Bromofluorobenzene	0.514	0.5092	0.010	AVRG	-0.9
d4-1,2-Dichlorobenzene	0.945	0.9322	0.010	AVRG	-1.4
Dibromofluoromethane	0.687	0.5819	0.010	AVRG	-15.3

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: SCL0021CAL5 Ical Date: 12/17/14

Instrument ID: NT3 Project Run Date: 12/17/14

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	481627	4.76	847325	5.18	791316	7.46
	UPPER LIMIT	963254	5.26	1694650	5.68	1582632	7.96
	LOWER LIMIT	240814	4.26	423662	4.68	395658	6.96
	Sample ID						
01	ICV10	479321	4.76	861758	5.18	803697	7.46
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
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18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: SCL0021CAL5 Ical Date: 12/17/14

Instrument ID: NT3 Project Run Date: 12/17/14

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	410348	9.33				
	UPPER LIMIT	820696	9.83				
	LOWER LIMIT	205174	8.83				
	Sample ID						
01	ICV10	409506	9.32				
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
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20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: SCL0021CAL5 Ical Date: 12/17/14

Instrument ID: NT3 Project Run Date: 12/23/14

		IS1(PFB) AREA #	IS1(PFB) RT #	IS2(DFB) AREA #	IS2(DFB) RT #	IS3(CLB) AREA #	IS3(CLB) RT #
	ICAL MIDPT	481627	4.76	847325	5.18	791316	7.46
	UPPER LIMIT	963254	5.26	1694650	5.68	1582632	7.96
	LOWER LIMIT	240814	4.26	423662	4.68	395658	6.96
	Sample ID						
01	LCS1223	359845	4.76	654479	5.18	612560	7.46
02	LCS1223	362464	4.76	652396	5.18	613729	7.46
03	MB1223	357879	4.77	654670	5.18	614244	7.46
04	TRIP BLANK(1	360556	4.76	654504	5.18	609932	7.46
05	TRIP BLANK(2	356363	4.76	657851	5.18	615580	7.46
06	MW-36D-14121	355340	4.76	644770	5.18	611767	7.46
07	MW-36S-14121	361191	4.76	652892	5.18	616065	7.46
08							
09							
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22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP15 Project: GAS WORKS PARK-PLAY AREA

Ical Midpoint ID: SCL0021CAL5 Ical Date: 12/17/14

Instrument ID: NT3 Project Run Date: 12/23/14

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	410348	9.33				
	UPPER LIMIT	820696	9.83				
	LOWER LIMIT	205174	8.83				
	Sample ID						
01	LCS1223	314672	9.32				
02	LCS1223	320110	9.32				
03	MB1223	317255	9.32				
04	TRIP BLANK(1	312500	9.32				
05	TRIP BLANK(2	315228	9.32				
06	MW-36D-14121	321944	9.32				
07	MW-36S-14121	319281	9.32				
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IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Ical Midpoint ID: 0101120 Ical Date: 11/20/14

Instrument ID: NT5 Project Run Date: 11/20/14

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	278101	5.12	699590	5.56	830842	8.00
	UPPER LIMIT	556202	5.62	1399180	6.06	1661684	8.50
	LOWER LIMIT	139050	4.62	349795	5.06	415421	7.50
	Sample ID						
01	ICV1120	274481	5.11	695211	5.55	823689	8.00
02							
03							
04							
05							
06							
07							
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21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP16 | Project: GAS WORKS PARK

Ical Midpoint ID: 0101120 | Ical Date: 11/20/14

Instrument ID: NT5 | Project Run Date: 11/20/14

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	450241	10.09				
	UPPER LIMIT	900482	10.59				
	LOWER LIMIT	225120	9.59				
	Sample ID						
01	ICV1120	439864	10.10				
02							
03							
04							
05							
06							
07							
08							
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22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

ARI Job No: ZP16 Project: GAS WORKS PARK

Ical Midpoint ID: 0101120 Ical Date: 11/20/14

Instrument ID: NT5 Project Run Date: 12/23/14

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	278101	5.12	699590	5.56	830842	8.00
	UPPER LIMIT	556202	5.62	1399180	6.06	1661684	8.50
	LOWER LIMIT	139050	4.62	349795	5.06	415421	7.50
	Sample ID						
01	LCS1223	323993	5.10	755787	5.54	891500	8.00
02	LCS1223	337273	5.10	743468	5.54	877367	8.00
03	MB1223	330975	5.10	725983	5.54	846797	8.00
04	TRIP BLANK	338590	5.10	750224	5.54	903637	8.00
05	TRIP BLANK	338148	5.10	742084	5.54	890917	8.00
06	TRIP BLANKS	339834	5.10	747684	5.54	899415	8.00
07	PAI-9-12.5-1	322013	5.11	726128	5.55	878152	8.00
08	PAI-10-9.5-1	315283	5.11	705273	5.55	837662	8.00
09	PAI-8-14.5-1	322197	5.10	699771	5.54	820479	8.00
10	PAI-3-33.5-3	345917	5.11	750433	5.55	926207	8.00
11	PAI-9-12.5-1	328247	5.11	725686	5.55	864248	8.00
12	PAI-10-19.5-	325167	5.11	695596	5.55	817646	8.00
13	PAI-10-24.5-	325793	5.10	717146	5.55	830103	8.00
14	PAI-11-9.5-1	319802	5.11	705927	5.55	797679	8.00
15	PAI-11-18.0-	242357	5.11	539708	5.55	646144	8.00
16	PAI-4-16.0-1	343945	5.11	762135	5.55	926302	8.00
17	PAI-3-13.0-1	320448	5.11	742242	5.55	899857	8.00
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOENGINEERS

ARI Job No: ZP16 | Project: GAS WORKS PARK

Ical Midpoint ID: 0101120 | Ical Date: 11/20/14

Instrument ID: NT5 | Project Run Date: 12/23/14

		IS4 (DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	450241	10.09				
	UPPER LIMIT	900482	10.59				
	LOWER LIMIT	225120	9.59				
	Sample ID						
01	LCS1223	477360	10.08				
02	LCS1223	478264	10.08				
03	MB1223	445627	10.08				
04	TRIP BLANK	482879	10.08				
05	TRIP BLANK	477074	10.08				
06	TRIP BLANKS	482745	10.08				
07	PAI-9-12.5-1	472425	10.08				
08	PAI-10-9.5-1	447111	10.08				
09	PAI-8-14.5-1	437643	10.09				
10	PAI-3-33.5-3	502089	10.09				
11	PAI-9-12.5-1	464100	10.09				
12	PAI-10-19.5-	429299	10.08				
13	PAI-10-24.5-	452451	10.08				
14	PAI-11-9.5-1	420068	10.08				
15	PAI-11-18.0-	344831	10.08				
16	PAI-4-16.0-1	503028	10.08				
17	PAI-3-13.0-1	485522	10.08				
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

SIM PAH Analysis
Report and Summary QC Forms

ARI Job ID: ZP15, ZP16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36D-141215**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: ZP15A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 17:32
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**0.30**	**1.0**	**800 ES**
208-96-8	**Acenaphthylene**	**0.38**	**1.0**	**15**
83-32-9	**Acenaphthene**	**0.30**	**1.0**	**35**
86-73-7	**Fluorene**	**0.28**	**1.0**	**16**
85-01-8	**Phenanthrene**	**0.28**	**1.0**	**27**
120-12-7	**Anthracene**	**0.35**	**1.0**	**5.2**
206-44-0	**Fluoranthene**	**0.35**	**1.0**	**5.3**
129-00-0	**Pyrene**	**0.43**	**1.0**	**3.9**
56-55-3	Benzo(a)anthracene	0.40	1.0	< 1.0 U
218-01-9	Chrysene	0.32	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.42	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.43	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.43	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.42	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.54	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.39	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.41	1.0	< 1.0 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	66.7%
d10-2-Methylnaphthalene	36.7%
d14-Dibenzo(a,h)anthracene	43.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36D-141215**
Extraction Method: SW3520C **DILUTION**

