Semivolatile Organic Compounds by GC/MS - MS

Sample ID: PL18008-016MS
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acenaphthene	ND	40	37		1	91	10-133	12/30/2014 1650
Acenaphthylene	ND	40	42		1	104	34-128	12/30/2014 1650
Anthracene	ND	40	36		1	90	48-122	12/30/2014 1650
Benzo(a)anthracene	ND	40	36		1	90	53-98	12/30/2014 1650
Benzo(a)pyrene	ND	40	35		1	88	11-160	12/30/2014 1650
Benzo(b)fluoranthene	ND	40	41		1	103	10-165	12/30/2014 1650
Benzo(g,h,i)perylene	ND	40	39		1	99	42-111	12/30/2014 1650
Benzo(k)fluoranthene	ND	40	40		1	99	13-175	12/30/2014 1650
4-Bromophenyl phenyl ether	ND	40	32		1	81	49-123	12/30/2014 1650
Butyl benzyl phthalate	ND	40	40		1	101	52-142	12/30/2014 1650
Carbazole	ND	40	39		1	97	45-101	12/30/2014 1650
4-Chloro-3-methyl phenol	ND	40	35		1	89	40-98	12/30/2014 1650
4-Chloroaniline	ND	40	9.4		1	23	10-98	12/30/2014 1650
bis(2-Chloroethoxy)methane	ND	40	34		1	86	43-93	12/30/2014 1650
bis(2-Chloroisopropyl)ether	ND	40	35		1	87	36-99	12/30/2014 1650
2-Chloronaphthalene	ND	40	30		1	74	40-89	12/30/2014 1650
2-Chlorophenol	ND	40	35		1	88	33-92	12/30/2014 1650
4-Chlorophenyl phenyl ether	ND	40	35		1	86	34-124	12/30/2014 1650
Chrysene	ND	40	37		1	91	51-107	12/30/2014 1650
Dibenzo(a,h)anthracene	ND	40	42		1	104	47-116	12/30/2014 1650
Dibenzofuran	ND	40	34		1	86	45-94	12/30/2014 1650
2,4-Dichlorophenol	ND	40	35		1	89	34-105	12/30/2014 1650
Diethylphthalate	ND	40	37		1	92	48-124	12/30/2014 1650
Dimethyl phthalate	ND	40	36		1	89	43-122	12/30/2014 1650
2,4-Dimethylphenol	ND	40	51	N	1	128	33-77	12/30/2014 1650
Di-n-butyl phthalate	ND	40	37		1	93	50-134	12/30/2014 1650
4,6-Dinitro-2-methylphenol	ND	200	170		1	87	33-118	12/30/2014 1650
2,4-Dinitrophenol	ND	200	170		1	86	19-119	12/30/2014 1650
2,4-Dinitrotoluene	ND	80	78		1	97	50-104	12/30/2014 1650
2,6-Dinitrotoluene	ND	80	73		1	91	53-128	12/30/2014 1650
Di-n-octylphthalate	ND	40	39		1	97	40-112	12/30/2014 1650
bis(2-Ethylhexyl)phthalate	ND	40	39		1	99	10-142	12/30/2014 1650
Fluoranthene	ND	40	36		1	90	50-124	12/30/2014 1650
Fluorene	ND	40	35		1	88	39-122	12/30/2014 1650
Hexachlorobenzene	ND	40	34		1	85	46-125	12/30/2014 1650
Hexachlorobutadiene	ND	40	33		1	83	42-94	12/30/2014 1650
Hexachlorocyclopentadiene	ND	200	94		1	47	14-89	12/30/2014 1650
Hexachloroethane	ND	40	33		1	81	39-86	12/30/2014 1650
Indeno(1,2,3-c,d)pyrene	ND	40	40		1	100	43-113	12/30/2014 1650
Isophorone	ND	40	37	N	1	93	42-84	12/30/2014 1650
2-Methylnaphthalene	ND	40	36		1	90	40-132	12/30/2014 1650
2-Methylphenol	ND	40	40		1	99	33-122	12/30/2014 1650
3 & 4-Methylphenol	ND	80	74		1	92	24-97	12/30/2014 1650
Naphthalene	ND	40	34		1	84	46-89	12/30/2014 1650

