CETIFICATION

SDG No:	JC16204	Laboratory:	Accutest, New Jersey
Site:	BMS, Former Brule Area, PR	Matrix:	Groundwater

Humacao, PR

SUMMARY: Groundwater samples (Table 1) were collected on the BMSMC facility – Former Brule Area. The BMSMC facility is located in Humacao, PR. Samples were taken March 11, 2016 and were analyzed in Accutest Laboratory of Dayton, New Jersey that reported the data under SDG No.: JC16204. Results were validated using the latest guidelines (July, 2015) of the EPA Hazardous Waste Support Section and the QC criteria for SW 846 methods, latest revision, for low molecular weight alcohols (LMWA). The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. Data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	ANALYSIS PERFORMED
JC16204-1	BR-1	VOCs; SVOCs; NAPHTHALENE; 1,4-DIOXANE (SIM); LMWA
JC16204-2	BR-2	VOCs; SVOCs; NAPHTHALENE; 1,4-DIOXANE (SIM); LMWA
JC16204-3	BR-2D	VOCs; SVOCs; NAPHTHALENE; 1,4-DIOXANE (SIM); LMWA
JC16204-4	BR-3	VOCs; SVOCs; NAPHTHALENE; 1,4-DIOXANE (SIM); LMWA
JC16204-5	EB031116	VOCs; SVOCs; NAPHTHALENE; 1,4-DIOXANE (SIM); LMWA
JC16204-6	FB031116	VOCs; SVOCs; NAPHTHALENE; 1,4-DIOXANE (SIM); LMWA
JC16204-7	TB030902	VOCs; LMWA

Reviewer Name: Rafael Infante
Chemist license 1888

Signature: Rafael Infante

Date: April 17, 2016

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Report of Analysis

Client Sample ID:	BR-1		
Lab Sample ID:	JC16204-1	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A149430.D	1	03/18/16	TK	n/a	n/a	V3A6450
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	6.9	10	3.3	ug/l	J
71-43-2	Benzene	ND	0.50	0.24	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.37	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.23	ug/l	
75-25-2	Bromoform	ND	1.0	0.23	ug/l	
74-83-9	Bromomethane	ND	2.0	0.42	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	5.6	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.25	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.22	ug/l	
108-90-7	Chlorobenzene	1.2	1.0	0.19	ug/l	
75-00-3	Chloroethane	ND	1.0	0.34	ug/l	
67-66-3	Chloroform	ND	1.0	0.19	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
110-82-7	Cyclohexane	4.0	5.0	0.28	ug/l	J
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	0.99	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.15	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.23	ug/l	
95-50-1	1,2-Dichlorobenzene	0.93	1.0	0.19	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.23	ug/l	
106-46-7	1,4-Dichlorobenzene	0.64	1.0	0.27	ug/l	J
75-71-8	Dichlorodifluoromethane	ND	2.0	0.90	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.17	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.51	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.27	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.65	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.39	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.19	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
76-13-1	Freon 113	ND	5.0	0.52	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.7	ug/l	

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E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-1		
Lab Sample ID:	JC16204-1	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	2.8	1.0	0.23	ug/l	
79-20-9	Methyl Acetate	ND	5.0	1.9	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.22	ug/l	
1634-04-4	Methyl Tert Butyl Ether	10.9	1.0	0.24	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
100-42-5	Styrene	ND	1.0	0.27	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.40	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.23	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.21	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.21	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.22	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.43	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.15	ug/l	
	m,p-Xylene	ND	1.0	0.38	ug/l	
95-47-6	o-Xylene	ND	1.0	0.17	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		76-120%
17060-07-0	1,2-Dichloroethane-D4	94%		73-122%
2037-26-5	Toluene-D8	99%		84-119%
460-00-4	4-Bromofluorobenzene	93%		78-117%

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-1		
Lab Sample ID:	JC16204-1	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P57281.D	1	03/16/16	SD	03/16/16	OP92132	E2P2497
Run #2	2P57313.D	2	03/17/16	RL	03/16/16	OP92132	E2P2498

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2	1000 ml	1.0 ml

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.93	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	1.4	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	1.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	1.1	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	0.87	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.82	ug/l	
	3&4-Methylphenol	ND	2.0	0.67	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.4	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	5.0	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.31	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.4	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.29	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.24	ug/l	
98-86-2	Acetophenone	ND	2.0	0.28	ug/l	
120-12-7	Anthracene	0.46	1.0	0.25	ug/l	J
1912-24-9	Atrazine	ND	2.0	0.42	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.34	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.32	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.33	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.32	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.41	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.37	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.37	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.27	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.26	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.30	ug/l	
106-47-8	4-Chloroaniline	0.97	5.0	0.23	ug/l	J
86-74-8	Carbazole	ND	1.0	0.29	ug/l	

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B = Indicates analyte found in associated method blank
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Report of Analysis

Client Sample ID:	BR-1		
Lab Sample ID:	JC16204-1	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.43	ug/l	
218-01-9	Chrysene	ND	1.0	0.35	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.26	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.34	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.0	0.28	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.27	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.26	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.32	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.53	ug/l	
123-91-1	1,4-Dioxane	156 a	2.0	1.4	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.37	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.79	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.29	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.24	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.31	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.77	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.23	ug/l	
86-73-7	Fluorene	ND	1.0	0.29	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.42	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.36	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	0.29	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.22	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.38	ug/l	
78-59-1	Isophorone	ND	2.0	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	0.21	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.24	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.34	ug/l	
91-20-3	Naphthalene	ND	1.0	0.28	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.46	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.31	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.29	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.23	ug/l	
129-00-0	Pyrene	ND	1.0	0.34	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	47%	43%	14-88%

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-1		
Lab Sample ID:	JC16204-1	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	31%	30%	10-110%
118-79-6	2,4,6-Tribromophenol	95%	77%	39-149%
4165-60-0	Nitrobenzene-d5	82%	76%	32-128%
321-60-8	2-Fluorobiphenyl	102%	85%	35-119%
1718-51-0	Terphenyl-d14	88%	76%	10-126%

(a) Result is from Run# 2

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-1		
Lab Sample ID:	JC16204-1	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P15665.D	1	03/18/16	JJ	03/16/16	OP92132A	E4P805
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	0.130	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	86%		24-125%
321-60-8	2-Fluorobiphenyl	75%		19-127%
1718-51-0	Terphenyl-d14	82%		10-119%

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	BR-1		
Lab Sample ID:	JC16204-1	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH103798.D	1	03/17/16	XPL	n/a	n/a	GGH5211
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	89%		56-145%
111-27-3	Hexanol	84%		56-145%

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	BR-2		
Lab Sample ID:	JC16204-2	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A149429.D	1	03/18/16	TK	n/a	n/a	V3A6450
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.37	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.23	ug/l	
75-25-2	Bromoform	ND	1.0	0.23	ug/l	
74-83-9	Bromomethane	ND	2.0	0.42	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	5.6	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.25	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.22	ug/l	
108-90-7	Chlorobenzene	0.37	1.0	0.19	ug/l	J
75-00-3	Chloroethane	ND	1.0	0.34	ug/l	
67-66-3	Chloroform	ND	1.0	0.19	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
110-82-7	Cyclohexane	0.43	5.0	0.28	ug/l	J
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	0.99	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.15	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.23	ug/l	
95-50-1	1,2-Dichlorobenzene	0.84	1.0	0.19	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.23	ug/l	
106-46-7	1,4-Dichlorobenzene	0.42	1.0	0.27	ug/l	J
75-71-8	Dichlorodifluoromethane	ND	2.0	0.90	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.17	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.51	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.27	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.65	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.39	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.19	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
76-13-1	Freon 113	ND	5.0	0.52	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.7	ug/l	

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-2		
Lab Sample ID:	JC16204-2	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	0.23	1.0	0.23	ug/l	J
79-20-9	Methyl Acetate	ND	5.0	1.9	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.22	ug/l	
1634-04-4	Methyl Tert Butyl Ether	3.3	1.0	0.24	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
100-42-5	Styrene	ND	1.0	0.27	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.40	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.23	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.21	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.21	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.22	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.43	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.15	ug/l	
	m,p-Xylene	ND	1.0	0.38	ug/l	
95-47-6	o-Xylene	ND	1.0	0.17	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		76-120%
17060-07-0	1,2-Dichloroethane-D4	95%		73-122%
2037-26-5	Toluene-D8	100%		84-119%
460-00-4	4-Bromofluorobenzene	93%		78-117%

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Report of Analysis

Client Sample ID:	BR-2		
Lab Sample ID:	JC16204-2	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P57282.D	1	03/16/16	SD	03/16/16	OP92132	E2P2497
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.93	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	1.4	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	1.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	1.1	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	0.87	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.82	ug/l	
	3&4-Methylphenol	ND	2.0	0.67	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.4	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	5.0	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.31	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.4	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.29	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.24	ug/l	
98-86-2	Acetophenone	ND	2.0	0.28	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
1912-24-9	Atrazine	ND	2.0	0.42	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.34	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.32	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.33	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.32	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.41	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.37	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.37	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.27	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.26	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.30	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.23	ug/l	
86-74-8	Carbazole	ND	1.0	0.29	ug/l	

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-2		
Lab Sample ID:	JC16204-2	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.43	ug/l	
218-01-9	Chrysene	ND	1.0	0.35	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.26	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.34	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.0	0.28	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.27	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.26	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.32	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.53	ug/l	
123-91-1	1,4-Dioxane	15.8	1.0	0.72	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.37	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.79	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.29	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.24	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.31	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.77	ug/l	
206-44-0	Fluoranthene	0.76	1.0	0.23	ug/l	J
86-73-7	Fluorene	ND	1.0	0.29	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.42	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.36	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	0.29	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.22	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.38	ug/l	
78-59-1	Isophorone	ND	2.0	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	0.21	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.24	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.34	ug/l	
91-20-3	Naphthalene	ND	1.0	0.28	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.46	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.31	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.29	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.23	ug/l	
129-00-0	Pyrene	0.42	1.0	0.34	ug/l	J
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	47%		14-88%

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Report of Analysis

Client Sample ID:	BR-2		
Lab Sample ID:	JC16204-2	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	30%		10-110%
118-79-6	2,4,6-Tribromophenol	92%		39-149%
4165-60-0	Nitrobenzene-d5	81%		32-128%
321-60-8	2-Fluorobiphenyl	97%		35-119%
1718-51-0	Terphenyl-d14	87%		10-126%

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Report of Analysis

Client Sample ID:	BR-2		
Lab Sample ID:	JC16204-2	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P15658.D	1	03/17/16	JJ	03/16/16	OP92132A	E4P805
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	89%		24-125%
321-60-8	2-Fluorobiphenyl	79%		19-127%
1718-51-0	Terphenyl-d14	86%		10-119%

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IC # 1885
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B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	BR-2		
Lab Sample ID:	JC16204-2	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH103797.D	1	03/17/16	XPL	n/a	n/a	GGH5211
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	104%		56-145%
111-27-3	Hexanol	95%		56-145%

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SGS Accutest

Report of Analysis

Client Sample ID:	BR-2D		
Lab Sample ID:	JC16204-3	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A149375.D	1	03/17/16	TK	n/a	n/a	V3A6447
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.37	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.23	ug/l	
75-25-2	Bromoform	ND	1.0	0.23	ug/l	
74-83-9	Bromomethane	ND	2.0	0.42	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	5.6	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.25	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.22	ug/l	
108-90-7	Chlorobenzene	0.36	1.0	0.19	ug/l	J
75-00-3	Chloroethane	ND	1.0	0.34	ug/l	
67-66-3	Chloroform	ND	1.0	0.19	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
110-82-7	Cyclohexane	0.46	5.0	0.28	ug/l	J
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	0.99	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.15	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.23	ug/l	
95-50-1	1,2-Dichlorobenzene	0.81	1.0	0.19	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.23	ug/l	
106-46-7	1,4-Dichlorobenzene	0.46	1.0	0.27	ug/l	J
75-71-8	Dichlorodifluoromethane	ND	2.0	0.90	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.17	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.51	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.27	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.65	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.39	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.19	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
76-13-1	Freon 113	ND	5.0	0.52	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.7	ug/l	

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Report of Analysis

Client Sample ID:	BR-2D		
Lab Sample ID:	JC16204-3	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	0.26	1.0	0.23	ug/l	J
79-20-9	Methyl Acetate	ND	5.0	1.9	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.22	ug/l	
1634-04-4	Methyl Tert Butyl Ether	3.5	1.0	0.24	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
100-42-5	Styrene	ND	1.0	0.27	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.40	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.23	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.21	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.21	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.22	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.43	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.15	ug/l	
	m,p-Xylene	ND	1.0	0.38	ug/l	
95-47-6	o-Xylene	ND	1.0	0.17	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		76-120%
17060-07-0	1,2-Dichloroethane-D4	97%		73-122%
2037-26-5	Toluene-D8	99%		84-119%
460-00-4	4-Bromofluorobenzene	96%		78-117%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

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Report of Analysis

Client Sample ID:	BR-2D		
Lab Sample ID:	JC16204-3	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P57283.D	1	03/16/16	SD	03/16/16	OP92132	E2P2497
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.93	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	1.4	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	1.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	1.1	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	0.87	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.82	ug/l	
	3&4-Methylphenol	ND	2.0	0.67	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.4	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	5.0	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.31	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.4	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.29	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.24	ug/l	
98-86-2	Acetophenone	ND	2.0	0.28	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
1912-24-9	Atrazine	ND	2.0	0.42	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.34	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.32	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.33	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.32	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.41	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.37	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.37	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.27	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.26	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.30	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.23	ug/l	
86-74-8	Carbazole	ND	1.0	0.29	ug/l	

COLEGIO DE QUIMICOS DE PUERTO RICO
Rafael Infante Méndez
IQ # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-2D		
Lab Sample ID:	JC16204-3	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.43	ug/l	
218-01-9	Chrysene	ND	1.0	0.35	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.26	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.34	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.0	0.28	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.27	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.26	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.32	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.53	ug/l	
123-91-1	1,4-Dioxane	17.7	1.0	0.72	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.37	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.79	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.29	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.24	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.31	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.77	ug/l	
206-44-0	Fluoranthene	0.84	1.0	0.23	ug/l	J
86-73-7	Fluorene	ND	1.0	0.29	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.42	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.36	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	0.29	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.22	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.38	ug/l	
78-59-1	Isophorone	ND	2.0	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	0.21	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.24	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.34	ug/l	
91-20-3	Naphthalene	ND	1.0	0.28	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.46	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.31	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.29	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.23	ug/l	
129-00-0	Pyrene	0.48	1.0	0.34	ug/l	J
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	49%		14-88%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
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IQ # 1886
QUIMICO LICENCIADO

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-2D		
Lab Sample ID:	JC16204-3	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	33%		10-110%
118-79-6	2,4,6-Tribromophenol	100%		39-149%
4165-60-0	Nitrobenzene-d5	88%		32-128%
321-60-8	2-Fluorobiphenyl	106%		35-119%
1718-51-0	Terphenyl-d14	96%		10-126%

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BR-2D		
Lab Sample ID:	JC16204-3	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P15659.D	1	03/17/16	JJ	03/16/16	OP92132A	E4P805
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	89%		24-125%
321-60-8	2-Fluorobiphenyl	84%		19-127%
1718-51-0	Terphenyl-d14	90%		10-119%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
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IC # 1886
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B = Indicates analyte found in associated method blank
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SGS Accutest