Lab Sample ID: ZP15A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 19:38
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 300

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**8.9**	**30**	**6,100 ES**
208-96-8	Acenaphthylene	11	30	< 30 U
83-32-9	**Acenaphthene**	**9.1**	**30**	**36**
86-73-7	**Fluorene**	**8.3**	**30**	**16 J**
85-01-8	**Phenanthrene**	**8.4**	**30**	**30 J**
120-12-7	Anthracene	11	30	< 30 U
206-44-0	Fluoranthene	10	30	< 30 U
129-00-0	Pyrene	13	30	< 30 U
56-55-3	Benzo(a)anthracene	12	30	< 30 U
218-01-9	Chrysene	9.6	30	< 30 U
205-99-2	Benzo(b)fluoranthene	13	30	< 30 U
207-08-9	Benzo(k)fluoranthene	13	30	< 30 U
50-32-8	Benzo(a)pyrene	13	30	< 30 U
193-39-5	Indeno(1,2,3-cd)pyrene	13	30	< 30 U
53-70-3	Dibenz(a,h)anthracene	16	30	< 30 U
191-24-2	Benzo(g,h,i)perylene	12	30	< 30 U
TOTBFA	Total Benzofluoranthenes	12	30	< 30 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36D-141215**
Extraction Method: SW3520C **DILUTION2**

Lab Sample ID: ZP15A
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/16/15 13:07
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 900

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**27**	**90**	**6,900**
208-96-8	Acenaphthylene	34	90	< 90 U
83-32-9	Acenaphthene	27	90	< 90 U
86-73-7	Fluorene	25	90	< 90 U
85-01-8	Phenanthrene	25	90	< 90 U
120-12-7	Anthracene	32	90	< 90 U
206-44-0	Fluoranthene	31	90	< 90 U
129-00-0	Pyrene	39	90	< 90 U
56-55-3	Benzo(a)anthracene	36	90	< 90 U
218-01-9	Chrysene	29	90	< 90 U
205-99-2	Benzo(b)fluoranthene	38	90	< 90 U
207-08-9	Benzo(k)fluoranthene	39	90	< 90 U
50-32-8	Benzo(a)pyrene	39	90	< 90 U
193-39-5	Indeno(1,2,3-cd)pyrene	38	90	< 90 U
53-70-3	Dibenz(a,h)anthracene	48	90	< 90 U
191-24-2	Benzo(g,h,i)perylene	35	90	< 90 U
TOTBFA	Total Benzofluoranthenes	37	90	< 90 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36S-141215**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: ZP15B
LIMS ID: 14-27519
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 17:57
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**0.30**	**1.0**	**970 ES**
208-96-8	**Acenaphthylene**	**0.38**	**1.0**	**31**
83-32-9	**Acenaphthene**	**0.30**	**1.0**	**12**
86-73-7	**Fluorene**	**0.28**	**1.0**	**14**
85-01-8	**Phenanthrene**	**0.28**	**1.0**	**20**
120-12-7	**Anthracene**	**0.35**	**1.0**	**3.4**
206-44-0	**Fluoranthene**	**0.35**	**1.0**	**4.1**
129-00-0	**Pyrene**	**0.43**	**1.0**	**3.2**
56-55-3	Benzo(a)anthracene	0.40	1.0	< 1.0 U
218-01-9	Chrysene	0.32	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.42	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.43	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.43	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.42	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.54	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.39	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.41	1.0	< 1.0 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	60.0%
d10-2-Methylnaphthalene	40.0%
d14-Dibenzo(a,h)anthracene	46.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36S-141215**
Extraction Method: SW3520C **DILUTION**

Lab Sample ID: ZP15B
LIMS ID: 14-27519
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 20:03
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 300

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**8.9**	**30**	**5,300 E**
208-96-8	**Acenaphthylene**	**11**	**30**	**30 J**
83-32-9	Acenaphthene	9.1	30	< 30 U
86-73-7	Fluorene	8.3	30	< 30 U
85-01-8	**Phenanthrene**	**8.4**	**30**	**23 J**
120-12-7	Anthracene	11	30	< 30 U
206-44-0	Fluoranthene	10	30	< 30 U
129-00-0	Pyrene	13	30	< 30 U
56-55-3	Benzo(a)anthracene	12	30	< 30 U
218-01-9	Chrysene	9.6	30	< 30 U
205-99-2	Benzo(b)fluoranthene	13	30	< 30 U
207-08-9	Benzo(k)fluoranthene	13	30	< 30 U
50-32-8	Benzo(a)pyrene	13	30	< 30 U
193-39-5	Indeno(1,2,3-cd)pyrene	13	30	< 30 U
53-70-3	Dibenz(a,h)anthracene	16	30	< 30 U
191-24-2	Benzo(g,h,i)perylene	12	30	< 30 U
TOTBFA	Total Benzofluoranthenes	12	30	< 30 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36S-141215**
Extraction Method: SW3520C **DILUTION2**

Lab Sample ID: ZP15B
LIMS ID: 14-27519
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/16/15 13:32
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 900

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**27**	**90**	**5,800**
208-96-8	Acenaphthylene	34	90	< 90 U
83-32-9	Acenaphthene	27	90	< 90 U
86-73-7	Fluorene	25	90	< 90 U
85-01-8	Phenanthrene	25	90	< 90 U
120-12-7	Anthracene	32	90	< 90 U
206-44-0	Fluoranthene	31	90	< 90 U
129-00-0	Pyrene	39	90	< 90 U
56-55-3	Benzo(a)anthracene	36	90	< 90 U
218-01-9	Chrysene	29	90	< 90 U
205-99-2	Benzo(b)fluoranthene	38	90	< 90 U
207-08-9	Benzo(k)fluoranthene	39	90	< 90 U
50-32-8	Benzo(a)pyrene	39	90	< 90 U
193-39-5	Indeno(1,2,3-cd)pyrene	38	90	< 90 U
53-70-3	Dibenz(a,h)anthracene	48	90	< 90 U
191-24-2	Benzo(g,h,i)perylene	35	90	< 90 U
TOTBFA	Total Benzofluoranthenes	37	90	< 90 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36D-141215**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: ZP15E
LIMS ID: 14-27522
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Paly Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 18:22
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**0.30**	**1.0**	**780 ES**
208-96-8	**Acenaphthylene**	**0.38**	**1.0**	**13**
83-32-9	**Acenaphthene**	**0.30**	**1.0**	**34**
86-73-7	**Fluorene**	**0.28**	**1.0**	**15**
85-01-8	**Phenanthrene**	**0.28**	**1.0**	**25**
120-12-7	**Anthracene**	**0.35**	**1.0**	**4.4**
206-44-0	**Fluoranthene**	**0.35**	**1.0**	**4.3**
129-00-0	**Pyrene**	**0.43**	**1.0**	**3.1**
56-55-3	Benzo(a)anthracene	0.40	1.0	< 1.0 U
218-01-9	Chrysene	0.32	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.42	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.43	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.43	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.42	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.54	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.39	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.41	1.0	< 1.0 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	60.0%
d10-2-Methylnaphthalene	36.7%
d14-Dibenzo(a,h)anthracene	53.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36D-141215**
Extraction Method: SW3520C **DILUTION**