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MS

Sample ID: PL18008-016MS
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
2-Nitroaniline	ND	80	68		1	85	48-126	12/30/2014 1650
3-Nitroaniline	ND	80	44		1	55	10-110	12/30/2014 1650
4-Nitroaniline	ND	80	69		1	87	41-99	12/30/2014 1650
Nitrobenzene	ND	40	37	N	1	92	44-91	12/30/2014 1650
2-Nitrophenol	ND	80	70		1	87	34-102	12/30/2014 1650
4-Nitrophenol	ND	200	190		1	94	29-122	12/30/2014 1650
N-Nitrosodi-n-propylamine	ND	40	38		1	96	41-96	12/30/2014 1650
N-Nitrosodiphenylamine (Diphenylamine)	ND	40	37		1	92	10-150	12/30/2014 1650
Pentachlorophenol	ND	200	160		1	82	32-110	12/30/2014 1650
Phenanthrene	ND	40	35		1	88	49-122	12/30/2014 1650
Phenol	ND	40	34		1	85	33-92	12/30/2014 1650
Pyrene	ND	40	34		1	85	50-130	12/30/2014 1650
2,4,5-Trichlorophenol	ND	40	35		1	86	46-125	12/30/2014 1650
2,4,6-Trichlorophenol	ND	40	33		1	84	36-123	12/30/2014 1650

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		86	37-129
2-Fluorophenol		84	24-127
Nitrobenzene-d5		82	38-127
Phenol-d5		86	28-128
Terphenyl-d14		95	10-148
2,4,6-Tribromophenol		79	41-144

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MSD

Sample ID: PL18008-016MD
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Acenaphthene	ND	40	29		1	72	23	10-133	40	12/30/2014 1714
Acenaphthylene	ND	40	33		1	83	22	34-128	40	12/30/2014 1714
Anthracene	ND	40	28		1	70	25	48-122	40	12/30/2014 1714
Benzo(a)anthracene	ND	40	27		1	68	27	53-98	40	12/30/2014 1714
Benzo(a)pyrene	ND	40	25		1	63	33	11-160	40	12/30/2014 1714
Benzo(b)fluoranthene	ND	40	30		1	76	30	10-165	40	12/30/2014 1714
Benzo(g,h,i)perylene	ND	40	27		1	68	37	42-111	40	12/30/2014 1714
Benzo(k)fluoranthene	ND	40	29		1	72	32	13-175	40	12/30/2014 1714
4-Bromophenyl phenyl ether	ND	40	25		1	63	25	49-123	40	12/30/2014 1714
Butyl benzyl phthalate	ND	40	31		1	77	28	52-142	40	12/30/2014 1714
Carbazole	ND	40	30		1	75	25	45-101	40	12/30/2014 1714
4-Chloro-3-methyl phenol	ND	40	28		1	70	24	40-98	40	12/30/2014 1714
4-Chloroaniline	ND	40	11		1	27	15	10-98	40	12/30/2014 1714
bis(2-Chloroethoxy)methane	ND	40	27		1	68	23	43-93	40	12/30/2014 1714
bis(2-Chloroisopropyl)ether	ND	40	27		1	68	24	36-99	40	12/30/2014 1714
2-Chloronaphthalene	ND	40	23		1	58	24	40-89	40	12/30/2014 1714
2-Chlorophenol	ND	40	28		1	70	23	33-92	40	12/30/2014 1714
4-Chlorophenyl phenyl ether	ND	40	27		1	68	24	34-124	40	12/30/2014 1714
Chrysene	ND	40	27		1	69	28	51-107	40	12/30/2014 1714
Dibenzo(a,h)anthracene	ND	40	29		1	72	37	47-116	40	12/30/2014 1714
Dibenzofuran	ND	40	27		1	68	23	45-94	40	12/30/2014 1714
2,4-Dichlorophenol	ND	40	28		1	70	23	34-105	40	12/30/2014 1714
Diethylphthalate	ND	40	28		1	71	26	48-124	40	12/30/2014 1714
Dimethyl phthalate	ND	40	28		1	70	24	43-122	40	12/30/2014 1714
2,4-Dimethylphenol	ND	40	40	N	1	99	25	33-77	40	12/30/2014 1714
Di-n-butyl phthalate	ND	40	29		1	72	25	50-134	40	12/30/2014 1714
4,6-Dinitro-2-methylphenol	ND	200	140		1	69	24	33-118	40	12/30/2014 1714
2,4-Dinitrophenol	ND	200	140		1	69	22	19-119	40	12/30/2014 1714
2,4-Dinitrotoluene	ND	80	60		1	76	25	50-104	40	12/30/2014 1714
2,6-Dinitrotoluene	ND	80	57		1	71	24	53-128	40	12/30/2014 1714
Di-n-octylphthalate	ND	40	27		1	68	36	40-112	40	12/30/2014 1714
bis(2-Ethylhexyl)phthalate	ND	40	28		1	69	36	10-142	40	12/30/2014 1714
Fluoranthene	ND	40	28		1	69	26	50-124	40	12/30/2014 1714
Fluorene	ND	40	27		1	69	24	39-122	40	12/30/2014 1714
Hexachlorobenzene	ND	40	27		1	67	24	46-125	40	12/30/2014 1714
Hexachlorobutadiene	ND	40	27		1	66	23	42-94	40	12/30/2014 1714
Hexachlorocyclopentadiene	ND	200	77		1	39	19	14-89	40	12/30/2014 1714
Hexachloroethane	ND	40	26		1	66	21	39-86	40	12/30/2014 1714
Indeno(1,2,3-c,d)pyrene	ND	40	28		1	69	37	43-113	40	12/30/2014 1714
Isophorone	ND	40	30		1	75	22	42-84	40	12/30/2014 1714
2-Methylnaphthalene	ND	40	29		1	72	22	40-132	40	12/30/2014 1714
2-Methylphenol	ND	40	31		1	78	23	33-122	40	12/30/2014 1714
3 & 4-Methylphenol	ND	80	58		1	73	23	24-97	40	12/30/2014 1714
Naphthalene	ND	40	27		1	67	22	46-89	40	12/30/2014 1714