Report of Analysis

Client Sample ID:	BR-2D		
Lab Sample ID:	JC16204-3	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH103796.D	1	03/17/16	XPL	n/a	n/a	GGH5211
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	104%		56-145%
111-27-3	Hexanol	96%		56-145%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
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K # 1888
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SGS Accutest

Report of Analysis

Client Sample ID:	BR-3		
Lab Sample ID:	JC16204-4	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A149376.D	1	03/17/16	TK	n/a	n/a	V3A6447
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.37	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.23	ug/l	
75-25-2	Bromoform	ND	1.0	0.23	ug/l	
74-83-9	Bromomethane	ND	2.0	0.42	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	5.6	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.25	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.22	ug/l	
108-90-7	Chlorobenzene	0.49	1.0	0.19	ug/l	J
75-00-3	Chloroethane	ND	1.0	0.34	ug/l	
67-66-3	Chloroform	ND	1.0	0.19	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	0.99	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.15	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.23	ug/l	
95-50-1	1,2-Dichlorobenzene	0.31	1.0	0.19	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.23	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.27	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.90	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.17	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.51	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.27	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.65	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.39	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.19	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
76-13-1	Freon 113	ND	5.0	0.52	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.7	ug/l	

ESTADO LIBRE ASOCIADO DE PUERTO RICO
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Report of Analysis

Client Sample ID:	BR-3		
Lab Sample ID:	JC16204-4	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	1.6	1.0	0.23	ug/l	
79-20-9	Methyl Acetate	ND	5.0	1.9	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.22	ug/l	
1634-04-4	Methyl Tert Butyl Ether	1.9	1.0	0.24	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
100-42-5	Styrene	ND	1.0	0.27	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.40	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.23	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.21	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.21	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.22	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.43	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.15	ug/l	
	m,p-Xylene	ND	1.0	0.38	ug/l	
95-47-6	o-Xylene	ND	1.0	0.17	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		76-120%
17060-07-0	1,2-Dichloroethane-D4	96%		73-122%
2037-26-5	Toluene-D8	99%		84-119%
460-00-4	4-Bromofluorobenzene	98%		78-117%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
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Report of Analysis

Client Sample ID:	BR-3		
Lab Sample ID:	JC16204-4	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P57284.D	1	03/16/16	SD	03/16/16	OP92132	E2P2497
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.93	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	1.4	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	1.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	1.1	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	0.87	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.82	ug/l	
	3&4-Methylphenol	ND	2.0	0.67	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.4	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	5.0	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.31	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.4	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.29	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.24	ug/l	
98-86-2	Acetophenone	ND	2.0	0.28	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
1912-24-9	Atrazine	ND	2.0	0.42	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.34	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.32	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.33	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.32	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.41	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.37	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.37	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.27	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.26	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.30	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.23	ug/l	
86-74-8	Carbazole	ND	1.0	0.29	ug/l	

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LIBRE ASOCIADO DE PUERTO RICO
Manuel Infante Méndez
QUIMICO LICENCIADO

Report of Analysis

Client Sample ID:	BR-3		
Lab Sample ID:	JC16204-4	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.43	ug/l	
218-01-9	Chrysene	ND	1.0	0.35	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.26	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.34	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.0	0.28	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.27	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.26	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.32	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.53	ug/l	
123-91-1	1,4-Dioxane	55.7	1.0	0.72	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.37	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.79	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.29	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.24	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.31	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.77	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.23	ug/l	
86-73-7	Fluorene	ND	1.0	0.29	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.42	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.36	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	0.29	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.22	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.38	ug/l	
78-59-1	Isophorone	ND	2.0	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	0.21	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.24	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.34	ug/l	
91-20-3	Naphthalene	ND	1.0	0.28	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.46	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.31	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.29	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.23	ug/l	
129-00-0	Pyrene	ND	1.0	0.34	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	53%		14-88%

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LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IQ - 1888
QUIMICO LICENCIADO

Report of Analysis

Client Sample ID:	BR-3		
Lab Sample ID:	JC16204-4	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	36%		10-110%
118-79-6	2,4,6-Tribromophenol	100%		39-149%
4165-60-0	Nitrobenzene-d5	89%		32-128%
321-60-8	2-Fluorobiphenyl	109%		35-119%
1718-51-0	Terphenyl-d14	93%		10-126%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IQ = 1888
QUIMICO LICENCIADO

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	BR-3		
Lab Sample ID:	JC16204-4	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P15660.D	1	03/17/16	JJ	03/16/16	OP92132A	E4P805
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	96%		24-125%
321-60-8	2-Fluorobiphenyl	84%		19-127%
1718-51-0	Terphenyl-d14	90%		10-119%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
JC - 1688
QUIMICO LICENCIADO

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N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	BR-3		
Lab Sample ID:	JC16204-4	**Date Sampled:**	03/11/16
Matrix:	AQ - Ground Water	**Date Received:**	03/15/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH103795.D	1	03/17/16	XPL	n/a	n/a	GGH5211
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	102%		56-145%
111-27-3	Hexanol	94%		56-145%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

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N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	EB031116		
Lab Sample ID:	JC16204-5	**Date Sampled:**	03/11/16
Matrix:	AQ - Equipment Blank	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A149428.D	1	03/18/16	TK	n/a	n/a	V3A6450
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.37	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.23	ug/l	
75-25-2	Bromoform	ND	1.0	0.23	ug/l	
74-83-9	Bromomethane	ND	2.0	0.42	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	5.6	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.25	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.22	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.19	ug/l	
75-00-3	Chloroethane	ND	1.0	0.34	ug/l	
67-66-3	Chloroform	ND	1.0	0.19	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	0.99	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.15	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.23	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.19	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.23	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.27	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.90	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.17	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.51	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.27	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.65	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.39	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.19	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
76-13-1	Freon 113	ND	5.0	0.52	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.7	ug/l	

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Report of Analysis

Client Sample ID:	EB031116		
Lab Sample ID:	JC16204-5	**Date Sampled:**	03/11/16
Matrix:	AQ - Equipment Blank	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
79-20-9	Methyl Acetate	ND	5.0	1.9	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.22	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
100-42-5	Styrene	ND	1.0	0.27	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.40	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.23	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.21	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.21	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.22	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.43	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.15	ug/l	
	m,p-Xylene	ND	1.0	0.38	ug/l	
95-47-6	o-Xylene	ND	1.0	0.17	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		76-120%
17060-07-0	1,2-Dichloroethane-D4	95%		73-122%
2037-26-5	Toluene-D8	98%		84-119%
460-00-4	4-Bromofluorobenzene	95%		78-117%

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SGS Accutest

Report of Analysis

Client Sample ID:	EB031116		
Lab Sample ID:	JC16204-5	**Date Sampled:**	03/11/16
Matrix:	AQ - Equipment Blank	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P57280.D	1	03/16/16	SD	03/16/16	OP92132	E2P2497
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.93	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	1.4	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	1.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	1.1	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	0.87	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.82	ug/l	
	3&4-Methylphenol	ND	2.0	0.67	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.4	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	5.0	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.31	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.4	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.29	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.24	ug/l	
98-86-2	Acetophenone	ND	2.0	0.28	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
1912-24-9	Atrazine	ND	2.0	0.42	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.34	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.32	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.33	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.32	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.41	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.37	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.37	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.27	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.26	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.30	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.23	ug/l	
86-74-8	Carbazole	ND	1.0	0.29	ug/l	

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LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IQ - 1888
QUIMICO LICENCIADO

Report of Analysis

Client Sample ID:	EB031116		
Lab Sample ID:	JC16204-5	**Date Sampled:**	03/11/16
Matrix:	AQ - Equipment Blank	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.43	ug/l	
218-01-9	Chrysene	ND	1.0	0.35	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.26	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.34	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.0	0.28	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.27	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.26	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.32	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.53	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.37	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.79	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.29	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.24	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.31	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.77	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.23	ug/l	
86-73-7	Fluorene	ND	1.0	0.29	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.42	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.36	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	0.29	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.22	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.38	ug/l	
78-59-1	Isophorone	ND	2.0	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	0.21	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.24	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.34	ug/l	
91-20-3	Naphthalene	ND	1.0	0.28	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.46	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.31	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.29	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.23	ug/l	
129-00-0	Pyrene	ND	1.0	0.34	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	50%		14-88%
4165-62-2	Phenol-d5	33%		10-110%

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB031116		
Lab Sample ID:	JC16204-5	**Date Sampled:**	03/11/16
Matrix:	AQ - Equipment Blank	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	91%		39-149%
4165-60-0	Nitrobenzene-d5	81%		32-128%
321-60-8	2-Fluorobiphenyl	98%		35-119%
1718-51-0	Terphenyl-d14	89%		10-126%

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	EB031116		
Lab Sample ID:	JC16204-5	**Date Sampled:**	03/11/16
Matrix:	AQ - Equipment Blank	**Date Received:**	03/15/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P15661.D	1	03/17/16	JJ	03/16/16	OP92132A	E4P805
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
123-91-1	1,4-Dioxane	ND	0.10	0.053	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	88%		24-125%
321-60-8	2-Fluorobiphenyl	78%		19-127%
1718-51-0	Terphenyl-d14	90%		10-119%

LIBRE ASOCIADO DE PUERTO RICO
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SGS Accutest

Report of Analysis

Client Sample ID:	EB031116		
Lab Sample ID:	JC16204-5	**Date Sampled:**	03/11/16
Matrix:	AQ - Equipment Blank	**Date Received:**	03/15/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH103794.D	1	03/17/16	XPL	n/a	n/a	GGH5211
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	258	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	104%		56-145%
111-27-3	Hexanol	98%		56-145%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
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J = Indicates an estimated value
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N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	FB031116		
Lab Sample ID:	JC16204-6	**Date Sampled:**	03/11/16
Matrix:	AQ - Field Blank Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A149371.D	1	03/17/16	TK	n/a	n/a	V3A6447
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.37	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.23	ug/l	
75-25-2	Bromoform	ND	1.0	0.23	ug/l	
74-83-9	Bromomethane	ND	2.0	0.42	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	5.6	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.25	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.22	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.19	ug/l	
75-00-3	Chloroethane	ND	1.0	0.34	ug/l	
67-66-3	Chloroform	ND	1.0	0.19	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	0.99	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.15	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.23	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.19	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.23	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.27	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.90	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.17	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.51	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.27	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.65	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.39	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.19	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
76-13-1	Freon 113	ND	5.0	0.52	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.7	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO

Report of Analysis

Client Sample ID:	FB031116		
Lab Sample ID:	JC16204-6	**Date Sampled:**	03/11/16
Matrix:	AQ - Field Blank Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
79-20-9	Methyl Acetate	ND	5.0	1.9	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.22	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
100-42-5	Styrene	ND	1.0	0.27	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.40	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.23	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.21	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.21	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.22	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.43	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.15	ug/l	
	m,p-Xylene	ND	1.0	0.38	ug/l	
95-47-6	o-Xylene	ND	1.0	0.17	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		76-120%
17060-07-0	1,2-Dichloroethane-D4	95%		73-122%
2037-26-5	Toluene-D8	99%		84-119%
460-00-4	4-Bromofluorobenzene	96%		78-117%

LIBRE ASOCIACIÓN DE PUERTO RICO
Rafael Infante Méndez
IC # 1898
QUÍMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	FB031116		
Lab Sample ID:	JC16204-6	**Date Sampled:**	03/11/16
Matrix:	AQ - Field Blank Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P57279.D	1	03/16/16	SD	03/16/16	OP92132	E2P2497
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.93	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	1.4	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	1.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	1.1	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	0.87	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.82	ug/l	
	3&4-Methylphenol	ND	2.0	0.67	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.4	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	5.0	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.31	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.4	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.29	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.24	ug/l	
98-86-2	Acetophenone	ND	2.0	0.28	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
1912-24-9	Atrazine	ND	2.0	0.42	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.34	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.32	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.33	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.32	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.41	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.37	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.37	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.27	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.26	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.30	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.23	ug/l	
86-74-8	Carbazole	ND	1.0	0.29	ug/l	

ND = Not detected MDL = Method Detection Limit
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E = Indicates value exceeds calibration range

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B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
1886
QUIMICO LICENCIADO

Report of Analysis

Client Sample ID:	FB031116		
Lab Sample ID:	JC16204-6	**Date Sampled:**	03/11/16
Matrix:	AQ - Field Blank Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.43	ug/l	
218-01-9	Chrysene	ND	1.0	0.35	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.26	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.34	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.0	0.28	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.27	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.26	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.32	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.53	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.37	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.79	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.29	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.24	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.31	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.77	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.23	ug/l	
86-73-7	Fluorene	ND	1.0	0.29	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.42	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.36	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	0.29	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.22	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.38	ug/l	
78-59-1	Isophorone	ND	2.0	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	0.21	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.24	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.34	ug/l	
91-20-3	Naphthalene	ND	1.0	0.28	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.46	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.31	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.29	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.23	ug/l	
129-00-0	Pyrene	ND	1.0	0.34	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	47%		14-88%
4165-62-2	Phenol-d5	32%		10-110%

ND = Not detected MDL = Method Detection Limit
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B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB031116		
Lab Sample ID:	JC16204-6	**Date Sampled:**	03/11/16
Matrix:	AQ - Field Blank Water	**Date Received:**	03/15/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

ABN TCL List (SOM0 1.1)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	90%		39-149%
4165-60-0	Nitrobenzene-d5	81%		32-128%
321-60-8	2-Fluorobiphenyl	100%		35-119%
1718-51-0	Terphenyl-d14	91%		10-126%

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N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	FB031116		
Lab Sample ID:	JC16204-6	**Date Sampled:**	03/11/16
Matrix:	AQ - Field Blank Water	**Date Received:**	03/15/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P15662.D	1	03/17/16	JJ	03/16/16	OP92132A	E4P805
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
123-91-1	1,4-Dioxane	ND	0.10	0.053	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	92%		24-125%
321-60-8	2-Fluorobiphenyl	80%		19-127%
1718-51-0	Terphenyl-d14	94%		10-119%

LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IQ = 1808
QUIMICO LICENCIADO

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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	FB031116		
Lab Sample ID:	JC16204-6	**Date Sampled:**	03/11/16
Matrix:	AQ - Field Blank Water	**Date Received:**	03/15/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH103793.D	1	03/17/16	XPL	n/a	n/a	GGH5211
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	102%		56-145%
111-27-3	Hexanol	94%		56-145%

COLEGIO DE QUIMICOS DE PUERTO RICO
Rafael Infante Méndez
JC - 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	TB031116		
Lab Sample ID:	JC16204-7	**Date Sampled:**	03/11/16
Matrix:	AQ - Trip Blank Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A149372.D	1	03/17/16	TK	n/a	n/a	V3A6447
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.37	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.23	ug/l	
75-25-2	Bromoform	ND	1.0	0.23	ug/l	
74-83-9	Bromomethane	ND	2.0	0.42	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	5.6	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.25	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.22	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.19	ug/l	
75-00-3	Chloroethane	ND	1.0	0.34	ug/l	
67-66-3	Chloroform	ND	1.0	0.19	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	0.99	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.15	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.23	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.19	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.23	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.27	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.90	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.17	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.51	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.27	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.65	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.39	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.19	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
76-13-1	Freon 113	ND	5.0	0.52	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.7	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
QUIMICO LICENCIADO