Lab Sample ID: ZP15E
LIMS ID: 14-27522
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Paly Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 20:29
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 300

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**8.9**	**30**	**5,600 E**
208-96-8	Acenaphthylene	11	30	< 30 U
83-32-9	**Acenaphthene**	**9.1**	**30**	**32**
86-73-7	Fluorene	8.3	30	< 30 U
85-01-8	**Phenanthrene**	**8.4**	**30**	**27 J**
120-12-7	Anthracene	11	30	< 30 U
206-44-0	Fluoranthene	10	30	< 30 U
129-00-0	Pyrene	13	30	< 30 U
56-55-3	Benzo(a)anthracene	12	30	< 30 U
218-01-9	Chrysene	9.6	30	< 30 U
205-99-2	Benzo(b)fluoranthene	13	30	< 30 U
207-08-9	Benzo(k)fluoranthene	13	30	< 30 U
50-32-8	Benzo(a)pyrene	13	30	< 30 U
193-39-5	Indeno(1,2,3-cd)pyrene	13	30	< 30 U
53-70-3	Dibenz(a,h)anthracene	16	30	< 30 U
191-24-2	Benzo(g,h,i)perylene	12	30	< 30 U
TOTBFA	Total Benzofluoranthenes	12	30	< 30 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36D-141215**
Extraction Method: SW3520C **DILUTION2**

Lab Sample ID: ZP15E
LIMS ID: 14-27522
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Paly Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/16/15 13:57
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 900

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**27**	**90**	**6,300**
208-96-8	Acenaphthylene	34	90	< 90 U
83-32-9	Acenaphthene	27	90	< 90 U
86-73-7	Fluorene	25	90	< 90 U
85-01-8	Phenanthrene	25	90	< 90 U
120-12-7	Anthracene	32	90	< 90 U
206-44-0	Fluoranthene	31	90	< 90 U
129-00-0	Pyrene	39	90	< 90 U
56-55-3	Benzo(a)anthracene	36	90	< 90 U
218-01-9	Chrysene	29	90	< 90 U
205-99-2	Benzo(b)fluoranthene	38	90	< 90 U
207-08-9	Benzo(k)fluoranthene	39	90	< 90 U
50-32-8	Benzo(a)pyrene	39	90	< 90 U
193-39-5	Indeno(1,2,3-cd)pyrene	38	90	< 90 U
53-70-3	Dibenz(a,h)anthracene	48	90	< 90 U
191-24-2	Benzo(g,h,i)perylene	35	90	< 90 U
TOTBFA	Total Benzofluoranthenes	37	90	< 90 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36S-141215**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: ZP15F
LIMS ID: 14-27523
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 18:47
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**0.30**	**1.0**	**940 ES**
208-96-8	**Acenaphthylene**	**0.38**	**1.0**	**32**
83-32-9	**Acenaphthene**	**0.30**	**1.0**	**12**
86-73-7	**Fluorene**	**0.28**	**1.0**	**13**
85-01-8	**Phenanthrene**	**0.28**	**1.0**	**18**
120-12-7	**Anthracene**	**0.35**	**1.0**	**2.8**
206-44-0	**Fluoranthene**	**0.35**	**1.0**	**2.6**
129-00-0	**Pyrene**	**0.43**	**1.0**	**1.9**
56-55-3	Benzo(a)anthracene	0.40	1.0	< 1.0 U
218-01-9	Chrysene	0.32	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.42	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.43	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.43	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.42	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.54	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.39	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.41	1.0	< 1.0 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	66.7%
d10-2-Methylnaphthalene	43.3%
d14-Dibenzo(a,h)anthracene	43.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36S-141215**
Extraction Method: SW3520C **DILUTION**

Lab Sample ID: ZP15F
LIMS ID: 14-27523
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 20:54
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 300

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**8.9**	**30**	**5,200 E**
208-96-8	**Acenaphthylene**	**11**	**30**	**30 J**
83-32-9	Acenaphthene	9.1	30	< 30 U
86-73-7	Fluorene	8.3	30	< 30 U
85-01-8	**Phenanthrene**	**8.4**	**30**	**19 J**
120-12-7	Anthracene	11	30	< 30 U
206-44-0	Fluoranthene	10	30	< 30 U
129-00-0	Pyrene	13	30	< 30 U
56-55-3	Benzo(a)anthracene	12	30	< 30 U
218-01-9	Chrysene	9.6	30	< 30 U
205-99-2	Benzo(b)fluoranthene	13	30	< 30 U
207-08-9	Benzo(k)fluoranthene	13	30	< 30 U
50-32-8	Benzo(a)pyrene	13	30	< 30 U
193-39-5	Indeno(1,2,3-cd)pyrene	13	30	< 30 U
53-70-3	Dibenz(a,h)anthracene	16	30	< 30 U
191-24-2	Benzo(g,h,i)perylene	12	30	< 30 U
TOTBFA	Total Benzofluoranthenes	12	30	< 30 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MW-36S-141215**
Extraction Method: SW3520C **DILUTION2**

Lab Sample ID: ZP15F
LIMS ID: 14-27523
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/15/14
Date Received: 12/15/14

Date Extracted: 12/18/14
Date Analyzed: 01/16/15 14:22
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 900

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**27**	**90**	**5,100**
208-96-8	Acenaphthylene	34	90	< 90 U
83-32-9	Acenaphthene	27	90	< 90 U
86-73-7	Fluorene	25	90	< 90 U
85-01-8	Phenanthrene	25	90	< 90 U
120-12-7	Anthracene	32	90	< 90 U
206-44-0	Fluoranthene	31	90	< 90 U
129-00-0	Pyrene	39	90	< 90 U
56-55-3	Benzo(a)anthracene	36	90	< 90 U
218-01-9	Chrysene	29	90	< 90 U
205-99-2	Benzo(b)fluoranthene	38	90	< 90 U
207-08-9	Benzo(k)fluoranthene	39	90	< 90 U
50-32-8	Benzo(a)pyrene	39	90	< 90 U
193-39-5	Indeno(1,2,3-cd)pyrene	38	90	< 90 U
53-70-3	Dibenz(a,h)anthracene	48	90	< 90 U
191-24-2	Benzo(g,h,i)perylene	35	90	< 90 U
TOTBFA	Total Benzofluoranthenes	37	90	< 90 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520

Client ID	FLN	MNP	DBA	TOT OUT
MB-121814	70.7%	52.3%	72.0%	0
LCS-121814	74.7%	55.0%	70.3%	0
LCSD-121814	75.3%	56.0%	79.7%	0
MW-36D-141215	66.7%	36.7%	43.3%	0
MW-36D-141215 DL	D	D	D	0
MW-36D-141215 DL2	D	D	D	0
MW-36S-141215	60.0%	40.0%	46.7%	0
MW-36S-141215 DL	D	D	D	0
MW-36S-141215 DL2	D	D	D	0
MW-36D-141215	60.0%	36.7%	53.3%	0
MW-36D-141215 DL	D	D	D	0
MW-36D-141215 DL2	D	D	D	0
MW-36S-141215	66.7%	43.3%	43.3%	0
MW-36S-141215 DL	D	D	D	0
MW-36S-141215 DL2	d	D	D	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(46-121)	(46-121)
(MNP) = d10-2-Methylnaphthalene	(31-120)	(31-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(10-125)	(10-125)