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MSD

Sample ID: PL18008-016MD
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
2-Nitroaniline	ND	80	54		1	68	23	48-126	40	12/30/2014 1714
3-Nitroaniline	ND	80	38		1	47	16	10-110	40	12/30/2014 1714
4-Nitroaniline	ND	80	57		1	71	20	41-99	40	12/30/2014 1714
Nitrobenzene	ND	40	29		1	72	25	44-91	40	12/30/2014 1714
2-Nitrophenol	ND	80	56		1	70	22	34-102	40	12/30/2014 1714
4-Nitrophenol	ND	200	140		1	69	30	29-122	40	12/30/2014 1714
N-Nitrosodi-n-propylamine	ND	40	30		1	76	23	41-96	40	12/30/2014 1714
N-Nitrosodiphenylamine (Diphenylamine)	ND	40	31		1	76	18	10-150	40	12/30/2014 1714
Pentachlorophenol	ND	200	120		1	62	27	32-110	40	12/30/2014 1714
Phenanthrene	ND	40	27		1	69	24	49-122	40	12/30/2014 1714
Phenol	ND	40	27		1	68	23	33-92	40	12/30/2014 1714
Pyrene	ND	40	26		1	66	26	50-130	40	12/30/2014 1714
2,4,5-Trichlorophenol	ND	40	27		1	68	24	46-125	40	12/30/2014 1714
2,4,6-Trichlorophenol	ND	40	26		1	66	23	36-123	40	12/30/2014 1714

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		69	37-129
2-Fluorophenol		67	24-127
Nitrobenzene-d5		66	38-127
Phenol-d5		69	28-128
Terphenyl-d14		72	10-148
2,4,6-Tribromophenol		61	41-144