Report of Analysis

Client Sample ID:	TB031116		
Lab Sample ID:	JC16204-7	**Date Sampled:**	03/11/16
Matrix:	AQ - Trip Blank Water	**Date Received:**	03/15/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
79-20-9	Methyl Acetate	ND	5.0	1.9	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.22	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
100-42-5	Styrene	ND	1.0	0.27	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.40	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.23	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.21	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.21	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.22	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.43	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.15	ug/l	
	m,p-Xylene	ND	1.0	0.38	ug/l	
95-47-6	o-Xylene	ND	1.0	0.17	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		76-120%
17060-07-0	1,2-Dichloroethane-D4	97%		73-122%
2037-26-5	Toluene-D8	100%		84-119%
460-00-4	4-Bromofluorobenzene	99%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	TB031116		
Lab Sample ID:	JC16204-7	**Date Sampled:**	03/11/16
Matrix:	AQ - Trip Blank Water	**Date Received:**	03/15/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMS, Former Brule Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH103790.D	1	03/17/16	XPL	n/a	n/a	GGH5211
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	101%		56-145%
111-27-3	Hexanol	93%		56-145%

ND = Not detected MDL = Method Detection Limit
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E = Indicates value exceeds calibration range

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N = Indicates presumptive evidence of a compound

GW
FB
WTB

CHAIN OF CUSTODY

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

Accutest Job #: JC16204
Accutest Quote #:

Client Information

Name: Anderson Mulholland & Associates
Address: 2700 Westchester Avenue
City: Purchase State: NY Zip: 10577
Send Report to: Terry Taylor
Phone #: 914-251-0400

Facility Information

Project Name: Anderson Mulholland
Location:
Project/PO #: BMS: Former Brule Area
FAX #: 914-251-1286

Analytical Information

Field ID / Point of Collection	Collection Date	Time	Sampled By	Matrix	# of bottles	HCL	NaOH	HNO3	H2SO4	None	VOCs, 8260C	SVOC, 8270D	Volatile Alcohols, 8015B	SVOC, 8270D SIM							
BR-1	3/11/16	13:12	NMR	GW	8	X				X	X	X	X	X	1						
BR-2		14:58	NMR	GW	~~8~~ 9	X				X	X	X	X	X	2					E20	
BR-2 D		15:17	NMR	GW	8	X				X	X	X	X	X	3					V745	
BR-3		18:20	NMR	GW	8	X				X	X	X	X	X	4						
EB031116		12:14	NMR	EB	8	X				X	X	X	X	X	5						
~~FB030816~~ FB031116		18:23	NMR	FB	8	X				X	X	X	X	X	6						
TB031116	3/11/16	18:20	NMR	TB	6	X					X		X		7						
0				0																	

INITIAL ASSESSMENT: AM IB
LABEL VERIFICATION: OK

Turnaround Information

- [X] 21 Day Standard
- [ ] 14 Day
- [ ] 7 Days EMERGENCY
- [ ] Other _____ (Days)

RUSH TAT is for FAX data unless previously approved.

Approved By:

Data Deliverable Information

- [ ] NJ Reduced
- [X] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] ASP Category B
- [ ] State Forms

Comments / Remarks

• VOA QC VIAL 3-15-16 [illegible]
Federal Express ID # 8012 1953 4416
Lab Trip Blank Date 3/27/16 Time 1000
SVOC Analysis by Method 8270D SIM for 1,4 Dioxane and Napthalene only.

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 Martin M Kraus	3/14/16 1021	1 FX	2 FX	3-15-16 930	2 [illegible]
3		3	4		4
5		5	Seal # 173, 175	Preserved where applicable: [illegible]	On Ice: [illegible] 3.5, 4.2°C

JP

JC16204: Chain of Custody
Page 1 of 2

EXECUTIVE NARRATIVE

SDG No:	**JC16204**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8260C**	Number of Samples:	**7**
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Four (4) groundwater samples, one field blank, one equipment blank, and one trip blank were analyzed for the VOA TCL list following method SW846-8260C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-33A, Revision 0, June, 2015. SOM02.2. Low/Medium Volatile Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **1. Initial calibration and initial calibration verification within the required criteria. Closing calibration check verification not included in data package. No action taken, professional judgment.**
2. Continuing calibration verifications are within the required criteria for samples in this data package. % differences in the continuing calibration verification that misses the required guidance criteria apply to samples JC16254-7MS/-MSD which are used for QC purposes. No action taken, professional judgment.

Critical findings: **None**
Major findings: **None**
Minor findings: **None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: April 16, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY - JC16024

Sample ID: JC16204-1
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	6.9	ug/L	1.0	J	J	Yes
Benzene	0.5	ug/L	1.0	-	U	Yes
Benzyl Chloride	5.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	2.0	ug/L	1.0	-	U	Yes
Bromomethane	2.0	ug/L	1.0	-	U	Yes
Butanone (MEK)	10	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	1.2	ug/L	1.0	-	-	Yes
Chloroethane	1.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Chloromethane	5.0	ug/L	1.0	-	U	Yes
Cyclohexane	4.0	ug/L	1.0	J	J	Yes
1,2-Dibromo-3-chloropropane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	0.93	ug/L	1.0	J	J	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	0.64	ug/L	1.0	J	J	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes

1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1.0	ug/L	1.0	-	U	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	5.0	ug/L	1.0	-	U	Yes
Isopropylbenzene	2.8	ug/L	1.0	-	-	Yes
Methyl Acetate	5.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	10.9	ug/L	1.0	-	-	Yes
4-Methyl-2-pentanone(MIBK)	2.0	ug/L	1.0	-	U	Yes
Methylene chloride	2.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	10	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	2.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	1.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes
Xylene (total)	1.0	ug/L	1.0	-	U	Yes

Sample ID: JC16204-2
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	10	ug/L	1.0	-	U	Yes
Benzene	0.5	ug/L	1.0	-	U	Yes
Benzyl Chloride	5.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	2.0	ug/L	1.0	-	U	Yes
Bromomethane	2.0	ug/L	1.0	-	U	Yes
Butanone (MEK)	10	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	0.37	ug/L	1.0	J	J	Yes
Chloroethane	1.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Chloromethane	5.0	ug/L	1.0	-	U	Yes
Cyclohexane	0.43	ug/L	1.0	J	J	Yes
1,2-Dibromo-3-chloropropane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	0.84	ug/L	1.0	J	J	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	0.42	ug/L	1.0	J	J	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.4	ug/L	1.0	-	-	Yes

trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1.7	ug/L	1.0	-	-	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	5.0	ug/L	1.0	-	U	Yes
Isopropylbenzene	0.23	ug/L	1.0	J	J	Yes
Methyl Acetate	5.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	3.3	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	2.0	ug/L	1.0	-	U	Yes
Methylene chloride	2.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	10	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	2.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	1.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes
Xylene (total)	1.0	ug/L	1.0	-	U	Yes

Sample ID: JC16204-3
Sample location: BMSMC Building 5 Area
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	10	ug/L	1.0	-	U	Yes
Benzene	1.0	ug/L	1.0	-	U	Yes
Benzyl Chloride	5.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	2.0	ug/L	1.0	-	U	Yes
Bromomethane	2.0	ug/L	1.0	-	U	Yes
Butanone (MEK)	10	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	0.36	ug/L	1.0	J	J	Yes
Chloroethane	1.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Chloromethane	5.0	ug/L	1.0	-	U	Yes
Cyclohexane	0.46	ug/L	1.0	J	J	Yes
1,2-Dibromo-3-chloropropane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	0.81	ug/L	1.0	J	J	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	0.46	ug/L	1.0	J	J	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes

trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1.0	ug/L	1.0	-	U	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	5.0	ug/L	1.0	-	U	Yes
Isopropylbenzene	0.26	ug/L	1.0	J	J	Yes
Methyl Acetate	5.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	3.5	ug/L	1.0	-	-	Yes
4-Methyl-2-pentanone(MIBK)	5.0	ug/L	1.0	-	U	Yes
Methylene chloride	2.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	10	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	1.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes
Xylene (total)	1.0	ug/L	1.0	-	U	Yes

Sample ID: JC16204-4
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	10	ug/L	1.0	-	U	Yes
Benzene	0.50	ug/L	1.0	-	-	Yes
Benzyl Chloride	5.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	2.0	ug/L	1.0	-	U	Yes
Bromomethane	2.0	ug/L	1.0	-	U	Yes
Butanone (MEK)	10	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	0.49	ug/L	1.0	J	J	Yes
Chloroethane	1.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Chloromethane	5.0	ug/L	1.0	-	U	Yes
Cyclohexane	5.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	0.31	ug/L	1.0	J	J	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	0.29	ug/L	1.0	-	U	Yes

trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1040	ug/L	20	-	-	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	5.0	ug/L	1.0	-	U	Yes
Isopropylbenzene	1.6	ug/L	1.0	-	-	Yes
Methyl Acetate	5.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	1.9	ug/L	1.0	-	-	Yes
4-Methyl-2-pentanone(MIBK)	5.0	ug/L	1.0	-	U	Yes
Methylene chloride	2.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	1.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes
Xylene (total)	1.0	ug/L	1.0	-	U	Yes

Sample ID: JC16204-5
Sample location: BMSMC Building 5 Area
Sampling date: 3/11/2016
Matrix: Aqueous EB

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	10	ug/L	1.0	-	U	Yes
Benzene	0.50	ug/L	1.0	-	U	Yes
Benzyl Chloride	5.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	2.0	ug/L	1.0	-	U	Yes
Bromomethane	2.0	ug/L	1.0	-	U	Yes
Butanone (MEK)	10	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	1.0	ug/L	1.0	-	U	Yes
Chloroethane	1.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Chloromethane	5.0	ug/L	1.0	-	U	Yes
Cyclohexane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	2.5	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes

trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1.0	ug/L	1.0	-	U	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	5.0	ug/L	1.0	-	U	Yes
Isopropylbenzene	1.0	ug/L	1.0	-	U	Yes
Methyl Acetate	5.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	1.0	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	5.0	ug/L	1.0	-	U	Yes
Methylene chloride	2.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	10	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	1.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes
Xylene (total)	1.0	ug/L	1.0	-	U	Yes

Sample ID: JC16204-6
Sample location: BMSMC Building 5 Area
Sampling date: 3/11/2016
Matrix: Aqueous FB

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	10	ug/L	1.0	-	U	Yes
Benzene	0.50	ug/L	1.0	-	U	Yes
Benzyl Chloride	5.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	2.0	ug/L	1.0	-	U	Yes
Bromomethane	2.0	ug/L	1.0	-	U	Yes
Butanone (MEK)	10	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	1.0	ug/L	1.0	-	U	Yes
Chloroethane	1.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Chloromethane	5.0	ug/L	1.0	-	U	Yes
Cyclohexane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	2.5	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes

trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1.0	ug/L	1.0	-	U	Yes
Freon 113	5.0	ug/L	1.0	-	U	Yes
2-Hexanone	5.0	ug/L	1.0	-	U	Yes
Isopropylbenzene	1.0	ug/L	1.0	-	U	Yes
Methyl Acetate	5.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	1.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	5.0	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	2.0	ug/L	1.0	-	U	Yes
Methylene chloride	1.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	10	ug/L	1.0	-	U	Yes
Tetrahydrofuran	1.0	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	2.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	1.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes
Xylene (total)	1.0	ug/L	1.0	-	U	Yes

Sample ID: JC16204-7
Sample location: BMSMC Building 5 Area
Sampling date: 3/11/2016
Matrix: Aqueous TB

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	10	ug/L	1.0	-	U	Yes
Benzene	0.50	ug/L	1.0	-	U	Yes
Benzyl Chloride	5.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	2.0	ug/L	1.0	-	U	Yes
Bromomethane	2.0	ug/L	1.0	-	U	Yes
Butanone (MEK)	10	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	1.0	ug/L	1.0	-	U	Yes
Chloroethane	1.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Chloromethane	5.0	ug/L	1.0	-	U	Yes
Cyclohexane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes

trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1.0	ug/L	1.0	-	U	Yes
Freon 113	5.0	ug/L	1.0	-	U	Yes
2-Hexanone	5.0	ug/L	1.0	-	U	Yes
Isopropylbenzene	1.0	ug/L	1.0	-	U	Yes
Methyl Acetate	5.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	1.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	5.0	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	2.0	ug/L	1.0	-	U	Yes
Methylene chloride	1.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	10	ug/L	1.0	-	U	Yes
Tetrahydrofuran	1.0	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	2.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	1.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	1.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes
Xylene (total)	1.0	ug/L	1.0	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number:_JC16204_____
Date:__March_11,_2016_____
Shipping date:__March_14,_2016_____
EPA Region:_____2_____

REVIEW OF VOLATILE ORGANIC PACKAGE
Low/Medium Volatile Data Validation

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA **Hazardous Waste Support Section SOP No. HW-33A Revision 0 SOM02.2. Low/Medium Volatile Data Validation**. July, 2015. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) __Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: ____JC16204_____ Sample matrix: __Groundwater_____
No. of Samples: _____7_____

Trip blank No.: _____JC16204-7_____
Field blank No.: _____JC16204-6_____
Equipment blank No.:_____JC16204-5_____
Field duplicate No.:_____JC16204-2/-3_(BR-2/BR-2D)_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

_Overall Comments:__VOA_TCL_list_(SW846_8260C)_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:___April_16,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
Samples analyzed within method recommended holding time. Sample preservation within required criteria.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4$\pm$ 2°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 14 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 4.6 °C - OK

Actions

Aqueous samples

a. If there is no evidence that the samples were properly preserved (pH < 2, T = 4°C ± 2°C), but the samples were analyzed within the technical holding time [7 days from sample collection], no qualification of the data is necessary.
b. If there is no evidence that the samples were properly preserved, and the samples were analyzed outside of the technical holding time [7 days from sample collection], qualify detects for all volatile compounds as estimated (J) and non-detects as unusable (R).
c. If the samples were properly preserved, and the samples were analyzed within the technical holding time [14 days from sample collection], no qualification of the data is necessary.
d. If the samples were properly preserved, but were analyzed outside of the technical holding time [14 days from sample collection], qualify detects as estimated (J) and non-detects as unusable (R).
e. If air bubbles were present in the sample vial used for analysis, qualify detected compounds as estimated (J-) and non-detected compounds as estimated (UJ).

Non-aqueous samples

a. If there is no evidence that the samples were properly preserved (T < -7°C or T = 4°C ± 2°C and preserved with $NaHSO_4$), but the samples were analyzed within the technical holding time [14 days from sample collection], qualify detects for all volatile compounds as estimated (J) and non-detects as (UJ) or unusable (R) using professional judgment.

b. If the samples were properly preserved, and the samples were analyzed within the technical holding time [14 days from sample collection], no qualification of the data is necessary.

c. If there is no evidence that the samples were properly preserved, and the samples were analyzed outside of the technical holding time [14 days from sample collection], qualify detects for all volatile compounds as estimated (J) and non-detects as unusable (R).

d. If the samples were properly preserved, but were analyzed outside of the technical holding time [14 days from sample collection], qualify detects as estimated (J) and non-detects as unusable (R).

Qualify TCLP/SPLP samples

a. If the TCLP/SPLP ZHE procedure is performed within the extraction technical holding time of 14 days, detects and non-detects should not be qualified.

b. If the TCLP/SPLP ZHE procedure is performed outside the extraction technical holding time of 14 days, qualify detects as estimated (J) and non-detects as unusable (R).

c. If TCLP/SPLP aqueous samples and TCLP/SPLP leachate samples are analyzed within the technical holding time of 7 days, detects and non-detects should not be qualified.

d. If TCLP/SPLP aqueous samples and TCLP/SPLP leachate samples are analyzed outside of the technical holding time of 7 days, qualify detects as estimated (J) and non-detects as unusable (R).