Prep Method: SW3520C
Log Number Range: 14-27518 to 14-27523

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-9-12.5-13.0
SAMPLE

Lab Sample ID: ZP16A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/13/15 23:25
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 10.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**2.1**	**4.7**	**3,300 ESB**
208-96-8	**Acenaphthylene**	**1.5**	**4.7**	**37**
83-32-9	**Acenaphthene**	**1.4**	**4.7**	**95**
86-73-7	**Fluorene**	**1.4**	**4.7**	**290**
85-01-8	**Phenanthrene**	**1.5**	**4.7**	**760 E**
120-12-7	**Anthracene**	**1.7**	**4.7**	**180**
206-44-0	**Fluoranthene**	**1.7**	**4.7**	**270**
129-00-0	**Pyrene**	**2.1**	**4.7**	**240**
56-55-3	**Benzo(a)anthracene**	**2.1**	**4.7**	**17**
218-01-9	**Chrysene**	**1.8**	**4.7**	**18**
205-99-2	**Benzo(b)fluoranthene**	**2.0**	**4.7**	**8.6**
207-08-9	**Benzo(k)fluoranthene**	**2.1**	**4.7**	**4.9**
50-32-8	**Benzo(a)pyrene**	**2.2**	**4.7**	**14**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**2.8**	**4.7**	**7.1**
53-70-3	Dibenz(a,h)anthracene	2.4	4.7	< 4.7 U
191-24-2	**Benzo(g,h,i)perylene**	**2.6**	**4.7**	**10**
TOTBFA	**Total Benzofluoranthenes**	**2.1**	**4.7**	**18**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	58.0%
d10-2-Methylnaphthalene	46.7%
d14-Dibenzo(a,h)anthracen	68.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546

Sample ID: PAI-9-12.5-13.0
DILUTION

Lab Sample ID: ZP16A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 13:04
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 20.0
Percent Moisture: 10.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**42**	**93**	**9,600 EB**
208-96-8	**Acenaphthylene**	**30**	**93**	**50 J**
83-32-9	**Acenaphthene**	**28**	**93**	**100**
86-73-7	**Fluorene**	**27**	**93**	**320**
85-01-8	**Phenanthrene**	**29**	**93**	**1,100**
120-12-7	**Anthracene**	**33**	**93**	**200**
206-44-0	**Fluoranthene**	**35**	**93**	**330**
129-00-0	**Pyrene**	**42**	**93**	**290**
56-55-3	Benzo(a)anthracene	41	93	< 93 U
218-01-9	Chrysene	36	93	< 93 U
205-99-2	Benzo(b)fluoranthene	39	93	< 93 U
207-08-9	Benzo(k)fluoranthene	42	93	< 93 U
50-32-8	Benzo(a)pyrene	44	93	< 93 U
193-39-5	Indeno(1,2,3-cd)pyrene	56	93	< 93 U
53-70-3	Dibenz(a,h)anthracene	48	93	< 93 U
191-24-2	Benzo(g,h,i)perylene	52	93	< 93 U
TOTBFA	Total Benzofluoranthenes	42	93	< 93 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-9-12.5-13.0
DILUTION2

Lab Sample ID: ZP16A
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 15:10
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 30.0
Percent Moisture: 10.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**63**	**140**	**11,000**
208-96-8	Acenaphthylene	45	140	< 140 U
83-32-9	**Acenaphthene**	**42**	**140**	**120 J**
86-73-7	**Fluorene**	**41**	**140**	**350**
85-01-8	**Phenanthrene**	**44**	**140**	**1,200**
120-12-7	**Anthracene**	**50**	**140**	**200**
206-44-0	**Fluoranthene**	**52**	**140**	**350**
129-00-0	**Pyrene**	**63**	**140**	**290**
56-55-3	Benzo(a)anthracene	62	140	< 140 U
218-01-9	Chrysene	54	140	< 140 U
205-99-2	Benzo(b)fluoranthene	59	140	< 140 U
207-08-9	Benzo(k)fluoranthene	64	140	< 140 U
50-32-8	Benzo(a)pyrene	67	140	< 140 U
193-39-5	Indeno(1,2,3-cd)pyrene	84	140	< 140 U
53-70-3	Dibenz(a,h)anthracene	72	140	< 140 U
191-24-2	Benzo(g,h,i)perylene	78	140	< 140 U
TOTBFA	Total Benzofluoranthenes	64	140	< 140 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-9-12.5-13-DUP SAMPLE

Lab Sample ID: ZP16B
LIMS ID: 14-27410
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat 0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/13/15 23:50
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 10.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.1	4.6	3,500 ESB
208-96-8	Acenaphthylene	1.5	4.6	62
83-32-9	Acenaphthene	1.4	4.6	160
86-73-7	Fluorene	1.4	4.6	560 E
85-01-8	Phenanthrene	1.5	4.6	1,500 ES
120-12-7	Anthracene	1.6	4.6	480 E
206-44-0	Fluoranthene	1.7	4.6	760 E
129-00-0	Pyrene	2.1	4.6	720 E
56-55-3	Benzo(a)anthracene	2.1	4.6	56
218-01-9	Chrysene	1.8	4.6	58
205-99-2	Benzo(b)fluoranthene	2.0	4.6	23
207-08-9	Benzo(k)fluoranthene	2.1	4.6	13
50-32-8	Benzo(a)pyrene	2.2	4.6	37
193-39-5	Indeno(1,2,3-cd)pyrene	2.8	4.6	19
53-70-3	Dibenz(a,h)anthracene	2.4	4.6	4.5 J
191-24-2	Benzo(g,h,i)perylene	2.6	4.6	26
TOTBFA	Total Benzofluoranthenes	2.1	4.6	50

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	75.7%
d10-2-Methylnaphthalene	62.7%
d14-Dibenzo(a,h)anthracen	87.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-9-12.5-13-DUP
DILUTION

Lab Sample ID: ZP16B
LIMS ID: 14-27410
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 13:29
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 20.0
Percent Moisture: 10.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**42**	**93**	**7,600 B**
208-96-8	**Acenaphthylene**	**30**	**93**	**69 J**
83-32-9	**Acenaphthene**	**28**	**93**	**170**
86-73-7	**Fluorene**	**27**	**93**	**590**
85-01-8	**Phenanthrene**	**29**	**93**	**2,600**
120-12-7	**Anthracene**	**33**	**93**	**530**
206-44-0	**Fluoranthene**	**35**	**93**	**940**
129-00-0	**Pyrene**	**42**	**93**	**860**
56-55-3	**Benzo(a)anthracene**	**41**	**93**	**56 J**
218-01-9	**Chrysene**	**36**	**93**	**55 J**
205-99-2	Benzo(b)fluoranthene	39	93	< 93 U
207-08-9	Benzo(k)fluoranthene	42	93	< 93 U
50-32-8	Benzo(a)pyrene	44	93	< 93 U
193-39-5	Indeno(1,2,3-cd)pyrene	56	93	< 93 U
53-70-3	Dibenz(a,h)anthracene	47	93	< 93 U
191-24-2	Benzo(g,h,i)perylene	52	93	< 93 U
TOTBFA	Total Benzofluoranthenes	42	93	< 93 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546

Sample ID: PAI-10-9.5-10.0
SAMPLE

Lab Sample ID: ZP16C
LIMS ID: 14-27411
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 00:16
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 0.59 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00
Percent Moisture: 42.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	110	250	530,000 ESB
208-96-8	Acenaphthylene	82	250	25,000 E
83-32-9	Acenaphthene	76	250	79,000 ES
86-73-7	Fluorene	75	250	52,000 ES
85-01-8	Phenanthrene	80	250	120,000 ES
120-12-7	Anthracene	91	250	47,000 E
206-44-0	Fluoranthene	95	250	100,000 ES
129-00-0	Pyrene	110	250	120,000 ES
56-55-3	Benzo(a)anthracene	110	250	68,000 ES
218-01-9	Chrysene	98	250	79,000 ES
205-99-2	Benzo(b)fluoranthene	110	250	70,000 ES
207-08-9	Benzo(k)fluoranthene	120	250	40,000 E
50-32-8	Benzo(a)pyrene	120	250	91,000 ES
193-39-5	Indeno(1,2,3-cd)pyrene	150	250	79,000 ES
53-70-3	Dibenz(a,h)anthracene	130	250	19,000
191-24-2	Benzo(g,h,i)perylene	140	250	110,000 ES
TOTBFA	Total Benzofluoranthenes	120	250	150,000 ES