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ64207-001
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
1,1'-Biphenyl	ND		1	33	10	ug/kg	12/30/2014 1150
2,4,5-Trichlorophenol	ND		1	33	9.3	ug/kg	12/30/2014 1150
2,4,6-Trichlorophenol	ND		1	33	9.8	ug/kg	12/30/2014 1150
2,4-Dichlorophenol	ND		1	33	10	ug/kg	12/30/2014 1150
2,4-Dimethylphenol	ND		1	33	12	ug/kg	12/30/2014 1150
2,4-Dinitrophenol	ND		1	170	110	ug/kg	12/30/2014 1150
2,4-Dinitrotoluene	ND		1	67	18	ug/kg	12/30/2014 1150
2,6-Dinitrotoluene	ND		1	67	17	ug/kg	12/30/2014 1150
2-Chloronaphthalene	ND		1	33	11	ug/kg	12/30/2014 1150
2-Chlorophenol	ND		1	33	9.2	ug/kg	12/30/2014 1150
2-Methylnaphthalene	ND		1	33	9.9	ug/kg	12/30/2014 1150
2-Methylphenol	ND		1	33	6.0	ug/kg	12/30/2014 1150
2-Nitroaniline	ND		1	67	23	ug/kg	12/30/2014 1150
2-Nitrophenol	ND		1	67	18	ug/kg	12/30/2014 1150
3 & 4-Methylphenol	ND		1	67	12	ug/kg	12/30/2014 1150
3,3'-Dichlorobenzidine	ND		1	170	36	ug/kg	12/30/2014 1150
3-Nitroaniline	ND		1	67	39	ug/kg	12/30/2014 1150
4,6-Dinitro-2-methylphenol	ND		1	170	130	ug/kg	12/30/2014 1150
4-Bromophenyl phenyl ether	ND		1	33	9.8	ug/kg	12/30/2014 1150
4-Chloro-3-methyl phenol	ND		1	33	8.4	ug/kg	12/30/2014 1150
4-Chloroaniline	ND		1	33	6.8	ug/kg	12/30/2014 1150
4-Chlorophenyl phenyl ether	ND		1	33	11	ug/kg	12/30/2014 1150
4-Nitroaniline	ND		1	67	19	ug/kg	12/30/2014 1150
4-Nitrophenol	ND		1	170	96	ug/kg	12/30/2014 1150
Acenaphthene	ND		1	33	11	ug/kg	12/30/2014 1150
Acenaphthylene	ND		1	33	10	ug/kg	12/30/2014 1150
Acetophenone	ND		1	33	18	ug/kg	12/30/2014 1150
Anthracene	ND		1	33	7.4	ug/kg	12/30/2014 1150
Atrazine	ND		1	33	17	ug/kg	12/30/2014 1150
Benzaldehyde	ND		1	33	17	ug/kg	12/30/2014 1150
Benzo(a)anthracene	ND		1	33	8.8	ug/kg	12/30/2014 1150
Benzo(a)pyrene	ND		1	33	9.3	ug/kg	12/30/2014 1150
Benzo(b)fluoranthene	ND		1	33	9.6	ug/kg	12/30/2014 1150
Benzo(g,h,i)perylene	ND		1	33	12	ug/kg	12/30/2014 1150
Benzo(k)fluoranthene	ND		1	33	9.5	ug/kg	12/30/2014 1150
bis(2-Chloroethoxy)methane	ND		1	33	10	ug/kg	12/30/2014 1150
bis(2-Chloroethyl)ether	ND		1	33	9.2	ug/kg	12/30/2014 1150
bis(2-Chloroisopropyl)ether	ND		1	33	11	ug/kg	12/30/2014 1150
bis(2-Ethylhexyl)phthalate	ND		1	33	12	ug/kg	12/30/2014 1150
Butyl benzyl phthalate	ND		1	67	22	ug/kg	12/30/2014 1150
Caprolactam	ND		1	33	17	ug/kg	12/30/2014 1150
Carbazole	ND		1	33	14	ug/kg	12/30/2014 1150
Chrysene	ND		1	33	11	ug/kg	12/30/2014 1150
Di-n-butyl phthalate	ND		1	33	18	ug/kg	12/30/2014 1150