Table 1. Holding Time Actions for Low/Medium Volatile Analyses - Summary

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 days	No qualification	
	No	> 7 days	J	R
	Yes	≤ 14 days	No qualification	
	Yes	> 14 days	J	R
Non-Aqueous	No	≤ 14 days	J	Professional judgment. UJ or R
	Yes	≤ 14 days	No qualification	
	Yes/No	> 14 days	J	R
TCLP/SPLP	Yes	≤ 14 days	No qualification	
TCLP/SPLP	No	> 14 days	J	R
TCLP/SPLP	ZHE performed within the 14-day technical holding time		No qualification	
TCLP/SPLP	ZHE performed outside the 14-day technical holding time		J	R
TCLP/SPLP aqueous & TCLP/SPLP leachate	Analyzed within 7 days		No qualification	
TCLP/SPLP aqueous & TCLP/SPLP leachate	Analyzed outside 7 days		J	R
Sample temperature outside 4°C ± 2°C upon receipt at the laboratory			Use professional judgment	
Holding times grossly exceeded			J	R

All criteria were met __X__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__X___ The BFB performance results were reviewed and found to be within the specified criteria.

__X___ BFB tuning was performed for every 12 hours of sample analysis.

NOTES: All mass spectrometer instrument conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortions for the sole purpose of meeting the method specifications are contrary to the Quality Assurance (QA) objectives, and are therefore unacceptable.

NOTES: No data should be qualified based on BFB failure. Instances of this should be noted in the narrative.

All ion abundance ratios must be normalized to m/z 95, the nominal base peak, even though the ion abundance of m/z 174 may be up to 120% that of m/z 95.

Actions:

If samples are analyzed without a preceding valid instrument performance check, qualify all data in those samples as unusable (R).

If ion abundance criteria are not met, professional judgment may be applied to determine to what extent the data may be utilized. When applying professional judgment to this topic, the most important factors to consider are the empirical results that are relatively insensitive to location on the chromatographic profile and the type of instrumentation. Therefore, the critical ion abundance criteria for BFB are the m/z 95/96, 174/175, 174/176, and 176/177 ratios. The relative abundances of m/z 50 and 75 are of lower importance. This issue is more critical for Tentatively Identified Compounds (TICs) than for target analytes.

Note: State in the Data Review Narrative, decisions to use analytical data associated with BFB instrument performance checks not meeting contract requirements.

Note: Verify that that instrument instrument performance check criteria were achieved using techniques described in Low/Medium Volatiles Organic Analysis, Section II.D.5 of the SOM02.2 NFG, obtain additional information on the instrument performance checks. Make sure that background subtraction was performed from the BFB peak and not from background subtracting from the solvent front or from another region of the chromatogram.

Use professional judgment to determine whether associated data should be qualified based on the spectrum of the mass calibration compound.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below ____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____03/15/16_____
Dates of continuing (initial) calibration:_____03/15/16_____
Dates of continuing calibration:_____03/16/16;_03/18/16;_03/21/15____
Instrument ID numbers:_____GCMS3A_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
03/16/16	cc6446-20	-86.0 %	Acetone	JC16254-7; JC16254-7MS; -7MSD
		-21.7 %	2-butanone	

Note: Initial calibration and initial calibration verification within the required criteria. Closing calibration check verification not included in data package. No action taken, professional judgment.
Continuing calibration verifications are within the required criteria for samples in this data package. % differences in the continuing calibration verification that misses the required guidance criteria apply to samples JC16254-7MS/-MSD which are used for QC purposes. No action taken, professional judgment.

Criteria

The analyte calibration criteria in the following Table must be obtained. Analytes not meeting the criteria are qualified.

A separate worksheet should be filled for each initial curve

Initial Calibration - **Table 2. RRF, %RSD, and %D Acceptance Criteria for Initial Calibration and CCV for Low/Medium Volatile Analysis**

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum %D
Dichlorodifluoromethane	0.010	25.0	±40.0	±50.0
Chloromethane	0.010	20.0	±30.0	±50.0
Vinyl chloride	0.010	20.0	±25.0	±50.0
Bromomethane	0.010	40.0	±30.0	±50.0
Chloroethane	0.010	40.0	±25.0	±50.0
Trichlorofluoromethane	0.010	40.0	±30.0	±50.0
1.1-Dichloroethene	0.060	20.0	±20.0	±25.0
1.1.2-Trichloro-1.2.2-trifluoroethane	0.050	25.0	±25.0	±50.0
Acetone	0.010	40.0	±40.0	±50.0
Carbon disulfide	0.100	20.0	±25.0	±25.0
Methyl acetate	0.010	40.0	±40.0	±50.0
Methylene chloride	0.010	40.0	±30.0	±50.0
trans-1.2-Dichloroethene	0.100	20.0	±20.0	±25.0
Methyl tert-butyl ether	0.100	40.0	±25.0	±50.0
1.1-Dichloroethane	0.300	20.0	±20.0	±25.0
cis-1.2-Dichloroethene	0.200	20.0	±20.0	±25.0
2-Butanone	0.010	40.0	±40.0	±50.0
Bromochloromethane	0.100	20.0	±20.0	±25.0
Chloroform	0.300	20.0	±20.0	±25.0
1.1.1-Trichloroethane	0.050	20.0	±25.0	±25.0
Cyclohexane	0.010	40.0	±25.0	±50.0
Carbon tetrachloride	0.100	20.0	±25.0	±25.0
Benzene	0.200	20.0	±20.0	±25.0
1.2-Dichloroethane	0.070	20.0	±20.0	±25.0
Trichloroethene	0.200	20.0	±20.0	±25.0
Methylcyclohexane	0.050	40.0	±25.0	±50.0
1.2-Dichloropropane	0.200	20.0	±20.0	±25.0
Bromodichloromethane	0.300	20.0	±20.0	±25.0
cis-1.3-Dichloropropene	0.300	20.0	±20.0	±25.0
4-Methyl-2-pentanone	0.030	25.0	±30.0	±50.0
Toluene	0.300	20.0	±20.0	±25.0
trans-1.3-Dichloropropene	0.200	20.0	±20.0	±25.0
1.1.2-Trichloroethane	0.200	20.0	±20.0	±25.0
Tetrachloroethene	0.100	20.0	±20.0	±25.0
2-Hexanone	0.010	40.0	±40.0	±50.0
Dibromochloromethane	0.200	20.0	±20.0	±25.0
1.2-Dibromoethane	0.200	20.0	±20.0	±25.0
Chlorobenzene	0.400	20.0	±20.0	±25.0
Ethylbenzene	0.400	20.0	±20.0	±25.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum
m,p-Xylene	0.200	20.0	±20.0	±25.0
o-Xylene	0.200	20.0	±20.0	±25.0
Styrene	0.200	20.0	±20.0	±25.0
Bromoform	0.100	20.0	±25.0	±50.0
Isopropylbenzene	0.400	20.0	±25.0	±25.0
1,1,2,2-Tetrachloroethane	0.200	20.0	±25.0	±25.0
1,3-Dichlorobenzene	0.500	20.0	±20.0	±25.0
1,4-Dichlorobenzene	0.600	20.0	±20.0	±25.0
1,2-Dichlorobenzene	0.600	20.0	±20.0	±25.0
1,2-Dibromo-3-chloropropane	0.010	25.0	±30.0	±50.0
1,2,4-Trichlorobenzene	0.400	20.0	±30.0	±50.0
1,2,3-Trichlorobenzene	0.400	25.0	±30.0	±50.0
Deuterated Monitoring Compound				
Vinyl chloride-d_3	0.010	20.0	±30.0	±50.0
Chloroethane-d_5	0.010	40.0	±30.0	±50.0
1,1-Dichloroethene-d_2	0.050	20.0	±25.0	±25.0
2-Butanone-d_5	0.010	40.0	±40.0	±50.0
Chloroform-d	0.300	20.0	±20.0	±25.0
1,2-Dichloroethane-d_4	0.060	20.0	±25.0	±25.0
Benzene-d_6	0.300	20.0	±20.0	±25.0
1,2-Dichloropropane-d_6	0.200	20.0	±20.0	±25.0
Toluene-d_8	0.300	20.0	±20.0	±25.0
trans-1,3-Dichloropropene-d_4	0.200	20.0	±20.0	±25.0
2-Hexanone-d_5	0.010	40.0	±40.0	±50.0
1,1,2,2-Tetrachloroethane-d_2	0.200	20.0	±25.0	±25.0
1,2-Dichlorobenzene-d_4	0.400	20.0	±20.0	±25.0

[1] If a closing CCV is acting as an opening CCV, all target analytes and DMCs must meet the requirements for an opening CCV.

Actions:

1. If any volatile target compound has an RRF value less than the minimum in the table, use professional judgment for detects, based on mass spectral identification, to qualify the data as estimated (J+ or R).
   a. If any volatile target compound has an RRF value less than the minimum criterion, qualify non-detected compounds as unusable (R).
   b. If any of the volatile target compounds listed in the Table has %RSD greater than the criteria, qualify detects as estimated (J), and non-detected compounds using professional judgment.
   c. If the volatile target compounds meet the acceptance criteria for RRF and the %RSD, no qualification of the data is necessary.

d. No qualification of the data is necessary on the DMC RRF and %RSD data alone. Use professional judgment and follow the guidelines in Action 2 to evaluate the DMC RRF and %RSD data in conjunction with the DMC recoveries to determine the need for qualification of data.

2. At the reviewer's discretion, and based on the project-specific Data Quality Objectives (DQOs), a more in-depth review may be considered using the following guidelines:
   a. If any volatile target compound has a %RSD greater than the maximum criterion in the Table, and if eliminating either the high or the low-point of the curve does not restore the %RSD to less than or equal to the required maximum:
      i. Qualify detects for that compound(s) as estimated (J).
      ii. Qualify non-detected volatile target compounds using professional judgment.
   b. If the high-point of the curve is outside of the linearity criteria (e.g., due to saturation):
      i. Qualify detects outside of the linear portion of the curve as estimated (J).
      ii. No qualifiers are required for detects in the linear portion of the curve.
      iii. No qualifiers are required for volatile target compounds that were not detected.
   c. If the low-point of the curve is outside of the linearity criteria:
      i. Qualify low-level detects in the area of non-linearity as estimated (J).
      ii. No qualifiers are required for detects in the linear portion of the curve.
      iii. For non-detected volatile compounds, use the lowest point of the linear portion of the curve to determine the new quantitation limit.

Note: If the laboratory has failed to provide adequate calibration information, inform the Region's designated representative to contact the laboratory and request the necessary information. If the information is not available, the reviewer must use professional judgment to assess the data.

State in the Data Review Narrative, if possible, the potential effects on the data due to calibration criteria exceedance.

Note, for the Laboratory COR action, if calibration criteria are grossly exceeded.

Table. Initial Calibration Actions for Low/Medium Volatile Analysis – Summary

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table for target analyte	Use professional judgment J- or R	R
RRF > Minimum RRF in Table for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table for target analyte	J	Use professional judgment
%RSD ≤ Maximum %RSD in Table for target analyte	No qualification	No qualification

All criteria were met __X___
Criteria were not met
and/or see below _____

Continuing Calibration Verification (CCV)

NOTE: Verify that the CCV was run at the required frequency (an opening and closing CCV must be run within 12-hour period) and the CCV was compared to the correct initial calibration. If the mid-point standard from the initial calibration is used as an opening CCV, verify that the result (RRF) of the mid-point standard was compared to the average RRF from the correct initial calibration.

The closing CCV used to bracket the end of a 12-hour analytical sequence may be used as the opening CCV for the new 12-hour analytical sequence, provided that all the technical acceptance criteria are met for an opening CCV (see criteria show before in the Table) . If the closing CCV does not meet the technical acceptance criteria for an opening CCV, then a BFB tune followed by an opening CCV is required and the next 12-hour time period begins with the BFB tune.

All DMCs must meet RRF criteria. No qualification of the data is necessary on the DMCs RRF and %RSD/%D data alone. However, use professional judgment to evaluate the DMC and %RSD/%D data in conjunction with the DMC recoveries to determine the need of qualification the data.

Action:

1. If a CCV (opening and closing) was not run at the appropriate frequency, qualify data using professional judgment.

2. Qualify all volatile target compounds in Table shown before using the following criteria:

   a. For an opening CCV, if any volatile target compound has an RRF value less than the minimum criterion, use professional judgment for detects, based on mass spectral identification, to qualify the data as estimated (J) and qualify non-detected compounds as unusable (R).
   b. For a closing CCV, if any volatile target compound has an RRF value less than the criteria, use professional judgment for detects based on mass spectral identification to qualify the data as estimated (J), and qualify non-detected compounds as unusable (R).
   c. For an opening CCV, if the Percent Difference value for any of the volatile target compounds is outside the limits in calibration criteria Table shown before, qualify detects as estimated (J) and non-detected compounds as estimated (UJ).
   d. For a closing CCV, if the Percent Difference value for any volatile target compound is outside the limits in calibration criteria table, qualify detects as estimated (J) and non-detected compounds as estimated (UJ).
   e. If the volatile target compounds meet the acceptable criteria for RRF and the Percent Difference, no qualification of the data is necessary.

f. No qualification of the data is necessary on the DMC RRF and the Percent Difference data alone. Use professional judgment to evaluate the DMC RRF and Percent Difference data in conjunction with the DMC recoveries to determine the need for qualification of data.

Notes: If the laboratory has failed to provide adequate calibration information, inform the Region's designated representative to contact the laboratory and request the necessary information. If the information is not available, the reviewer must use professional judgment to assess the data.

State in the Data Review Narrative, if possible, the potential effects on the data due to calibration criteria exceedance.

Note, for Contract Laboratory COR action, if calibration criteria are grossly exceeded.

Table. Continuing Calibration Actions for Low/Medium Volatile Analysis – Summary

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table for target analyte	Use professional judgment J or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	RRF ≥ Minimum RRF in Table for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table for target analyte	No qualification	No qualification

All criteria were met __X___
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

The concentration of a target analyte in any blank must not exceed its Contract Required Quantitation Limit (CRQL) (2x CRQLs for Methylene chloride, Acetone, and 2-Butanone). TIC concentration in any blanks must be ≤ 5.0 µg/L for water (0.0050 mg/L for TCLP leachate) and ≤ 5.0 µg/kg for soil matrices.

Laboratory blanks

The method blank, like any other sample in the SDG, must meet the technical acceptance criteria for sample analysis.

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_target_analyte_detected_in_method_blanks.				

Field/Equipment/Trip blank

If field or trip blanks are present, the data reviewer should evaluate this data in a similar fashion as the method blanks.

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_target_analytes_detected_in_the_trip/field/equipment_blanks._____

All criteria were met __X___
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Note: All fields blank results associated with a particular group of samples (may exceed one per case) must be used to qualify data. Trip blanks are used to qualify only those samples with which they were shipped. Blanks may not be qualified because of contamination in another blank. Field blanks and trip blanks must be qualified for system monitoring compounds, instrument performance criteria, and spectral or calibration QC problems.

Samples taken from a drinking water tap do not have associated field blanks.

When applied as described in the Table below, the contaminant concentration in the blank is multiplied by the sample dilution factor.

Table. Blank and TCLP/SPLP LEB Actions for Low/Medium Volatile Analysis

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, TCLP/SPLP LEB, Instrument**	Detects	Not detected	No qualification required
	< CRQL *	< CRQL*	Report CRQL value with a U
		≥ CRQL*	No qualification required
	> CRQL *	< CRQL*	Report CRQL value with a U
		≥ CRQL* and ≤ blank concentration	Report blank value for sample concentration with a U
		≥ CRQL* and > blank concentration	No qualification required
	= CRQL*	≤ CRQL*	Report CRQL value with a U
		> CRQL*	No qualification required
	Gross contamination	Detects	Report blank value for sample concentration with a U

* 2x the CRQL for methylene chloride, 2-butanone and acetone.
** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 µg/L.