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	59.0%
d10-2-Methylnaphthalene	98.0%
d14-Dibenzo(a,h)anthracen	59.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-10-9.5-10.0
DILUTION

Lab Sample ID: ZP16C
LIMS ID: 14-27411
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 13:54
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 0.59 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 300
Percent Moisture: 42.7 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**11000**	**25,000**	**4,800,000 E**
208-96-8	**Acenaphthylene**	**8200**	**25,000**	**36,000**
83-32-9	**Acenaphthene**	**7600**	**25,000**	**180,000**
86-73-7	**Fluorene**	**7500**	**25,000**	**99,000**
85-01-8	**Phenanthrene**	**8000**	**25,000**	**420,000**
120-12-7	**Anthracene**	**9100**	**25,000**	**84,000**
206-44-0	**Fluoranthene**	**9500**	**25,000**	**290,000**
129-00-0	**Pyrene**	**11000**	**25,000**	**280,000**
56-55-3	**Benzo(a)anthracene**	**11000**	**25,000**	**85,000**
218-01-9	**Chrysene**	**9800**	**25,000**	**95,000**
205-99-2	**Benzo(b)fluoranthene**	**11000**	**25,000**	**73,000**
207-08-9	**Benzo(k)fluoranthene**	**12000**	**25,000**	**40,000**
50-32-8	**Benzo(a)pyrene**	**12000**	**25,000**	**110,000**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**15000**	**25,000**	**72,000**
53-70-3	Dibenz(a,h)anthracene	13000	25,000	< 25,000 U
191-24-2	**Benzo(g,h,i)perylene**	**14000**	**25,000**	**110,000**
TOTBFA	**Total Benzofluoranthenes**	**12000**	**25,000**	**150,000**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
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Sample ID: PAI-10-9.5-10.0
DILUTION2

Lab Sample ID: ZP16C
LIMS ID: 14-27411
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 15:35
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 0.59 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 900
Percent Moisture: 42.7 %

CAS Number	Analyte	DL	LOQ	Result	
91-20-3	**Naphthalene**	**34000**	**76,000**	**5,600,000**	
208-96-8	Acenaphthylene	25000	76,000	< 76,000	U
83-32-9	**Acenaphthene**	**23000**	**76,000**	**170,000**	
86-73-7	**Fluorene**	**22000**	**76,000**	**98,000**	
85-01-8	**Phenanthrene**	**24000**	**76,000**	**400,000**	
120-12-7	**Anthracene**	**27000**	**76,000**	**76,000**	
206-44-0	**Fluoranthene**	**29000**	**76,000**	**280,000**	
129-00-0	**Pyrene**	**34000**	**76,000**	**260,000**	
56-55-3	**Benzo(a)anthracene**	**34000**	**76,000**	**79,000**	
218-01-9	**Chrysene**	**29000**	**76,000**	**85,000**	
205-99-2	**Benzo(b)fluoranthene**	**32000**	**76,000**	**67,000**	**J**
207-08-9	**Benzo(k)fluoranthene**	**35000**	**76,000**	**37,000**	**J**
50-32-8	**Benzo(a)pyrene**	**36000**	**76,000**	**100,000**	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**46000**	**76,000**	**69,000**	**J**
53-70-3	Dibenz(a,h)anthracene	39000	76,000	< 76,000	U
191-24-2	**Benzo(g,h,i)perylene**	**43000**	**76,000**	**100,000**	
TOTBFA	**Total Benzofluoranthenes**	**35000**	**76,000**	**140,000**	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
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Sample ID: PAI-10-19.5-20.0
SAMPLE

Lab Sample ID: ZP16D
LIMS ID: 14-27412
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 00:41
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 21.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	2.2	4.9	4,200 ESB
208-96-8	Acenaphthylene	1.6	4.9	570 E
83-32-9	Acenaphthene	1.4	4.9	1,900 ES
86-73-7	Fluorene	1.4	4.9	1,100 ES
85-01-8	Phenanthrene	1.5	4.9	930 E
120-12-7	Anthracene	1.7	4.9	460
206-44-0	Fluoranthene	1.8	4.9	1,100 ES
129-00-0	Pyrene	2.2	4.9	980 ES
56-55-3	Benzo(a)anthracene	2.2	4.9	130
218-01-9	Chrysene	1.9	4.9	160
205-99-2	Benzo(b)fluoranthene	2.1	4.9	70
207-08-9	Benzo(k)fluoranthene	2.2	4.9	35
50-32-8	Benzo(a)pyrene	2.3	4.9	76
193-39-5	Indeno(1,2,3-cd)pyrene	2.9	4.9	31
53-70-3	Dibenz(a,h)anthracene	2.5	4.9	6.8
191-24-2	Benzo(g,h,i)perylene	2.7	4.9	45
TOTBFA	Total Benzofluoranthenes	2.2	4.9	140

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	55.0%
d10-2-Methylnaphthalene	49.3%
d14-Dibenzo(a,h)anthracen	17.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
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Sample ID: PAI-10-19.5-20.0
DILUTION

Lab Sample ID: ZP16D
LIMS ID: 14-27412
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 14:20
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 30.0
Percent Moisture: 21.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**66**	**150**	**19,000 EB**
208-96-8	**Acenaphthylene**	**47**	**150**	**720**
83-32-9	**Acenaphthene**	**43**	**150**	**3,300**
86-73-7	**Fluorene**	**43**	**150**	**1,500**
85-01-8	**Phenanthrene**	**46**	**150**	**1,400**
120-12-7	**Anthracene**	**52**	**150**	**530**
206-44-0	**Fluoranthene**	**55**	**150**	**1,800**
129-00-0	**Pyrene**	**66**	**150**	**1,500**
56-55-3	**Benzo(a)anthracene**	**65**	**150**	**130 J**
218-01-9	**Chrysene**	**56**	**150**	**170**
205-99-2	**Benzo(b)fluoranthene**	**62**	**150**	**76 J**
207-08-9	Benzo(k)fluoranthene	67	150	< 150 U
50-32-8	**Benzo(a)pyrene**	**69**	**150**	**76 J**
193-39-5	Indeno(1,2,3-cd)pyrene	88	150	< 150 U
53-70-3	Dibenz(a,h)anthracene	75	150	< 150 U
191-24-2	Benzo(g,h,i)perylene	81	150	< 150 U
TOTBFA	**Total Benzofluoranthenes**	**67**	**150**	**120 J**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-10-19.5-20.0
DILUTION2