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ64207-001
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Di-n-octylphthalate	ND		1	33	32	ug/kg	12/30/2014 1150
Dibenzo(a,h)anthracene	ND		1	33	9.1	ug/kg	12/30/2014 1150
Dibenzofuran	ND		1	33	10	ug/kg	12/30/2014 1150
Diethylphthalate	ND		1	33	11	ug/kg	12/30/2014 1150
Dimethyl phthalate	ND		1	33	11	ug/kg	12/30/2014 1150
Fluoranthene	ND		1	33	11	ug/kg	12/30/2014 1150
Fluorene	ND		1	33	9.0	ug/kg	12/30/2014 1150
Hexachlorobenzene	ND		1	33	15	ug/kg	12/30/2014 1150
Hexachlorobutadiene	ND		1	33	11	ug/kg	12/30/2014 1150
Hexachlorocyclopentadiene	ND		1	170	25	ug/kg	12/30/2014 1150
Hexachloroethane	ND		1	33	8.9	ug/kg	12/30/2014 1150
Indeno(1,2,3-c,d)pyrene	ND		1	33	9.7	ug/kg	12/30/2014 1150
Isophorone	ND		1	33	7.4	ug/kg	12/30/2014 1150
N-Nitrosodi-n-propylamine	ND		1	33	13	ug/kg	12/30/2014 1150
N-Nitrosodiphenylamine (Diphenylamine)	ND		1	33	8.3	ug/kg	12/30/2014 1150
Naphthalene	ND		1	33	10	ug/kg	12/30/2014 1150
Nitrobenzene	ND		1	33	5.4	ug/kg	12/30/2014 1150
Pentachlorophenol	ND		1	170	140	ug/kg	12/30/2014 1150
Phenanthrene	ND		1	33	9.0	ug/kg	12/30/2014 1150
Phenol	ND		1	33	9.1	ug/kg	12/30/2014 1150
Pyrene	ND		1	33	13	ug/kg	12/30/2014 1150

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		42	30-117
2-Fluorobiphenyl		40	33-102
2-Fluorophenol		44	28-104
Nitrobenzene-d5		39	22-109
Phenol-d5		47	27-103
Terphenyl-d14		73	41-120

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64207-002
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
1,1'-Biphenyl	670	300		1	45	30-130	12/30/2014 1213
2,4,5-Trichlorophenol	670	400		1	60	46-122	12/30/2014 1213
2,4,6-Trichlorophenol	670	380		1	57	38-115	12/30/2014 1213
2,4-Dichlorophenol	670	320		1	48	41-113	12/30/2014 1213
2,4-Dimethylphenol	670	490		1	74	33-123	12/30/2014 1213
2,4-Dinitrophenol	3300	2300		1	70	30-130	12/30/2014 1213
2,4-Dinitrotoluene	1300	1000		1	75	48-124	12/30/2014 1213
2,6-Dinitrotoluene	1300	880		1	66	47-125	12/30/2014 1213
2-Chloronaphthalene	670	280		1	42	31-127	12/30/2014 1213
2-Chlorophenol	670	300		1	45	37-106	12/30/2014 1213
2-Methylnaphthalene	670	300		1	46	40-106	12/30/2014 1213
2-Methylphenol	670	310		1	47	32-107	12/30/2014 1213
2-Nitroaniline	1300	870		1	66	45-128	12/30/2014 1213
2-Nitrophenol	1300	550		1	41	35-108	12/30/2014 1213
3 & 4-Methylphenol	1300	670		1	50	39-108	12/30/2014 1213
3,3'-Dichlorobenzidine	1300	1000		1	76	30-130	12/30/2014 1213
3-Nitroaniline	1300	870		1	65	24-127	12/30/2014 1213
4,6-Dinitro-2-methylphenol	3300	2600		1	78	40-130	12/30/2014 1213
4-Bromophenyl phenyl ether	670	390		1	59	46-118	12/30/2014 1213
4-Chloro-3-methyl phenol	670	410		1	62	49-118	12/30/2014 1213
4-Chloroaniline	670	370		1	55	10-125	12/30/2014 1213
4-Chlorophenyl phenyl ether	670	380		1	57	47-116	12/30/2014 1213
4-Nitroaniline	1300	1100		1	86	48-127	12/30/2014 1213
4-Nitrophenol	3300	2800		1	84	18-154	12/30/2014 1213
Acenaphthene	670	360		1	54	46-114	12/30/2014 1213
Acenaphthylene	670	450		1	68	44-122	12/30/2014 1213
Acetophenone	670	280		1	42	30-130	12/30/2014 1213
Anthracene	670	500		1	76	50-119	12/30/2014 1213
Atrazine	670	450		1	67	30-130	12/30/2014 1213
Benzaldehyde	670	280		1	42	40-117	12/30/2014 1213
Benzo(a)anthracene	670	540		1	80	47-121	12/30/2014 1213
Benzo(a)pyrene	670	590		1	89	55-134	12/30/2014 1213
Benzo(b)fluoranthene	670	570		1	85	28-139	12/30/2014 1213
Benzo(g,h,i)perylene	670	540		1	81	36-125	12/30/2014 1213
Benzo(k)fluoranthene	670	590		1	89	47-130	12/30/2014 1213
bis(2-Chloroethoxy)methane	670	290		1	44	39-108	12/30/2014 1213
bis(2-Chloroethyl)ether	670	280		1	42	32-105	12/30/2014 1213
bis(2-Chloroisopropyl)ether	670	280		1	43	31-102	12/30/2014 1213
bis(2-Ethylhexyl)phthalate	670	570		1	85	45-128	12/30/2014 1213
Butyl benzyl phthalate	670	570		1	86	46-128	12/30/2014 1213
Caprolactam	670	650		1	98	30-130	12/30/2014 1213
Carbazole	670	570		1	86	30-130	12/30/2014 1213
Chrysene	670	550		1	82	45-126	12/30/2014 1213
Di-n-butyl phthalate	670	550		1	82	51-129	12/30/2014 1213