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike (DMCs) recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Table. Volatile Deuterated Monitoring Compounds (DMCs) and Recovery Limits

DMC	%R for Water Sample	%R for Soil Sample
Vinyl chloride-d3	60-135	30-150
Chloroethane-d5	70-130	30-150
1.1-Dichloroethene-d2	60-125	45-110
2-Butanone-d5	40-130	20-135
Chloroform-d	70-125	40-150
1.2-Dichloroethane-d4	70-125	70-130
Benzene-d6	70-125	20-135
1.2-Dichloropropane-d6	70-120	70-120
Toluene-d8	80-120	30-130
trans-1.3-Dichloropropene-d4	60-125	30-135
2-Hexanone-d5	45-130	20-135
1.1.2.2-Tetrachloroethane-d2	65-120	45-120
1.2-Dichlorobenzene-d4	80-120	75-120

NOTE: The recovery limits for any of the compounds listed in the above Table may be expanded at any time during the period of performance if the United States Environmental Protection Agency (EPA) determines that the limits are too restrictive.

Action:

Are recoveries for DMCs in volatile samples and blanks must be within the limits specified in the Table above. **Yes**? or No?

NOTE: The recovery limits for any of the compounds listed in the Table above may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

List the DMCs that may fail to meet the recovery limits

Sample ID	Date	DMCs	% Recovery	Action

DMCs recoveries within the required limits. Other non-deuterated surrogates added to the samples within laboratory control limits.

Note: Any sample which has more than 3 DMCs outside the limits must be reanalyzed.

Action:

1. For any recovery greater than the upper acceptance limit:
   a. Qualify detected associated volatile target compounds as estimated high (J+).
   b. Do not qualify non-detected associated volatile target compounds.
2. For any recovery greater than or equal to 10%, and less than the lower acceptance limit:
   a. Qualify detected associated volatile target compounds as estimated low (J-).
   b. Qualify non-detected associated volatile target compounds as estimated (UJ).
3. For any recovery less than 10%:
   a. Qualify detected associated volatile target compounds as estimated low (J-).
   b. Qualify non-detected associated volatile target compounds as unusable (R).
4. For any recovery within acceptance limits, no qualification of the data is necessary.
5. In the special case of a blank analysis having DMCs out of specification, the reviewer must give special consideration to the validity of associated sample data. The basic concern is whether the blank problems represent an isolated problem with the blank alone, or whether there is a fundamental problem with the analytical process. For example, if one or more samples in the batch show acceptable DMC recoveries, the reviewer may choose to consider the blank problem to be an isolated occurrence. However, even if this judgment allows some use of the affected data, note analytical problems for Contract Laboratory COR action.
6. If more than three DMCs are outside of the recovery limits for Low/Medium volatiles analysis and the sample was not reanalyzed, note under Contract Problems/Non-Compliance.

Table. Deuterated Monitoring Compound (DMC) Recovery Actions for Low/Medium Volatiles Analyses – Summary

Criteria	Action	
	Detect Associated Compounds	Non-detected Associated Compounds
%R < 10%	J-	R
10% ≤ %R < Lower Acceptance Limit	J-	UJ
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

TABLE. VOLATILE DEUTERATED MONITORING COMPOUNDS (DMCs) AND THE ASSOCIATED TARGET COMPOUNDS

Vinyl chloride-d_3 (DMC-1)	**Chloroethane-d_5 (DMC-2)**	**1,1-Dichloroethene-d_2 (DMC-3)**
Vinyl chloride	Dichlorodifluoromethane Chloromethane Bromomethane Chloroethane Carbon disulfide	trans-1,2-Dichloroethene cis-1,2-Dichloroethene 1,1-Dichloroethene
2-Butanone-d_5 (DMC-4)	**Chloroform-d (DMC-5)**	**1,2-Dichloroethane-d_4 (DMC-6)**
Acetone 2-Butanone	1,1-Dichloroethane Bromochloromethane Chloroform Dibromochloromethane Bromoform	Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane Methyl acetate Methylene chloride Methyl-tert-butyl ether 1,1,1-Trichloroethane Carbon tetrachloride 1,2-Dibromoethane 1,2-Dichloroethane
Benzene-d_6 (DMC-7)	**1,2-Dichloropropane-d_6 (DMC-8)**	**Toluene-d_8 (DMC-9)**
Benzene	Cyclohexane Methylcyclohexane 1,2-Dichloropropane Bromodichloromethane	Trichloroethene Toluene Tetrachloroethene Ethylbenzene o-Xylene m,p-Xylene Styrene Isopropylbenzene
trans-1,3-Dichloropropene-d_4 (DMC-10)	**2-Hexanone-d_5 (DMC-11)**	**1,1,2,2-Tetrachloroethane-d_2 (DMC-12)**
cis-1,3-Dichloropropene trans-1,3-Dichloropropene 1,1,2-Trichloroethane	4-Methyl-2-pentanone 2-Hexanone	1,1,2,2,-Tetrachloroethane 1,2-Dibromo-3-chloropropane
1,2-Dichlorobenzene-d_4 (DMC-13)		
Chlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene		

All criteria were met __X__
Criteria were not met
and/or see below ____

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

NOTES: Data for MS and MSDs will not be present unless requested by the Region.
Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:_JC16325-1MS_____ Matrix/Level:__Groundwater_____
Sample ID:_JC16254-7MS/1MSD_____ Matrix/Level:__Groundwater_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
MS/MSD%_recovery_and_RPD_within_laboratory_control_limits_____					

MS/MSD criteria apply to the unspiked sample. Unspiked sample belongs to from another data package.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

1. No qualification of the data is necessary on MS and MSD data alone. However, using professional judgment, the validator may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_(blank_spike)_within_laboratory_control_limits_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _JC16204-2/-3_____ Matrix:_Groundwater__

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

> **NOTE:** In the absence of QAPP guidance for validating data from field duplicates, the following action will be taken.

Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the values for each compound. Use professional judgment to note large RPDs (> 50%) in the narrative.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within required criteria, < 50 % for target analytes detected in sample and duplicate.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions are suggested based on professional judgment:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __X__
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Internal standard area counts within the required criteria.

Action:

1. If an internal standard area count for a sample or blank is greater than 200.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 20.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 30.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 30.0 seconds, no qualification of the data is necessary.

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

6. If required internal standard compounds are not added to a sample or blank, qualify detects and non-detects as unusable (R).
7. If the required internal standard compound is not analyzed at the specified concentration in a sample or blank, use professional judgment to qualify detects and non-detects.

Table. Internal Standard Actions for Low/Medium Volatiles Analyses - Summary

Criteria	Action	
	Detected Associated Compounds*	Non-detected Associated Compounds*
Area counts > 200% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	J-	No qualification
Area counts < 20% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	J–	R
Area counts ≥ 50% but ≤ 200% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	No qualification	
RT difference > 30.0 seconds between samples and 12-hour standard (opening CCV or mid-point standard from initial calibration)	R **	R
RT difference ≤ 30.0 seconds between samples and 12-hour standard (opening CCV or mid-point standard from initial calibration)	No qualification	

* For volatile compounds associated to each internal standard, see TABLE - VOLATILE TARGET ANALYTES, DEUTERATED MONITORING COMPOUNDS WITH ASSOCIATED INTERNAL STANDARDS FOR QUANTITATION in SOM02.2, Exhibit D, available at: http://www.epa.gov/superfund/programs/clp/download/som/som22d.pdf

** Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.

All criteria were met __X__
Criteria were not met
and/or see below ____

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes**? or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.
b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).
c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene

isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).

4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).
5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met __X__
Criteria were not met
and/or see below ____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
2. For non-aqueous samples, in the percent moisture is less than 70.0%, no qualification of the data is necessary. If the percent moisture is greater than or equal to 70.0% and less than 90.0%, qualify detects as estimated (J) and non-detects as approximated (UJ). If the percent moisture is greater than or equal to 90.0%, qualify detects as estimated (J) and non-detects as unusable (R) (see Table below).
3. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
4. Results between MDL and CRQL should be qualified as estimated "J".
5. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves are not reported.

Table. Percent Moisture Actions for Low/Medium Volatiles Analysis for Non-Aqueous Samples

Criteria	**Action**	
	Detected Associated Compounds	**Non-detected Associated Compounds**
% Moisture < 70.0	No qualification	
70.0 < % Moisture < 90.0	J	UJ
% Moisture > 90.0	J	R

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID

JC16204-1 Cyclohexane RF = 0.562

[ ] = (23797)(50)/(0.562)(526468) = 4.02 ppb Ok

B. Percent Solids

List samples which have ≥ 70 % solids

All criteria were met __X__
Criteria were not met
and/or see below ____

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

All criteria were met __X__
Criteria were not met
and/or see below ____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

Sample ID	Comments	Actions
_____	_____	_____
_No_degradation_of_system_performance_observed.		_____
_____	_____	_____
_____	_____	_____

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions
_____	_____	_____
_No_additional_issues_observed_that_require_qualification_of_the_data._Results_are_valid_and_		
_can_be_used_for_decission_purposes._____		_____
_____	_____	_____
_____	_____	_____

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

EXECUTIVE NARRATIVE

SDG No:	**JC16204**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8270D**	Number of Samples:	**6**
Location:	BMSMC, Former Tank Farm Area Humacao, PR		

SUMMARY: Four (4) groundwater samples one (1) equipment blank, and one (1) field blank were analyzed for the ABN TCL list following method SW846-8270D; Naphthalene and 1,4-Dioxane were also analyzed by SW846-8270D using the selective ion monitoring (SIM) technique. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **1. Closing calibration verification not included in date package. None of the results were qualified, professional judgment.**
2. Several analytes not meeting the % recovery criteria or the RPD criteria in the matrix spike sample used for this data package. No action, sample used for QC purposes only. Outside control limit due to high level of sample relative to amount spiked or matrix interference.

Critical findings: **None**
Major findings: **None**
Minor findings: **None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: April 17, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC16204-1
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.0	ug/L	1	-	U	Yes
4-Chloro-3-methyl phenol	5.0	ug/L	1	-	U	Yes
2,4-Dichlorophenol	2.0	ug/L	1	-	U	Yes
2,4-Dimethylphenol	5.0	ug/L	1	-	U	Yes
2,4-Dinitrophenol	10	ug/L	1	-	U	Yes
4,6-Dinitro-o-cresol	5.0	ug/L	1	-	U	Yes
2-Methylphenol	2.0	ug/L	1	-	U	Yes
3&4-Methylphenol	2.0	ug/L	1	-	U	Yes
2-Nitrophenol	5.0	ug/L	1	-	U	Yes
4-Nitrophenol	10	ug/L	1	-	U	Yes
Pentachlorophenol	5.0	ug/L	1	-	U	Yes
Phenol	2.0	ug/L	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1	-	U	Yes
2,4,5-Trichlorophenol	5.0	ug/L	1	-	U	Yes
2,4,6-Trichlorophenol	5.0	ug/L	1	-	U	Yes
Acenaphthene	1.0	ug/L	1	-	U	Yes
Acenaphthylene	1.0	ug/L	1	-	U	Yes
Acetophenone	2.0	ug/L	1	-	U	Yes
Anthracene	0.46	ug/L	1	J	UJ	Yes
Atrazine	1.0	ug/L	1	-	U	Yes
Benzaldehyde	5.0	ug/L	1	-	U	Yes
Benzo(a)anthracene	1.0	ug/L	1	-	U	Yes
Benzo(a)pyrene	1.0	ug/L	1	-	U	Yes
Benzo(b)fluoranthene	1.0	ug/L	1	-	U	Yes
Benzo(g,h,i)perylene	1.0	ug/L	1	-	U	Yes
Benzo(k)fluoranthene	1.0	ug/L	1	-	U	Yes
4-Bromophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
Butyl benzyl phthalate	2.0	ug/L	1	-	U	Yes
1,1'-Biphenyl	1.0	ug/L	1	-	U	Yes
2-Chloronaphthalene	2.0	ug/L	1	-	U	Yes
4-Chloroaniline	0.97	ug/L	1	J	UJ	Yes
Carbazole	1.0	ug/L	1	-	U	Yes
Caprolactam	2.0	ug/L	1	-	U	Yes
Chrysene	1.0	ug/L	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.0	ug/L	1	-	U	Yes
bis(2-Chloroethyl)ether	2.0	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
bis(2-Chloroisopropyl)ether	2.0	ug/L	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
2,4-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
2,6-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
3,3'-Dichlorobenzidine	2.0	ug/L	1	-	U	Yes
1,4-Dioxane	156	ug/L	2	-	-	Yes
Dibenzo(a,h)anthracene	1.0	ug/L	1	-	U	Yes
Dibenzofuran	5.0	ug/L	1	-	U	Yes
Di-n-butyl phthalate	2.0	ug/L	1	-	U	Yes
Di-n-octyl phthalate	2.0	ug/L	1	-	U	Yes
Diethyl phthalate	2.0	ug/L	1	-	U	Yes
Dimethyl phthalate	2.0	ug/L	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.0	ug/L	1	-	U	Yes
Fluoranthene	1.0	ug/L	1	-	U	Yes
Fluorene	1.0	ug/L	1	-	U	Yes
Hexachlorobenzene	1.0	ug/L	1	-	U	Yes
Hexachlorobutadiene	1.0	ug/L	1	-	U	Yes
Hexachlorocyclopentadiene	10	ug/L	1	-	U	Yes
Hexachloroethane	2.0	ug/L	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.0	ug/L	1	-	U	Yes
Isophorone	2.0	ug/L	1	-	U	Yes
1-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Nitroaniline	5.0	ug/L	1	-	U	Yes
3-Nitroaniline	5.0	ug/L	1	-	U	Yes
4-Nitroaniline	5.0	ug/L	1	-	U	Yes
Naphthalene	1.0	ug/L	1	-	U	Yes
Nitrobenzene	2.0	ug/L	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.0	ug/L	1	-	U	Yes
Nitrosodiphenylamine	5.0	ug/L	1	-	U	Yes
Phenanthrene	1.0	ug/L	1	-	U	Yes
Pyrene	1.0	ug/L	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.0	ug/L	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	0.10	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable

Sample ID: JC16204-2
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.0	ug/L	1	-	U	Yes
4-Chloro-3-methyl phenol	5.0	ug/L	1	-	U	Yes
2,4-Dichlorophenol	2.0	ug/L	1	-	U	Yes
2,4-Dimethylphenol	5.0	ug/L	1	-	U	Yes
2,4-Dinitrophenol	10	ug/L	1	-	U	Yes
4,6-Dinitro-o-cresol	5.0	ug/L	1	-	U	Yes
2-Methylphenol	2.0	ug/L	1	-	U	Yes
3&4-Methylphenol	2.0	ug/L	1	-	U	Yes
2-Nitrophenol	5.0	ug/L	1	-	U	Yes
4-Nitrophenol	10	ug/L	1	-	U	Yes
Pentachlorophenol	5.0	ug/L	1	-	U	Yes
Phenol	2.0	ug/L	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1	-	U	Yes
2,4,5-Trichlorophenol	5.0	ug/L	1	-	U	Yes
2,4,6-Trichlorophenol	5.0	ug/L	1	-	U	Yes
Acenaphthene	1.0	ug/L	1	-	U	Yes
Acenaphthylene	1.0	ug/L	1	-	U	Yes
Acetophenone	2.0	ug/L	1	-	U	Yes
Anthracene	1.0	ug/L	1	-	U	Yes
Atrazine	1.0	ug/L	1	-	U	Yes
Benzaldehyde	5.0	ug/L	1	-	U	Yes
Benzo(a)anthracene	1.0	ug/L	1	-	U	Yes
Benzo(a)pyrene	1.0	ug/L	1	-	U	Yes
Benzo(b)fluoranthene	1.0	ug/L	1	-	U	Yes
Benzo(g,h,i)perylene	1.0	ug/L	1	-	U	Yes
Benzo(k)fluoranthene	1.0	ug/L	1	-	U	Yes
4-Bromophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
Butyl benzyl phthalate	2.0	ug/L	1	-	U	Yes
1,1'-Biphenyl	1.0	ug/L	1	-	U	Yes
2-Chloronaphthalene	2.0	ug/L	1	-	U	Yes
4-Chloroaniline	1.0	ug/L	1	-	U	Yes
Carbazole	1.0	ug/L	1	-	U	Yes
Caprolactam	2.0	ug/L	1	-	U	Yes
Chrysene	1.0	ug/L	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.0	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
bis(2-Chloroethyl)ether	2.0	ug/L	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.0	ug/L	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
2,4-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
2,6-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
3,3'-Dichlorobenzidine	2.0	ug/L	1	-	U	Yes
1,4-Dioxane	15.8	ug/L	1	-	-	Yes
Dibenzo(a,h)anthracene	1.0	ug/L	1	-	U	Yes
Dibenzofuran	5.0	ug/L	1	-	U	Yes
Di-n-butyl phthalate	2.0	ug/L	1	-	U	Yes
Di-n-octyl phthalate	2.0	ug/L	1	-	U	Yes
Diethyl phthalate	2.0	ug/L	1	-	U	Yes
Dimethyl phthalate	2.0	ug/L	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.0	ug/L	1	-	U	Yes
Fluoranthene	0.76	ug/L	1	J	UJ	Yes
Fluorene	1.0	ug/L	1	-	U	Yes
Hexachlorobenzene	1.0	ug/L	1	-	U	Yes
Hexachlorobutadiene	1.0	ug/L	1	-	U	Yes
Hexachlorocyclopentadiene	10	ug/L	1	-	U	Yes
Hexachloroethane	2.0	ug/L	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.0	ug/L	1	-	U	Yes
Isophorone	2.0	ug/L	1	-	U	Yes
1-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Nitroaniline	5.0	ug/L	1	-	U	Yes
3-Nitroaniline	5.0	ug/L	1	-	U	Yes
4-Nitroaniline	5.0	ug/L	1	-	U	Yes
Naphthalene	1.0	ug/L	1	-	U	Yes
Nitrobenzene	2.0	ug/L	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.0	ug/L	1	-	U	Yes
Nitrosodiphenylamine	5.0	ug/L	1	-	U	Yes
Phenanthrene	1.0	ug/L	1	-	U	Yes
Pyrene	0.52	ug/L	1	J	UJ	Yes
1,2,4,5-Tetrachlorobenzene	2.0	ug/L	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	0.10	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable

Sample ID: JC16204-3
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.0	ug/L	1	-	U	Yes
4-Chloro-3-methyl phenol	5.0	ug/L	1	-	U	Yes
2,4-Dichlorophenol	2.0	ug/L	1	-	U	Yes
2,4-Dimethylphenol	5.0	ug/L	1	-	U	Yes
2,4-Dinitrophenol	10	ug/L	1	-	U	Yes
4,6-Dinitro-o-cresol	5.0	ug/L	1	-	U	Yes
2-Methylphenol	2.0	ug/L	1	-	U	Yes
3&4-Methylphenol	2.0	ug/L	1	-	U	Yes
2-Nitrophenol	5.0	ug/L	1	-	U	Yes
4-Nitrophenol	10	ug/L	1	-	U	Yes
Pentachlorophenol	5.0	ug/L	1	-	U	Yes
Phenol	2.0	ug/L	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1	-	U	Yes
2,4,5-Trichlorophenol	5.0	ug/L	1	-	U	Yes
2,4,6-Trichlorophenol	5.0	ug/L	1	-	U	Yes
Acenaphthene	1.0	ug/L	1	-	U	Yes
Acenaphthylene	1.0	ug/L	1	-	U	Yes
Acetophenone	2.0	ug/L	1	-	U	Yes
Anthracene	1.0	ug/L	1	-	U	Yes
Atrazine	1.0	ug/L	1	-	U	Yes
Benzaldehyde	5.0	ug/L	1	-	U	Yes
Benzo(a)anthracene	1.0	ug/L	1	-	U	Yes
Benzo(a)pyrene	1.0	ug/L	1	-	U	Yes
Benzo(b)fluoranthene	1.0	ug/L	1	-	U	Yes
Benzo(g,h,i)perylene	1.0	ug/L	1	-	U	Yes
Benzo(k)fluoranthene	1.0	ug/L	1	-	U	Yes
4-Bromophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
Butyl benzyl phthalate	2.0	ug/L	1	-	U	Yes
1,1'-Biphenyl	1.0	ug/L	1	-	U	Yes
2-Chloronaphthalene	2.0	ug/L	1	-	U	Yes
4-Chloroaniline	5.0	ug/L	1	-	U	Yes
Carbazole	1.0	ug/L	1	-	U	Yes
Caprolactam	2.0	ug/L	1	-	U	Yes
Chrysene	1.0	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
bis(2-Chloroethoxy)methane	2.0	ug/L	1	-	U	Yes
bis(2-Chloroethyl)ether	2.0	ug/L	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.0	ug/L	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
2,4-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
2,6-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
3,3'-Dichlorobenzidine	2.0	ug/L	1	-	U	Yes
1,4-Dioxane	17.70	ug/L	1	-	-	Yes
Dibenzo(a,h)anthracene	1.0	ug/L	1	-	U	Yes
Dibenzofuran	5.0	ug/L	1	-	U	Yes
Di-n-butyl phthalate	2.0	ug/L	1	-	U	Yes
Di-n-octyl phthalate	2.0	ug/L	1	-	U	Yes
Diethyl phthalate	2.0	ug/L	1	-	U	Yes
Dimethyl phthalate	2.0	ug/L	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.0	ug/L	1	-	U	Yes
Fluoranthene	0.84	ug/L	1	J	UJ	Yes
Fluorene	1.0	ug/L	1	-	U	Yes
Hexachlorobenzene	1.0	ug/L	1	-	U	Yes
Hexachlorobutadiene	1.0	ug/L	1	-	U	Yes
Hexachlorocyclopentadiene	10	ug/L	1	-	U	Yes
Hexachloroethane	2.0	ug/L	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.0	ug/L	1	-	U	Yes
Isophorone	2.0	ug/L	1	-	U	Yes
1-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Nitroaniline	5.0	ug/L	1	-	U	Yes
3-Nitroaniline	5.0	ug/L	1	-	U	Yes
4-Nitroaniline	5.0	ug/L	1	-	U	Yes
Naphthalene	1.0	ug/L	1	-	U	Yes
Nitrobenzene	2.0	ug/L	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.0	ug/L	1	-	U	Yes
Nitrosodiphenylamine	5.0	ug/L	1	-	U	Yes
Phenanthrene	1.0	ug/L	1	-	U	Yes
Pyrene	0.48	ug/L	1	J	UJ	Yes
1,2,4,5-Tetrachlorobenzene	2.0	ug/L	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	0.10	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable

Sample ID: JC16204-4
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.0	ug/L	1	-	U	Yes
4-Chloro-3-methyl phenol	5.0	ug/L	1	-	U	Yes
2,4-Dichlorophenol	2.0	ug/L	1	-	U	Yes
2,4-Dimethylphenol	5.0	ug/L	1	-	U	Yes
2,4-Dinitrophenol	10	ug/L	1	-	U	Yes
4,6-Dinitro-o-cresol	5.0	ug/L	1	-	U	Yes
2-Methylphenol	2.0	ug/L	1	-	U	Yes
3&4-Methylphenol	2.0	ug/L	1	-	U	Yes
2-Nitrophenol	5.0	ug/L	1	-	U	Yes
4-Nitrophenol	10	ug/L	1	-	U	Yes
Pentachlorophenol	5.0	ug/L	1	-	U	Yes
Phenol	2.0	ug/L	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1	-	U	Yes
2,4,5-Trichlorophenol	5.0	ug/L	1	-	U	Yes
2,4,6-Trichlorophenol	5.0	ug/L	1	-	U	Yes
Acenaphthene	1.0	ug/L	1	-	U	Yes
Acenaphthylene	1.0	ug/L	1	-	U	Yes
Acetophenone	2.0	ug/L	1	-	U	Yes
Anthracene	1.0	ug/L	1	-	U	Yes
Atrazine	1.0	ug/L	1	-	U	Yes
Benzaldehyde	5.0	ug/L	1	-	U	Yes
Benzo(a)anthracene	1.0	ug/L	1	-	U	Yes
Benzo(a)pyrene	1.0	ug/L	1	-	U	Yes
Benzo(b)fluoranthene	1.0	ug/L	1	-	U	Yes
Benzo(g,h,i)perylene	1.0	ug/L	1	-	U	Yes
Benzo(k)fluoranthene	1.0	ug/L	1	-	U	Yes
4-Bromophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
Butyl benzyl phthalate	2.0	ug/L	1	-	U	Yes
1,1'-Biphenyl	1.0	ug/L	1	-	U	Yes
2-Chloronaphthalene	2.0	ug/L	1	-	U	Yes
4-Chloroaniline	5.0	ug/L	1	-	U	Yes
Carbazole	1.0	ug/L	1	-	U	Yes
Caprolactam	2.0	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Chrysene	1.0	ug/L	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.0	ug/L	1	-	U	Yes
bis(2-Chloroethyl)ether	2.0	ug/L	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.0	ug/L	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
2,4-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
2,6-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
3,3'-Dichlorobenzidine	2.0	ug/L	1	-	U	Yes
1,4-Dioxane	55.7	ug/L	1	-	-	Yes
Dibenzo(a,h)anthracene	1.0	ug/L	1	-	U	Yes
Dibenzofuran	5.0	ug/L	1	-	U	Yes
Di-n-butyl phthalate	2.0	ug/L	1	-	U	Yes
Di-n-octyl phthalate	2.0	ug/L	1	-	U	Yes
Diethyl phthalate	2.0	ug/L	1	-	U	Yes
Dimethyl phthalate	2.0	ug/L	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.0	ug/L	1	-	U	Yes
Fluoranthene	1.0	ug/L	1	-	U	Yes
Fluorene	1.0	ug/L	1	-	U	Yes
Hexachlorobenzene	1.0	ug/L	1	-	U	Yes
Hexachlorobutadiene	1.0	ug/L	1	-	U	Yes
Hexachlorocyclopentadiene	10	ug/L	1	-	U	Yes
Hexachloroethane	2.0	ug/L	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.0	ug/L	1	-	U	Yes
Isophorone	2.0	ug/L	1	-	U	Yes
1-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Nitroaniline	5.0	ug/L	1	-	U	Yes
3-Nitroaniline	5.0	ug/L	1	-	U	Yes
4-Nitroaniline	5.0	ug/L	1	-	U	Yes
Naphthalene	1.0	ug/L	1	-	U	Yes
Nitrobenzene	2.0	ug/L	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.0	ug/L	1	-	U	Yes
Nitrosodiphenylamine	5.0	ug/L	1	-	U	Yes
Phenanthrene	1.0	ug/L	1	-	U	Yes
Pyrene	1.0	ug/L	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.0	ug/L	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	0.10	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable

Sample ID: JC16204-5
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: AQ EB

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.0	ug/L	1	-	U	Yes
4-Chloro-3-methyl phenol	5.0	ug/L	1	-	U	Yes
2,4-Dichlorophenol	2.0	ug/L	1	-	U	Yes
2,4-Dimethylphenol	5.0	ug/L	1	-	U	Yes
2,4-Dinitrophenol	10	ug/L	1	-	U	Yes
4,6-Dinitro-o-cresol	5.0	ug/L	1	-	U	Yes
2-Methylphenol	2.0	ug/L	1	-	U	Yes
3&4-Methylphenol	2.0	ug/L	1	-	U	Yes
2-Nitrophenol	5.0	ug/L	1	-	U	Yes
4-Nitrophenol	10	ug/L	1	-	U	Yes
Pentachlorophenol	5.0	ug/L	1	-	U	Yes
Phenol	2.0	ug/L	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1	-	U	Yes
2,4,5-Trichlorophenol	5.0	ug/L	1	-	U	Yes
2,4,6-Trichlorophenol	5.0	ug/L	1	-	U	Yes
Acenaphthene	1.0	ug/L	1	-	U	Yes
Acenaphthylene	1.0	ug/L	1	-	U	Yes
Acetophenone	2.0	ug/L	1	-	U	Yes
Anthracene	1.0	ug/L	1	-	U	Yes
Atrazine	1.0	ug/L	1	-	U	Yes
Benzaldehyde	5.0	ug/L	1	-	U	Yes
Benzo(a)anthracene	1.0	ug/L	1	-	U	Yes
Benzo(a)pyrene	1.0	ug/L	1	-	U	Yes
Benzo(b)fluoranthene	1.0	ug/L	1	-	U	Yes
Benzo(g,h,i)perylene	1.0	ug/L	1	-	U	Yes
Benzo(k)fluoranthene	1.0	ug/L	1	-	U	Yes
4-Bromophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
Butyl benzyl phthalate	2.0	ug/L	1	-	U	Yes
1,1'-Biphenyl	1.0	ug/L	1	-	U	Yes
2-Chloronaphthalene	2.0	ug/L	1	-	U	Yes
4-Chloroaniline	5.0	ug/L	1	-	U	Yes
Carbazole	1.0	ug/L	1	-	U	Yes
Caprolactam	2.0	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Chrysene	1.0	ug/L	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.0	ug/L	1	-	U	Yes
bis(2-Chloroethyl)ether	2.0	ug/L	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.0	ug/L	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
2,4-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
2,6-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
3,3'-Dichlorobenzidine	2.0	ug/L	1	-	U	Yes
Dibenzo(a,h)anthracene	1.0	ug/L	1	-	U	Yes
Dibenzofuran	5.0	ug/L	1	-	U	Yes
Di-n-butyl phthalate	2.0	ug/L	1	-	U	Yes
Di-n-octyl phthalate	2.0	ug/L	1	-	U	Yes
Diethyl phthalate	2.0	ug/L	1	-	U	Yes
Dimethyl phthalate	2.0	ug/L	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.0	ug/L	1	-	U	Yes
Fluoranthene	1.0	ug/L	1	-	U	Yes
Fluorene	1.0	ug/L	1	-	U	Yes
Hexachlorobenzene	1.0	ug/L	1	-	U	Yes
Hexachlorobutadiene	1.0	ug/L	1	-	U	Yes
Hexachlorocyclopentadiene	10	ug/L	1	-	U	Yes
Hexachloroethane	2.0	ug/L	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.0	ug/L	1	-	U	Yes
Isophorone	2.0	ug/L	1	-	U	Yes
1-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Methylnaphthalene	1.0	ug/L	1	-	J	Yes
2-Nitroaniline	5.0	ug/L	1	-	U	Yes
3-Nitroaniline	5.0	ug/L	1	-	U	Yes
4-Nitroaniline	5.0	ug/L	1	-	U	Yes
Naphthalene	1.0	ug/L	1	-	J	Yes
Nitrobenzene	2.0	ug/L	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.0	ug/L	1	-	U	Yes
Nitrosodiphenylamine	5.0	ug/L	1	-	U	Yes
Phenanthrene	1.0	ug/L	1	-	U	Yes
Pyrene	1.0	ug/L	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.0	ug/L	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	0.10	ug/L	1	-	U	Yes
1,4-Dioxane	0.10	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable

Sample ID: JC16204-6
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: AQ FB

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.0	ug/L	1	-	U	Yes
4-Chloro-3-methyl phenol	5.0	ug/L	1	-	U	Yes
2,4-Dichlorophenol	2.0	ug/L	1	-	U	Yes
2,4-Dimethylphenol	5.0	ug/L	1	-	U	Yes
2,4-Dinitrophenol	10	ug/L	1	-	U	Yes
4,6-Dinitro-o-cresol	5.0	ug/L	1	-	U	Yes
2-Methylphenol	2.0	ug/L	1	-	U	Yes
3&4-Methylphenol	2.0	ug/L	1	-	U	Yes
2-Nitrophenol	5.0	ug/L	1	-	U	Yes
4-Nitrophenol	10	ug/L	1	-	U	Yes
Pentachlorophenol	5.0	ug/L	1	-	U	Yes
Phenol	2.0	ug/L	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1	-	U	Yes
2,4,5-Trichlorophenol	5.0	ug/L	1	-	U	Yes
2,4,6-Trichlorophenol	5.0	ug/L	1	-	U	Yes
Acenaphthene	1.0	ug/L	1	-	U	Yes
Acenaphthylene	1.0	ug/L	1	-	U	Yes
Acetophenone	2.0	ug/L	1	-	U	Yes
Anthracene	1.0	ug/L	1	-	U	Yes
Atrazine	1.0	ug/L	1	-	U	Yes
Benzaldehyde	5.0	ug/L	1	-	U	Yes
Benzo(a)anthracene	1.0	ug/L	1	-	U	Yes
Benzo(a)pyrene	1.0	ug/L	1	-	U	Yes
Benzo(b)fluoranthene	1.0	ug/L	1	-	U	Yes
Benzo(g,h,i)perylene	1.0	ug/L	1	-	U	Yes
Benzo(k)fluoranthene	1.0	ug/L	1	-	U	Yes
4-Bromophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
Butyl benzyl phthalate	2.0	ug/L	1	-	U	Yes
1,1'-Biphenyl	1.0	ug/L	1	-	U	Yes
2-Chloronaphthalene	2.0	ug/L	1	-	U	Yes
4-Chloroaniline	5.0	ug/L	1	-	U	Yes
Carbazole	1.0	ug/L	1	-	U	Yes
Caprolactam	2.0	ug/L	1	-	U	Yes

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Chrysene	1.0	ug/L	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.0	ug/L	1	-	U	Yes
bis(2-Chloroethyl)ether	2.0	ug/L	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.0	ug/L	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.0	ug/L	1	-	U	Yes
2,4-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
2,6-Dinitrotoluene	1.0	ug/L	1	-	U	Yes
3,3'-Dichlorobenzidine	2.0	ug/L	1	-	U	Yes
Dibenzo(a,h)anthracene	1.0	ug/L	1	-	U	Yes
Dibenzofuran	5.0	ug/L	1	-	U	Yes
Di-n-butyl phthalate	2.0	ug/L	1	-	U	Yes
Di-n-octyl phthalate	2.0	ug/L	1	-	U	Yes
Diethyl phthalate	2.0	ug/L	1	-	U	Yes
Dimethyl phthalate	2.0	ug/L	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.0	ug/L	1	-	U	Yes
Fluoranthene	1.0	ug/L	1	-	U	Yes
Fluorene	1.0	ug/L	1	-	U	Yes
Hexachlorobenzene	1.0	ug/L	1	-	U	Yes
Hexachlorobutadiene	1.0	ug/L	1	-	U	Yes
Hexachlorocyclopentadiene	10	ug/L	1	-	U	Yes
Hexachloroethane	2.0	ug/L	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.0	ug/L	1	-	U	Yes
Isophorone	2.0	ug/L	1	-	U	Yes
1-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Methylnaphthalene	1.0	ug/L	1	-	U	Yes
2-Nitroaniline	5.0	ug/L	1	-	U	Yes
3-Nitroaniline	5.0	ug/L	1	-	U	Yes
4-Nitroaniline	5.0	ug/L	1	-	U	Yes
Naphthalene	1.0	ug/L	1	-	J	Yes
Nitrobenzene	2.0	ug/L	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.0	ug/L	1	-	U	Yes
Nitrosodiphenylamine	5.0	ug/L	1	-	U	Yes
Phenanthrene	1.0	ug/L	1	-	U	Yes
Pyrene	1.0	ug/L	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.0	ug/L	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	0.10	ug/L	1	-	U	Yes
1,4-Dioxane	0.10	ug/L	1	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number:_JC16204_____
Date:_March__11,_2016_____
Shipping Date:__March_14,_2016_____
EPA Region:_____2_____

REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for SVOCs included:

Lab. Project/SDG No.: ____JC16204_____ Sample matrix: __Groundwater_____
No. of Samples: ___6_Full_scan/6_SIM_____

Trip blank No.: _____-_____
Field blank No.: _____ JC16204-6_____
Equipment blank No.:_____JC16204-5_____
Field duplicate No.:___JC16204-2/-3_(BR-2/BR-2D)_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_ABN_TCL_list_by_method_SW846-8270D;_Naphthalene_and_1,4-Dioxane_
_analyzed_by_method_SW846-8270D_(SIM)_____
_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:__ Rafael Delfant _____
Date:___April_16,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	pH	ACTION
All samples extracted and analyzed within method recommended holding time.				

Cooler temperature (Criteria: 4 ± 2 °C): _____4.6°C_____

Actions

Results will be qualified based on the criteria of the following Table:

Table 1. Holding Time Actions for Semivolatile Analyses

Matrix	Preserved	Criteria	Action: Detected Associated Compounds	Action: Non-Detected Associated Compounds
Aqueous	No	≤ 7 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 7 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 7 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 7 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R
Non-Aqueous	No	≤ 14 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 14 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 14 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 14 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R

All criteria were met _X__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

_X__ The DFTPP performance results were reviewed and found to be within the specified criteria.

_X__ DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

Notes: These requirements do not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.

All mass spectrometer conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortion are unacceptable

Notes: No data should be qualified based of DFTPP failure.

The requirement to analyze the instrument performance check solution is optional when analysis of PAHs/pentachlorophenol is to be performed by the SIM technique.

List the samples affected: _____

Actions:

1. If sample are analyzed without a preceding valid instrument performance check or are analyzed 12 hours after the Instrument Performance Check, qualify all data in those samples as unusable (R).
2. If ion abundance criteria are not met, use professional judgment to determine to what extent the data may be utilized.
3. State in the Data Review Narrative, decisions to use analytical data associated with DFTPP instrument performance checks not meeting the contract requirements.
4. Use professional judgment to determine if associated data should be qualified based on the spectrum of the mass calibration compounds.

All criteria were met ___X___
Criteria were not met
and/or see below _____

INITIAL CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:__02/01/2016_(SIM)___
Instrument ID numbers:___GCMS4P_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:__03/11/16_(Scan)____
Instrument ID numbers:___GCMS2P_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial calibration meets the required criteria.				

Actions:
Qualify the initial calibration analytes listed in Table 2 using the following criteria:

Table 3. Initial Calibration Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J+ or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table 2 for target analyte	J	Use professional judgment
%RSD ≤ Maximum %RSD in Table 2 for target analyte	No qualification	No qualification

Initial Calibration

Table 2. RRF, %RSD, and %D Acceptance Criteria in Initial Calibration and CCV for Semivolatil Analysis

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
1,4-Dioxane	0.010	40.0	±40.0	±50.0
Benzaldehyde	0.100	40.0	±40.0	±50.0
Phenol	0.080	20.0	±20.0	±25.0
Bis(2-chloroethyl)ether	0.100	20.0	±20.0	±25.0
2-Chlorophenol	0.200	20.0	±20.0	±25.0
2-Methylphenol	0.010	20.0	±20.0	±25.0
3-Methylphenol	0.010	20.0	±20.0	±25.0
2,2'-Oxybis-(1-chloropropane)	0.010	20.0	±25.0	±50.0
Acetophenone	0.060	20.0	±20.0	±25.0
4-Methylphenol	0.010	20.0	±20.0	±25.0
N-Nitroso-di-n-propylamine	0.080	20.0	±25.0	±25.0
Hexachloroethane	0.100	20.0	±20.0	±25.0
Nitrobenzene	0.090	20.0	±20.0	±25.0
Isophorone	0.100	20.0	±20.0	±25.0
2-Nitrophenol	0.060	20.0	±20.0	±25.0
2,4-Dimethylphenol	0.050	20.0	±25.0	±50.0
Bis(2-chloroethoxy)methane	0.080	20.0	±20.0	±25.0
2,4-Dichlorophenol	0.060	20.0	±20.0	±25.0
Naphthalene	0.200	20.0	±20.0	±25.0
4-Chloroaniline	0.010	40.0	±40.0	±50.0
Hexachlorobutadiene	0.040	20.0	±20.0	±25.0
Caprolactam	0.010	40.0	±30.0	±50.0
4-Chloro-3-methylphenol	0.040	20.0	±20.0	±25.0
2-Methylnaphthalene	0.100	20.0	±20.0	±25.0
Hexachlorocyclopentadiene	0.010	40.0	±40.0	±50.0
2,4,6-Trichlorophenol	0.090	20.0	±20.0	±25.0
2,4,5-Trichlorophenol	0.100	20.0	±20.0	±25.0
1,1'-Biphenyl	0.200	20.0	±20.0	±25.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
2-Chloronaphthalene	0.300	20.0	± 20.0	± 25.0
2-Nitroaniline	0.060	20.0	± 25.0	± 25.0
Dimethylphthalate	0.300	20.0	± 25.0	± 25.0
2,6-Dinitrotoluene	0.080	20.0	± 20.0	± 25.0
Acenaphthylene	0.400	20.0	± 20.0	± 25.0
3-Nitroaniline	0.010	20.0	± 25.0	± 50.0
Acenaphthene	0.200	20.0	± 20.0	± 25.0
2,4-Dinitrophenol	0.010	40.0	± 50.0	± 50.0
4-Nitrophenol	0.010	40.0	± 40.0	± 50.0
Dibenzofuran	0.300	20.0	± 20.0	± 25.0
2,4-Dinitrotoluene	0.070	20.0	± 20.0	± 25.0
Diethylphthalate	0.300	20.0	± 20.0	± 25.0
1,2,4,5-Tetrachlorobenzene	0.100	20.0	± 20.0	± 25.0
4-Chlorophenyl-phenylether	0.100	20.0	± 20.0	± 25.0
Fluorene	0.200	20.0	± 20.0	± 25.0
4-Nitroaniline	0.010	40.0	± 40.0	± 50.0
4,6-Dinitro-2-methylphenol	0.010	40.0	± 30.0	± 50.0
4-Bromophenyl-phenyl ether	0.070	20.0	± 20.0	± 25.0
N-Nitrosodiphenylamine	0.100	20.0	± 20.0	± 25.0
Hexachlorobenzene	0.050	20.0	± 20.0	± 25.0
Atrazine	0.010	40.0	± 25.0	± 50.0
Pentachlorophenol	0.010	40.0	± 40.0	± 50.0
Phenanthrene	0.200	20.0	± 20.0	± 25.0
Anthracene	0.200	20.0	± 20.0	± 25.0
Carbazole	0.050	20.0	± 20.0	± 25.0
Di-n-butylphthalate	0.500	20.0	± 20.0	± 25.0
Fluoranthene	0.100	20.0	± 20.0	± 25.0
Pyrene	0.400	20.0	± 25.0	± 50.0
Butylbenzylphthalate	0.100	20.0	± 25.0	± 50.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
3,3'-Dichlorobenzidine	0.010	40.0	± 40.0	± 50.0
Benzo(a)anthracene	0.300	20.0	± 20.0	± 25.0
Chrysene	0.200	20.0	± 20.0	± 50.0
Bis(2-ethylhexyl) phthalate	0.200	20.0	± 25.0	± 50.0
Di-n-octylphthalate	0.010	40.0	± 40.0	± 50.0
Benzo(b)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(k)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(a)pyrene	0.010	20.0	± 20.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.010	20.0	± 25.0	± 50.0
Dibenzo(a,h)anthracene	0.010	20.0	± 25.0	± 50.0
Benzo(g,h,i)perylene	0.010	20.0	± 30.0	± 50.0
2,3,4,6-Tetrachlorophenol	0.040	20.0	± 20.0	± 50.0
Naphthalene	0.600	20.0	± 25.0	± 25.0
2-Methylnaphthalene	0.300	20.0	± 20.0	± 25.0
Acenaphthylene	0.900	20.0	± 20.0	± 25.0
Acenaphthene	0.500	20.0	± 20.0	± 25.0
Fluorene	0.700	20.0	± 25.0	± 50.0
Phenanthrene	0.300	20.0	± 25.0	± 50.0
Anthracene	0.400	20.0	± 25.0	± 50.0
Fluoranthene	0.400	20.0	± 25.0	± 50.0
Pyrene	0.500	20.0	± 30.0	± 50.0
Benzo(a)anthracene	0.400	20.0	± 25.0	± 50.0
Chyrsene	0.400	20.0	± 25.0	± 50.0
Benzo(b)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(k)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(a)pyrene	0.100	20.0	± 25.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.100	20.0	± 40.0	± 50.0
Dibenzo(a,h)anthracene	0.010	25.0	± 40.0	± 50.0
Benzo(g,h,i)perylene	0.020	25.0	± 40.0	± 50.0

Pentachlorophenol	0.010	40.0	± 50.0	± 50.0
Deuterated Monitoring Compounds				

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum %D
1,4-Dioxane-d_8	0.010	20.0	± 25.0	± 50.0
Phenol-d_5	0.010	20.0	± 25.0	± 25.0
Bis-(2-chloroethyl)ether-d_8	0.100	20.0	± 20.0	± 25.0
2-Chlorophenol-d_4	0.200	20.0	± 20.0	± 25.0
4-Methylphenol-d_8	0.010	20.0	± 20.0	± 25.0
4-Chloroaniline-d_4	0.010	40.0	± 40.0	± 50.0
Nitrobenzene-d_5	0.050	20.0	± 20.0	± 25.0
2-Nitrophenol-d_4	0.050	20.0	± 20.0	± 25.0
2,4-Dichlorophenol-d_3	0.060	20.0	± 20.0	± 25.0
Dimethylphthalate-d_6	0.300	20.0	± 20.0	± 25.0
Acenaphthylene-d_8	0.400	20.0	± 20.0	± 25.0
4-Nitrophenol-d_4	0.010	40.0	± 40.0	± 50.0
Fluorene-d_{10}	0.100	20.0	± 20.0	± 25.0
4,6-Dinitro-2-methylphenol-d_2	0.010	40.0	± 30.0	± 50.0
Anthracene-d_{10}	0.300	20.0	± 20.0	± 25.0
Pyrene-d_{10}	0.300	20.0	± 25.0	± 50.0
Benzo(a)pyrene-d_{12}	0.010	20.0	± 20.0	± 50.0
Fluoranthene-d_{10} (SIM)	0.400	20.0	± 25.0	± 50.0
2-Methylnaphthalene-d_{10} (SIM)	0.300	20.0	± 20.0	± 25.0

[1] If a closing CCV is acting as an opening CCV, all target analytes must meet the requirements for an opening CCV.