Lab Sample ID: ZP16D
LIMS ID: 14-27412
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 16:01
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 90.0
Percent Moisture: 21.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**200**	**440**	**20,000**
208-96-8	**Acenaphthylene**	**140**	**440**	**730**
83-32-9	**Acenaphthene**	**130**	**440**	**3,200**
86-73-7	**Fluorene**	**130**	**440**	**1,500**
85-01-8	**Phenanthrene**	**140**	**440**	**1,400**
120-12-7	**Anthracene**	**160**	**440**	**550**
206-44-0	**Fluoranthene**	**160**	**440**	**1,700**
129-00-0	**Pyrene**	**200**	**440**	**1,400**
56-55-3	Benzo(a)anthracene	190	440	< 440 U
218-01-9	Chrysene	170	440	< 440 U
205-99-2	Benzo(b)fluoranthene	180	440	< 440 U
207-08-9	Benzo(k)fluoranthene	200	440	< 440 U
50-32-8	Benzo(a)pyrene	210	440	< 440 U
193-39-5	Indeno(1,2,3-cd)pyrene	260	440	< 440 U
53-70-3	Dibenz(a,h)anthracene	220	440	< 440 U
191-24-2	Benzo(g,h,i)perylene	240	440	< 440 U
TOTBFA	Total Benzofluoranthenes	200	440	< 440 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546

Sample ID: PAI-10-24.5-25.0
SAMPLE

Lab Sample ID: ZP16E
LIMS ID: 14-27413
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 12:38
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 30.0
Percent Moisture: 30.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	65	140	94,000 ESB
208-96-8	Acenaphthylene	46	140	5,100
83-32-9	Acenaphthene	43	140	9,000
86-73-7	Fluorene	42	140	9,800
85-01-8	Phenanthrene	45	140	18,000 E
120-12-7	Anthracene	51	140	3,900
206-44-0	Fluoranthene	54	140	6,100
129-00-0	Pyrene	65	140	5,600
56-55-3	Benzo(a)anthracene	64	140	1,200
218-01-9	Chrysene	55	140	1,300
205-99-2	Benzo(b)fluoranthene	61	140	650
207-08-9	Benzo(k)fluoranthene	65	140	380
50-32-8	Benzo(a)pyrene	68	140	880
193-39-5	Indeno(1,2,3-cd)pyrene	86	140	390
53-70-3	Dibenz(a,h)anthracene	73	140	90 J
191-24-2	Benzo(g,h,i)perylene	80	140	500
TOTBFA	Total Benzofluoranthenes	65	140	1,400

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: PAI-10-24.5-25.0
DILUTION

Lab Sample ID: ZP16E
LIMS ID: 14-27413
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 14:45
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 900
Percent Moisture: 30.4 %

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**1900**	**4,300**	**270,000**
208-96-8	**Acenaphthylene**	**1400**	**4,300**	**5,200**
83-32-9	**Acenaphthene**	**1300**	**4,300**	**11,000**
86-73-7	**Fluorene**	**1300**	**4,300**	**11,000**
85-01-8	**Phenanthrene**	**1400**	**4,300**	**22,000**
120-12-7	**Anthracene**	**1500**	**4,300**	**3,700 J**
206-44-0	**Fluoranthene**	**1600**	**4,300**	**6,500**
129-00-0	**Pyrene**	**1900**	**4,300**	**6,100**
56-55-3	Benzo(a)anthracene	1900	4,300	< 4,300 U
218-01-9	Chrysene	1700	4,300	< 4,300 U
205-99-2	Benzo(b)fluoranthene	1800	4,300	< 4,300 U
207-08-9	Benzo(k)fluoranthene	2000	4,300	< 4,300 U
50-32-8	Benzo(a)pyrene	2000	4,300	< 4,300 U
193-39-5	Indeno(1,2,3-cd)pyrene	2600	4,300	< 4,300 U
53-70-3	Dibenz(a,h)anthracene	2200	4,300	< 4,300 U
191-24-2	Benzo(g,h,i)perylene	2400	4,300	< 4,300 U
TOTBFA	Total Benzofluoranthenes	2000	4,300	< 4,300 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracen	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: RINSATE-141211**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: ZP16V
LIMS ID: 14-27430
Matrix: Water
Data Release Authorized:
Reported: 01/16/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: 12/11/14
Date Received: 12/11/14

Date Extracted: 12/18/14
Date Analyzed: 01/15/15 17:06
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**0.030**	**0.10**	**0.29**
208-96-8	Acenaphthylene	0.038	0.10	< 0.10 U
83-32-9	Acenaphthene	0.030	0.10	< 0.10 U
86-73-7	Fluorene	0.028	0.10	< 0.10 U
85-01-8	Phenanthrene	0.028	0.10	< 0.10 U
120-12-7	Anthracene	0.035	0.10	< 0.10 U
206-44-0	Fluoranthene	0.035	0.10	< 0.10 U
129-00-0	Pyrene	0.043	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.040	0.10	< 0.10 U
218-01-9	Chrysene	0.032	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.042	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.043	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.043	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.054	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.039	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.041	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	69.0%
d10-2-Methylnaphthalene	50.3%
d14-Dibenzo(a,h)anthracene	75.3%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520

Client ID	FLN	MNP	DBA	TOT OUT
MB-122414	74.0%	50.3%	84.3%	0
LCS-122414	70.7%	55.3%	87.7%	0
LCSD-122414	71.7%	54.7%	88.3%	0
PAI-9-12.5-13.0	58.0%	46.7%	68.7%	0
PAI-9-12.5-13.0 DL	D D	D D	D D	0
PAI-9-12.5-13.0 DL2	D D	D D	D D	0
PAI-9-12.5-13-DUP	75.7%	62.7%	87.3%	0
PAI-9-12.5-13-DUP DL	D D	D D	D D	0
PAI-10-9.5-10.0	59.0%	98.0%	59.0%	0
PAI-10-9.5-10.0 DL	D D	D D	D D	0
PAI-10-9.5-10.0 DL2	D D	D D	D D	0
PAI-10-19.5-20.0	55.0%	49.3%	17.3% *	1
PAI-10-19.5-20.0 DL	D D	D D	D D	0
PAI-10-19.5-20.0 DL2	D D	D D	D D	0
PAI-10-24.5-25.0	D D	D D	D D	0
PAI-10-24.5-25.0 DL	D D	D D	D D	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(36-134)	(36-134)
(MNP) = d10-2-Methylnaphthalene	(32-120)	(32-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(21-133)	(21-133)

Prep Method: SW3546
Log Number Range: 14-27409 to 14-27413

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520

Client ID	FLN	MNP	DBA	TOT OUT
MB-121814	70.7%	52.3%	72.0%	0
LCS-121814	74.7%	55.0%	70.3%	0
LCSD-121814	75.3%	56.0%	79.7%	0
RINSATE-141211	69.0%	50.3%	75.3%	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(46-121)	(46-121)
(MNP) = d10-2-Methylnaphthalene	(31-120)	(31-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(10-125)	(10-125)

Prep Method: SW3520C
Log Number Range: 14-27430 to 14-27430

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-121814
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121814
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 12/18/14

Date Analyzed LCS: 01/14/15 06:11
LCSD: 01/14/15 20:13
Instrument/Analyst LCS: NT8/JZ
LCSD: NT8/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	1.62	3.00	54.0%	1.62	3.00	54.0%	0.0%
Acenaphthylene	1.44	3.00	48.0%	1.48	3.00	49.3%	2.7%
Acenaphthene	1.62	3.00	54.0%	1.64	3.00	54.7%	1.2%
Fluorene	1.85	3.00	61.7%	1.85	3.00	61.7%	0.0%
Phenanthrene	2.10	3.00	70.0%	2.12	3.00	70.7%	0.9%
Anthracene	1.80	3.00	60.0%	1.99	3.00	66.3%	10.0%
Fluoranthene	2.16	3.00	72.0%	2.24	3.00	74.7%	3.6%
Pyrene	2.18	3.00	72.7%	2.22	3.00	74.0%	1.8%
Benzo(a)anthracene	2.15	3.00	71.7%	2.17	3.00	72.3%	0.9%
Chrysene	2.09	3.00	69.7%	2.13	3.00	71.0%	1.9%
Benzo(b)fluoranthene	2.47	3.00	82.3%	2.64	3.00	88.0%	6.7%
Benzo(k)fluoranthene	2.29	3.00	76.3%	2.41	3.00	80.3%	5.1%
Benzo(a)pyrene	2.13	3.00	71.0%	2.12	3.00	70.7%	0.5%
Indeno(1,2,3-cd)pyrene	2.43	3.00	81.0%	2.39	3.00	79.7%	1.7%
Dibenz(a,h)anthracene	2.50	3.00	83.3%	2.51	3.00	83.7%	0.4%
Benzo(g,h,i)perylene	2.44	3.00	81.3%	2.46	3.00	82.0%	0.8%
Total Benzofluoranthenes	6.52	9.00	72.4%	6.98	9.00	77.6%	6.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-Fluoranthene	74.7%	75.3%
d10-2-Methylnaphthalene	55.0%	56.0%
d14-Dibenzo(a,h)anthracene	70.3%	79.7%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