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64207-002
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Di-n-octylphthalate	670	550		1	82	49-142	12/30/2014 1213
Dibenzo(a,h)anthracene	670	540		1	81	30-130	12/30/2014 1213
Dibenzofuran	670	370		1	56	45-112	12/30/2014 1213
Diethylphthalate	670	500		1	75	49-123	12/30/2014 1213
Dimethyl phthalate	670	460		1	69	48-120	12/30/2014 1213
Fluoranthene	670	540		1	80	50-123	12/30/2014 1213
Fluorene	670	420		1	63	48-117	12/30/2014 1213
Hexachlorobenzene	670	490		1	73	44-122	12/30/2014 1213
Hexachlorobutadiene	670	250		1	37	33-103	12/30/2014 1213
Hexachlorocyclopentadiene	3300	1300		1	39	18-121	12/30/2014 1213
Hexachloroethane	670	240		1	36	30-96	12/30/2014 1213
Indeno(1,2,3-c,d)pyrene	670	530		1	80	45-123	12/30/2014 1213
Isophorone	670	330		1	49	30-130	12/30/2014 1213
N-Nitrosodi-n-propylamine	670	310		1	46	32-115	12/30/2014 1213
N-Nitrosodiphenylamine (Diphenylamine)	670	570		1	86	53-150	12/30/2014 1213
Naphthalene	670	270		1	41	36-110	12/30/2014 1213
Nitrobenzene	670	280		1	42	33-114	12/30/2014 1213
Pentachlorophenol	3300	2200		1	65	27-138	12/30/2014 1213
Phenanthrene	670	470		1	71	49-117	12/30/2014 1213
Phenol	670	320		1	48	36-108	12/30/2014 1213
Pyrene	670	530		1	79	47-119	12/30/2014 1213

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		69	30-117
2-Fluorobiphenyl		46	33-102
2-Fluorophenol		42	28-104
Nitrobenzene-d5		41	22-109
Phenol-d5		46	27-103
Terphenyl-d14		85	41-120