Note: If analysis by SIM technique is requested for PAH/pentachlorophenols, calibration standards analyzed at 0.10, 0.20, 0.40, 0.80, and 1.0 ng/uL for each target compound of interest and the associated DMCs. Pentachlorophenol will require only a four point initial calibration at 0.20, 0.40, 0.80, and 1.0 ng/uL.

All criteria were met ___X___
Criteria were not met
and/or see below _____

CONTINUING CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:____02/01/16_(SIM)_____ ___03/11/16_(Scan)_____
Date of initial calibration verification (CCV):_02/01/16_____ ___03/11/16_____
Date of continuing calibration verification (CCV):_03/16/16_____ ___03/16/16;_03/17/16_____
Date of closing CCV:_____-_____ _____-_____
Instrument ID numbers:_____GCMS4P_____ _____GCMS2P_____
Matrix/Level:_____Aqueous/low_____ _____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration verification meet the required criteria.				

Note: No final calibration verification performed. Na action taken, professional judgment.

Actions:

Notes: Verify that the CCV is run at the required frequency (an opening and closing CCV must be run within 12-hour period).

All DMCs must meet the RRF values given in Table 2. No qualification of the data is necessary on DMCs RRF and %RSD/%D alone. Use professional judgment to evaluate DMCs and %RSD/%D data in conjunction with DMCs recoveries to determine the need for qualification of the data.

Qualify the initial calibration analytes listed in Table 2 using the following criteria in the CCVs:

Table 4. CCV Actions for Semivolatile Analysis

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency and sequence	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table 2 for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table 2 for target analyte	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Notes: The concentration of non-target compounds in all blanks must be less than or equal to 10 ug/L.

The concentration of target compounds in all blanks must be less than its CRQL listed in the method.

Samples taken from a drinking water tap do not have and associated field blank.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_target_analytes_detected_in_method_blanks.				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_trip_blank_analyzed_with_this_data_package._No_target_analyte_detected_in_the_field/___ _equipment_blanks.				

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Qualify samples based on the criteria summarized in Table 5:

Table 5. Blank and TCLP/SPLP LEB Actions for Semivolatile Analysis

Blank Type	Blank Result	Sample Result	Action
Method, TCLP/SPLP LEB, Field	Detect	Non-detect	No qualification
	< CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL	Use professional judgment
	≥ CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL but < Blank Result	Report at sample results and qualify as non-detect (U) or as unusable (R)
		≥ CRQL and ≥ Blank Result	Use professional judgment
	Grossly high	Detect	Report at sample results and qualify as unusable (R)
	TIC > 5.0 ug/L (water) or 0.0050 mg/L (TCLP leachate) or TIC > 170 ug/Kg (soil)	Detect	Use professional judgment

List samples qualified

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES – DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries – deuterated monitoring compounds. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Notes: Recoveries for DMCs in samples and blanks must be within the limits specified in Table 6.

The recovery limits for any of the compounds listed in Table 6 may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

If a DMC is not added in the samples and blanks or the concentrations of DMCs in the samples and blank not the specified, use professional judgment in qualifying the data.

Table 7. DMC Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
%R < 10% (excluding DMCs with 10% as a lower acceptance limit)	J-	R
10% ≤ %R (excluding DMCs with 10% as a lower acceptance limit) < Lower Acceptance Limit	J-	UJ
Lower Acceptance limit ≤ %R ≤ Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

List the percent recoveries (%Rs) which do not meet the criteria for DMCs (surrogate) recovery.

Matrix:_____

SAMPLE ID **SURROGATE COMPOUND** **ACTION**

_____

_DMCs_meet_the_required_criteria._Non-deuterated_surrogates_added_to_the_samples_____
_within_laboratory_recovery_limits._____

_____

_____

_____

Note: % recovery for Phenol-d5 outside the laboratory control limits but within the guidance document required criteria.

Table 8. Semivolatile DMCs and the Associated Target Analytes

1,4-Dioxane-d_8 (DMC-1)	**Phenol-d_5 (DMC-2)**	**Bis(2-Chloroethyl) ether-d_8 (DMC-3)**
1,4-Dioxane	Benzaldehyde Phenol	Bis(2-chloroethyl)ether 2,2'-Oxybis(1-chloropropane) Bis(2-chloroethoxy)methane
2-Chlorophenol-d_4 (DMC-4)	**4-Methylphenol-d_8 (DMC-5)**	**4-Chloroaniline-d_4 (DMC-6)**
2-Chlorophenol	2-Methylphenol 3-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	4-Chloroaniline Hexachlorocyclopentadiene Dichlorobenzidine
Nitrobenzene-d_5 (DMC-7)	**2-Nitrophenol-d_4 (DMC-8)**	**2,4-Dichlorophenol-d_3 (DMC-9)**
Acetophenone N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,6-Dinitrotoluene 2,4-Dinitrotoluene N-Nitrosodiphenylamine	Isophorone 2-Nitrophenol	2,4-Dichlorophenol Hexachlorobutadiene Hexachlorocyclopentadiene 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 1,2,4,5-Tetrachlorobenzene *Pentachlorophenol 2,3,4,6-Tetrachlorophenol
Dimethylphthalate-d_6 (DMC-10)	**Acenaphthylene-d_8 (DMC-11)**	**4-Nitrophenol-d_4 (DMC-12)**
Caprolactam 1,1'-Biphenyl Dimethylphthalate Diethylphthalate Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl) phthalate Di-n-octylphthalate	*Naphthalene *2-Methylnaphthalene 2-Chloronaphthalene *Acenaphthylene *Acenaphthene	2-Nitroaniline 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline

Fluorene-d_{10} (DMC-13)	**4,6-Dinitro-2-methylphenol-d_2 (DMC-14)**	**Anthracene-d_{10} (DMC-15)**
Dibenzofuran *Fluorene 4-Chlorophenyl-phenylether 4-Bromophenyl-phenylether Carbazole	4,6-Dinitro-2-methylphenol	Hexachlorobenzene Atrazine *Phenanthrene *Anthracene
Pyrene-d_{10} (DMC-16)	**Benzo(a)pyrene-d_{12} (DMC-17)**	
*Fluoranthene *Pyrene *Benzo(a)anthracene *Chrysene	3,3'-Dichlorobenzidine *Benzo(b)fluoranthene *Benzo(k)fluoranthene *Benzo(a)pyrene *Indeno(1,2,3-cd)pyrene *Dibenzo(a,h)anthracene *Benzo(g,h,i)perylene	

*Included in optional Target Analyte List (TAL) of PAHs and PCP only.

Table 9. Semivolatile SIM DMCs and the Associated Target Analytes

Fluoranthene-d10 (DMC-1)	**2-Methylnaphthalene-d10 (DMC-2)**
Fluoranthene	Naphthalene
Pyrene	2-Methylnaphthalene
Benzo(a)anthracene	Acenaphthylene
Chrysene	Acenaphthene
Benzo(b)fluoranthene	Fluorene
Benzo(k)fluoranthene	Pentachlorophenol
Benzo(a)pyrene	Phenanthrene
Indeno(1,2,3-cd)pyrene	Anthracene
Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene	

All criteria were met __X_____
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

NOTES: Data for MS and MSDs will not be present unless requested by the Region.
Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC161708-1_____ Matrix/Level:_Groundwater____
Sample ID:__JC16204-2_(SIM)_____ Matrix/Level:_Groundwater____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
JC16170-8					
_MSD_____	2,4-dinitrophenol_____	-15%___	144___	20_-_160/25_____	No_action_____
_MS/MSD_____	Pentachlorophenol_____		31_____	25_____	No_action_____
_MS/MSD_____	Acenaphthene_____	0%/12%_____		52_-_120_____	No_action_____
_MS/MSD_____	Dibenzofuran_____	13%/32%_____		52_-_112_____	No_action_____
_MS/MSD_____	Fluorene_____	27%/45%_____		56_-_117_____	No_action_____
_MS/MSD_____	2-methylnaphtahlene__	7%/9%_____		34_-_123_____	No_action_____
_MS/MSD_____	Naphthalene_____	0%/0%_____		30_-_121_____	No_action_____
_MS/MSD_____	Phenanthrene_____	0%/0%_____		48_-_121_____	No_action_____

Note: No action, sample used for QC purposes only. Outside control limit due to high level of sample relative to amount spiked or matrix interference.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Internal standard area counts meet the required criteria.

Action:

1. If an internal standard area count for a sample or blank is greater than 200.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table 10 below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 50.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 10.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 10.0 seconds, no qualification of the data is necessary.

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

State in the Data Review Narrative if the required internal standard compounds are not added to a sample or blank or if the required internal standard compound is not analyzed at the specified concentration.

Actions:

Table 10. Internal Standard Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Area response < 20% of the opening CCV or mid-point standard CS3 from ICAL	J+	R
20% ≤ Area response < 50% of the opening CCV or mid-point standard CS3 from ICAL	J+	UJ
50% ≤ Area response ≤ 200% of the opening CCV or mid-point standard CS3 from ICAL	No qualification	No qualification
Area response > 200% of the opening CCV or mid-point standard CS3 from ICAL	J-	No qualification
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL > 10.0 seconds	R	R
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL < 10.0 seconds	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes?** or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_____	_____	_____
_____	_____	_____
_____	_____	_____

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.
b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).
c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_____	_____	_____
_Identified_compounds_meet_the_required_criteria____		_____
_____	_____	_____

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).
4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).

5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met __X__
Criteria were not met
and/or see below _____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. When a sample is analyzed at more than one dilution, the lower CRQL are used unless a QC exceedance dictates the use of higher CRQLs from the diluted sample. Samples reported with an "E" qualifier should be reported from the diluted sample.
2. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
3. For non-aqueous samples, if the solids is less than 10.0%, use professional judgment for both detects and non-detects. If the percent solid for a soil sample is greater than or equal to 10.0% and less than 30.0%, use professional judgment to qualify detects and non-detects. If the percent solid for a soil sample is greater than or equal to 30.0%, detects and non-detects should not be qualified (see Table 11).
4. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
5. Results between MDL and CRQL should be qualified as estimated "J".
6. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves should not be reported.

Table 11. Percent Solids Actions for Semivolatile Analysis for Non-Aqueous Samples

Criteria	Action	
	Detects	Non-detects
%Solids < 10.0%	Use professional judgment	Use professional judgment
10.0% ≤ %Solids ≤ 30.0%	Use professional judgment	Use professional judgment
%Solids > 30.0%	No qualification	No qualification

SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID:__JC16204-1_____ Analyte:__1,4-Dioxane_____ RF:_0.568_

[] = (343760)(40)/(134920)(0.568)
= 179.42 ppm Ok

DATA REVIEW WORKSHEETS

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
JC16204-1	2 x	1,4-Dioxane outside calibration range

All criteria were met __ ___
Criteria were not met
and/or see below ___X___

FIELD DUPLICATE PRECISION

Sample IDs: _____JC16204-5/-6_____ Matrix:_____Groundwater_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: if large RPD (> 50 %) is observed, confirm identification of the samples and note differences. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Acenaphthene	0.29	ND	0.44	-	No action
Fluorene	0.31	ND	0.49	-	No action
2-Methyl naphthalene	0.30	ND	3.4	-	Qualify the results as estimated (J) in JC16204-5/-6.
Naphthalene	0.30	ND	2.3	-	
Phenanthrene	0.24	ND	0.61	-	No action

Note: No action taken, professional judgment. Sample and duplicate < 5 SQL.

All criteria were met __X__
Criteria were not met
and/or see below _____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

Sample ID	Comments	Actions

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions

_No_other_issues_that_required_the_need_to_qualify_the_data._Results_are_valid_and_can_be _used_for_decission_purposes._____

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).
3. Sometimes, due to dilutions, re-analysis or SIM/Scan runs are being performed, there will be multiple results for a single analyte from a single sample. The following criteria and professional judgment are used to determine which result should be reported:
    - The analysis with the lower CRQL
    - The analysis with the better QC results
    - The analysis with the higher results

EXECUTIVE NARRATIVE

SDG No:	**JC16204**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8015C (DAI)**	Number of Samples:	**7**
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Four (4) groundwater samples, one field blank, one equipment blank, and one trip blank were analyzed for the low molecular weight alcohols (LMWAs) list following method SW846-8015C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **1. Initial calibration did not meet the method specific criteria for n-butyl alcohol (initial calibration) in column #2. Results reported are from column #1. Isobutanol continuing calibration verification is outside method specific criteria in one of the columns. No action taken, professional judgment.**
2. Isopropanol detected in the equipment blank. No action taken, professional judgment.

Critical findings: **None**
Major findings: **None**
Minor findings: **None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: April 16, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC16204-1
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC16204-2
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC16204-3
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC16204-4
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC16204-5
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	258	ug/l	1.0	-	-	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC16204-6
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC16204-7
Sample location: BMS, Former Brule Area, PR
Sampling date: 3/11/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number:___JC16204_____
Date:_____03/11/2016_____
Shipping Date:_____03/14/2016_____
EPA Region:_____2_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.
The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The modified data review for VOCs included:

Lab. Project/SDG No.: __JC16204_____ Sample matrix: ___Groundwater_____
No. of Samples: _____7_____

Trip blank No.: _____JC16204-7_____
Field blank No.: _____JC16204-6_____
Equipment blank No.:___JC16204-5_____
Field duplicate No.:____JC16204-2/-3_(BR-2/BR-2D)_____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Low_molecular_weight_alcohols_by_SW-846_8015C_(DAI)_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_Rafael Infante_____
Date:__April_16,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 4.6°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met ____
Criteria were not met
and/or see below __X__

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____02/29/16_____
Dates of continuing calibration:_02/29/16 (initial);_03/17/16;_03/18/16__
Instrument ID number:_____GCGH_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
02/29/16	GH103541.D	26.96% (RSD) (#2)	n-Butanol	-
03/17/16	CC5193-5000	-21.5% (D) (#2)	Isobutanol	-
03/17/16	CC5193-5000	-28.8% (D) (#1)	Isobutanol	-

Note: Initial and continuing calibration meets method specific criteria except for n-butyl alcohol (initial calibration) in column #2. Results reported are from column #1. Isopropanol continuing calibration verification outside method specific criteria in one of the columns. No action taken, professional judgment.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met ____
Criteria were not met
and/or see below ___X___

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
____All_method_blank_meeth_method_specific_criteria_____				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_target_analytes_detected_in_the_trip_and_field_blanks._No_target_analytes_detected_in___
_the_equipment_blank_except_for_the_following:_____

_03/17/16____JC16204-5__Aqueous/low__Isopropyl_alcohol_____258_ug/L_____

All criteria were met __X__
Criteria were not met
and/or see below ____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met ___X___
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	Hexanol	~~DBFM~~	~~TOL-d8~~	~~BFB~~	

_All_surrogate_recoveries_within_laboratory_control_limits._____
_____
_____
_____
_____
_____

QC Limits* (Aqueous)
_____LL_to_UL___ _56_to_145_ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4
DBFM = Dibromofluoromethane
TOL-d8 = Toluene-d8
BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC15796-1MS/-1MSD_____ Matrix/Level:___Groundwater_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
MS/MSD%_recoveries_and_RPD_within_laboratory_control_limits_____					

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below ____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? **Yes** or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_within_laboratory_control_limits._____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___X___
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _JC16204-2/-3_____ Matrix:__Groundwater_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC16204-1

Hexanol RF = 127.5

[ ] = (537144)/(127.5)

= 4212.9 ppb OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

_____
_____
_____
_____
_____
_____

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)