ZP15MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP15

Project: GAS WORKS PARK-PLAY

Lab File ID: 01131545

Date Extracted: 12/18/14

Instrument ID: NT8

Date Analyzed: 01/14/15

Matrix: LIQUID

Time Analyzed: 0546

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	ZO53LCSW1	ZO53LCSW1	01131546	01/14/15
02	ZO53LCSDW1	ZO53LCSDW1	01141524	01/14/15
03	MW-36D-141215	ZP15A	01151520	01/15/15
04	MW-36S-141215	ZP15B	01151521	01/15/15
05	MW-36D-141215	ZP15E	01151522	01/15/15
06	MW-36S-141215	ZP15F	01151523	01/15/15
07	MW-36D-141215	ZP15A	01151525	01/15/15
08	MW-36S-141215	ZP15B	01151526	01/15/15
09	MW-36D-141215	ZP15E	01151527	01/15/15
10	MW-36S-141215	ZP15F	01151528	01/15/15
11	MW-36D-141215	ZP15A	01161512	01/16/15
12	MW-36S-141215	ZP15B	01161513	01/16/15
13	MW-36D-141215	ZP15E	01161514	01/16/15
14	MW-36S-141215	ZP15F	01161515	01/16/15
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FORM IV SV

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

ZP16MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP16

Project: GAS WORKS PARK-PLAY

Lab File ID: 01131545

Date Extracted: 12/18/14

Instrument ID: NT8

Date Analyzed: 01/14/15

Matrix: LIQUID

Time Analyzed: 0546

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	ZO53LCSW1	ZO53LCSW1	01131546	01/14/15
02	ZO53LCSDW1	ZO53LCSDW1	01141524	01/14/15
03	RINSATE-141211	ZP16V	01151519	01/15/15
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS **Sample ID: MB-121814**
Extraction Method: SW3520C **METHOD BLANK**

Lab Sample ID: MB-121814
LIMS ID: 14-27518
Matrix: Water
Data Release Authorized:
Reported: 01/19/15

QC Report No: ZP15-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted: 12/18/14
Date Analyzed: 01/14/15 05:46
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
91-20-3	Naphthalene	0.030	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.038	0.10	< 0.10 U
83-32-9	Acenaphthene	0.030	0.10	< 0.10 U
86-73-7	Fluorene	0.028	0.10	< 0.10 U
85-01-8	Phenanthrene	0.028	0.10	< 0.10 U
120-12-7	Anthracene	0.035	0.10	< 0.10 U
206-44-0	Fluoranthene	0.035	0.10	< 0.10 U
129-00-0	Pyrene	0.043	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.040	0.10	< 0.10 U
218-01-9	Chrysene	0.032	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.042	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.043	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.043	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.042	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.054	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.039	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.041	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	70.7%
d10-2-Methylnaphthalene	52.3%
d14-Dibenzo(a,h)anthracene	72.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-122414
LAB CONTROL SAMPLE

Lab Sample ID: LCS-122414
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
Event: 0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted: 12/24/14

Date Analyzed LCS: 01/13/15 20:53
LCSD: 01/13/15 21:18
Instrument/Analyst LCS: NT8/JZ
LCSD: NT8/JZ

Sample Amount LCS: 10.00 g-dry-wt
LCSD: 10.00 g-dry-wt
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	74.7 B	150	49.8%	80.6 B	150	53.7%	7.6%
Acenaphthylene	81.8	150	54.5%	80.5	150	53.7%	1.6%
Acenaphthene	75.8	150	50.5%	80.9	150	53.9%	6.5%
Fluorene	85.6	150	57.1%	94.6	150	63.1%	10.0%
Phenanthrene	94.7	150	63.1%	101	150	67.3%	6.4%
Anthracene	91.8	150	61.2%	94.8	150	63.2%	3.2%
Fluoranthene	101	150	67.3%	108	150	72.0%	6.7%
Pyrene	101	150	67.3%	108	150	72.0%	6.7%
Benzo(a)anthracene	102	150	68.0%	108	150	72.0%	5.7%
Chrysene	99.0	150	66.0%	105	150	70.0%	5.9%
Benzo(b)fluoranthene	109	150	72.7%	115	150	76.7%	5.4%
Benzo(k)fluoranthene	103	150	68.7%	107	150	71.3%	3.8%
Benzo(a)pyrene	100	150	66.7%	103	150	68.7%	3.0%
Indeno(1,2,3-cd)pyrene	116	150	77.3%	119	150	79.3%	2.6%
Dibenz(a,h)anthracene	120	150	80.0%	123	150	82.0%	2.5%
Benzo(g,h,i)perylene	116	150	77.3%	122	150	81.3%	5.0%
Total Benzofluoranthenes	292	450	64.9%	306	450	68.0%	4.7%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-Fluoranthene	70.7%	71.7%
d10-2-Methylnaphthalene	55.3%	54.7%
d14-Dibenzo(a,h)anthracene	87.7%	88.3%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

ZP16MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOENGINEERS

ARI Job No: ZP16

Project: GAS WORKS PARK-PLAY

Lab File ID: 01141503

Date Extracted: 12/24/14

Instrument ID: NT8

Date Analyzed: 01/14/15

Matrix: SOLID

Time Analyzed: 1123

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	ZP06LCSS1	ZP06LCSS1	01131524	01/13/15
02	ZP06LCSDS1	ZP06LCSDS1	01131525	01/13/15
03	PAI-9-12.5-13.0	ZP16A	01131530	01/13/15
04	PAI-9-12.5-13-DU	ZP16B	01131531	01/13/15
05	PAI-10-9.5-10.0	ZP16C	01131532	01/14/15
06	PAI-10-19.5-20.0	ZP16D	01131533	01/14/15
07	PAI-10-24.5-25.0	ZP16E	01141506	01/14/15
08	PAI-9-12.5-13.0	ZP16A	01141507	01/14/15
09	PAI-9-12.5-13-DU	ZP16B	01141508	01/14/15
10	PAI-10-9.5-10.0	ZP16C	01141509	01/14/15
11	PAI-10-19.5-20.0	ZP16D	01141510	01/14/15
12	PAI-10-24.5-25.0	ZP16E	01141511	01/14/15
13	PAI-9-12.5-13.0	ZP16A	01141512	01/14/15
14	PAI-10-9.5-10.0	ZP16C	01141513	01/14/15
15	PAI-10-19.5-20.0	ZP16D	01141514	01/14/15
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Extraction Method: SW3546

Sample ID: MB-122414
METHOD BLANK

Lab Sample ID: MB-122414
LIMS ID: 14-27409
Matrix: Soil
Data Release Authorized:
Reported: 01/14/15

QC Report No: ZP16-Geoengineers
Project: Gas Works Park-Play Area Investigat
0186-846-01 Task 1520
Date Sampled: NA
Date Received: NA

Date Extracted: 12/24/14
Date Analyzed: 01/14/15 11:23
Instrument/Analyst: NT8/JZ
GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	DL	LOQ	Result
91-20-3	**Naphthalene**	**2.3**	**5.0**	**3.6 J**
208-96-8	Acenaphthylene	1.6	5.0	< 5.0 U
83-32-9	Acenaphthene	1.5	5.0	< 5.0 U
86-73-7	Fluorene	1.5	5.0	< 5.0 U
85-01-8	Phenanthrene	1.6	5.0	< 5.0 U
120-12-7	Anthracene	1.8	5.0	< 5.0 U
206-44-0	Fluoranthene	1.9	5.0	< 5.0 U
129-00-0	Pyrene	2.3	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	2.2	5.0	< 5.0 U
218-01-9	Chrysene	1.9	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.1	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	2.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.4	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	2.6	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	2.8	5.0	< 5.0 U
TOTBFA	Total Benzofluoranthenes	2.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	74.0%
d10-2-Methylnaphthalene	50.3%
d14-Dibenzo(a,h)anthracen	84.3%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/05/15 DFTPP Injection Time: 1510

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	25.9
68	Less than 2.0% of mass 69	1.0 (1.9)1
69	Mass 69 relative abundance	50.7
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	10.0 - 80.0% of mass 198	51.2
197	Less than 2.0% of mass 198	0.7
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.2
365	Greater than 1.0% of mass 198	4.12
441	0.0 - 24.0% of mass 442	8.7 (14.6)2
442	50.0 - 200.0% of mass 198	59.9
443	15.0 - 24.0% of mass 442	12.1 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC250105	SDA0002-CAL4	01051502	01/05/15	1523
02	IC010105	SDA0002-CAL1	01051503	01/05/15	1548
03	IC050105	SDA0002-CAL2	01051504	01/05/15	1614
04	IC10105	SDA0002-CAL3	01051505	01/05/15	1639
05	IC50105	SDA0002-CAL5	01051506	01/05/15	1704
06	IC100105	SDA0002-CAL6	01051507	01/05/15	1730
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/13/15 DFTPP Injection Time: 1833

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	48.6
70	Less than 2.0% of mass 69	0.3 (0.7)1
127	10.0 - 80.0% of mass 198	48.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.4
365	Greater than 1.0% of mass 198	3.71
441	0.0 - 24.0% of mass 442	9.0 (16.2)2
442	50.0 - 200.0% of mass 198	55.7
443	15.0 - 24.0% of mass 442	12.0 (21.6)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0113	ICV0113	01131519	01/13/15	1846
02	ZO53MBW1	ZO53MBW1	01131545	01/14/15	0546
03	ZO53LCSW1	ZO53LCSW1	01131546	01/14/15	0611
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/14/15 DFTPP Injection Time: 1044

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	17.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	51.9
70	Less than 2.0% of mass 69	0.4 (0.7)1
127	10.0 - 80.0% of mass 198	48.8
197	Less than 2.0% of mass 198	0.3
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.6
275	10.0 - 60.0% of mass 198	31.3
365	Greater than 1.0% of mass 198	3.42
441	0.0 - 24.0% of mass 442	9.3 (15.9)2
442	50.0 - 200.0% of mass 198	58.5
443	15.0 - 24.0% of mass 442	11.7 (20.1)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0114	ICV0114	01141502	01/14/15	1057
02	ZO53LCSDW1	ZO53LCSDW1	01141524	01/14/15	2013
03					
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FORM V SV

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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/15/15 DFTPP Injection Time: 0943

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.1 (0.2)1
69	Mass 69 relative abundance	53.4
70	Less than 2.0% of mass 69	0.4 (0.7)1
127	10.0 - 80.0% of mass 198	49.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	32.6
365	Greater than 1.0% of mass 198	4.13
441	0.0 - 24.0% of mass 442	9.9 (15.8)2
442	50.0 - 200.0% of mass 198	62.6
443	15.0 - 24.0% of mass 442	12.8 (20.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0115	ICV0115	01151502	01/15/15	0956
02	MW-36D-141215	ZP15A	01151520	01/15/15	1732
03	MW-36S-141215	ZP15B	01151521	01/15/15	1757
04	MW-36D-141215	ZP15E	01151522	01/15/15	1822
05	MW-36S-141215	ZP15F	01151523	01/15/15	1847
06	MW-36D-141215	ZP15A	01151525	01/15/15	1938
07	MW-36S-141215	ZP15B	01151526	01/15/15	2003
08	MW-36D-141215	ZP15E	01151527	01/15/15	2029
09	MW-36S-141215	ZP15F	01151528	01/15/15	2054
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FORM V SV

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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY

DFTPP Injection Date: 01/15/15 DFTPP Injection Time: 0943

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.1 (0.2)1
69	Mass 69 relative abundance	53.4
70	Less than 2.0% of mass 69	0.4 (0.7)1
127	10.0 - 80.0% of mass 198	49.3
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	32.6
365	Greater than 1.0% of mass 198	4.13
441	0.0 - 24.0% of mass 442	9.9 (15.8)2
442	50.0 - 200.0% of mass 198	62.6
443	15.0 - 24.0% of mass 442	12.8 (20.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0115	ICV0115	01151502	01/15/15	0956
02	RINSATE-141211	ZP16V	01151519	01/15/15	1706
03					
04					
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FORM V SV

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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/16/15 DFTPP Injection Time: 0843

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	18.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	53.6
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	10.0 - 80.0% of mass 198	49.8
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.6
275	10.0 - 60.0% of mass 198	32.5
365	Greater than 1.0% of mass 198	3.95
441	0.0 - 24.0% of mass 442	9.7 (15.5)2
442	50.0 - 200.0% of mass 198	62.5
443	15.0 - 24.0% of mass 442	12.7 (20.3)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ICV0116	ICV0116	01161502	01/16/15	0856
02	MW-36D-141215	ZP15A	01161512	01/16/15	1307
03	MW-36S-141215	ZP15B	01161513	01/16/15	1332
04	MW-36D-141215	ZP15E	01161514	01/16/15	1357
05	MW-36S-141215	ZP15F	01161515	01/16/15	1422
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FORM V SV

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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GEOENGINEERS

Instrument ID: NT8 Project: GAS WORKS PARK-PLAY AREA

DFTPP Injection Date: 01/05/15 DFTPP Injection Time: 1510

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	25.9
68	Less than 2.0% of mass 69	1.0 (1.9)1
69	Mass 69 relative abundance	50.7
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	10.0 - 80.0% of mass 198	51.2
197	Less than 2.0% of mass 198	0.7
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.7
275	10.0 - 60.0% of mass 198	31.2
365	Greater than 1.0% of mass 198	4.12
441	0.0 - 24.0% of mass 442	8.7 (14.6)2
442	50.0 - 200.0% of mass 198	59.9
443	15.0 - 24.0% of mass 442	12.1 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC250105	SDA0002-CAL4	01051502	01/05/15	1523
02	IC010105	SDA0002-CAL1	01051503	01/05/15	1548
03	IC050105	SDA0002-CAL2	01051504	01/05/15	1614
04	IC10105	SDA0002-CAL3	01051505	01/05/15	1639
05	IC50105	SDA0002-CAL5	01051506	01/05/15	1704
06	IC100105	SDA0002-CAL6	01051507	01/05/15	1730
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FORM V SV