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MS

Sample ID: PL18008-021MS
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acenaphthene	ND	800	470		1	59	30-130	01/02/2015 1235
Acenaphthylene	ND	800	630		1	79	30-130	01/02/2015 1235
Acetophenone	ND	800	460		1	58	30-130	01/02/2015 1235
Anthracene	ND	800	620		1	77	30-130	01/02/2015 1235
Atrazine	ND	800	500		1	63	30-130	01/02/2015 1235
Benzaldehyde	ND	800	360		1	45	40-117	01/02/2015 1235
Benzo(a)anthracene	13	800	660		1	81	30-130	01/02/2015 1235
Benzo(a)pyrene	11	800	740		1	93	30-130	01/02/2015 1235
Benzo(b)fluoranthene	15	800	730		1	90	30-130	01/02/2015 1235
Benzo(g,h,i)perylene	14	800	670		1	83	30-130	01/02/2015 1235
Benzo(k)fluoranthene	ND	800	710		1	89	30-130	01/02/2015 1235
1,1'-Biphenyl	ND	800	450		1	56	30-130	01/02/2015 1235
4-Bromophenyl phenyl ether	ND	800	490		1	61	30-130	01/02/2015 1235
Butyl benzyl phthalate	ND	800	700		1	87	30-130	01/02/2015 1235
Caprolactam	ND	800	780		1	97	30-130	01/02/2015 1235
Carbazole	ND	800	690		1	86	30-130	01/02/2015 1235
4-Chloro-3-methyl phenol	ND	800	550		1	68	30-130	01/02/2015 1235
4-Chloroaniline	ND	800	160		1	20	10-130	01/02/2015 1235
bis(2-Chloroethoxy)methane	ND	800	470		1	58	30-130	01/02/2015 1235
bis(2-Chloroethyl)ether	ND	800	380		1	48	30-130	01/02/2015 1235
bis(2-Chloroisopropyl)ether	ND	800	410		1	51	30-130	01/02/2015 1235
2-Chloronaphthalene	ND	800	410		1	51	30-130	01/02/2015 1235
2-Chlorophenol	ND	800	500		1	62	30-130	01/02/2015 1235
4-Chlorophenyl phenyl ether	ND	800	490		1	61	30-130	01/02/2015 1235
Chrysene	ND	800	690		1	86	30-130	01/02/2015 1235
Dibenzo(a,h)anthracene	ND	800	660		1	83	30-130	01/02/2015 1235
Dibenzofuran	ND	800	500		1	62	30-130	01/02/2015 1235
3,3'-Dichlorobenzidine	ND	1600	1100		1	67	30-130	01/02/2015 1235
2,4-Dichlorophenol	ND	800	510		1	64	30-130	01/02/2015 1235
Diethylphthalate	ND	800	600		1	75	30-130	01/02/2015 1235
Dimethyl phthalate	ND	800	590		1	74	30-130	01/02/2015 1235
2,4-Dimethylphenol	ND	800	760		1	95	30-130	01/02/2015 1235
Di-n-butyl phthalate	ND	800	680		1	85	30-130	01/02/2015 1235
4,6-Dinitro-2-methylphenol	ND	4000	2900		1	73	30-130	01/02/2015 1235
2,4-Dinitrophenol	ND	4000	2800		1	71	30-130	01/02/2015 1235
2,4-Dinitrotoluene	ND	1600	1200		1	77	30-130	01/02/2015 1235
2,6-Dinitrotoluene	ND	1600	1100		1	71	30-130	01/02/2015 1235
Di-n-octylphthalate	ND	800	650		1	82	30-130	01/02/2015 1235
bis(2-Ethylhexyl)phthalate	ND	800	710		1	88	30-130	01/02/2015 1235
Fluoranthene	15	800	670		1	82	30-130	01/02/2015 1235
Fluorene	ND	800	520		1	65	30-130	01/02/2015 1235
Hexachlorobenzene	ND	800	570		1	71	30-130	01/02/2015 1235
Hexachlorobutadiene	ND	800	380		1	48	30-130	01/02/2015 1235
Hexachlorocyclopentadiene	ND	4000	1100	N	1	27	30-130	01/02/2015 1235

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MS

Sample ID: PL18008-021MS
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexachloroethane	ND	800	310		1	38	30-130	01/02/2015 1235
Indeno(1,2,3-c,d)pyrene	ND	800	680		1	84	30-130	01/02/2015 1235
Isophorone	ND	800	460		1	57	30-130	01/02/2015 1235
2-Methylnaphthalene	ND	800	460		1	58	30-130	01/02/2015 1235
2-Methylphenol	ND	800	510		1	64	30-130	01/02/2015 1235
3 & 4-Methylphenol	ND	1600	1000		1	64	30-130	01/02/2015 1235
Naphthalene	ND	800	410		1	51	30-130	01/02/2015 1235
2-Nitroaniline	ND	1600	1200		1	73	30-130	01/02/2015 1235
3-Nitroaniline	ND	1600	820		1	51	30-130	01/02/2015 1235
4-Nitroaniline	ND	1600	1300		1	81	30-130	01/02/2015 1235
Nitrobenzene	ND	800	410		1	51	30-130	01/02/2015 1235
2-Nitrophenol	ND	1600	940		1	59	30-130	01/02/2015 1235
4-Nitrophenol	ND	4000	3200		1	79	30-130	01/02/2015 1235
N-Nitrosodi-n-propylamine	ND	800	420		1	53	30-130	01/02/2015 1235
N-Nitrosodiphenylamine (Diphenylamine)	ND	800	680		1	85	30-130	01/02/2015 1235
Pentachlorophenol	ND	4000	2500		1	62	30-130	01/02/2015 1235
Phenanthrene	ND	800	590		1	73	30-130	01/02/2015 1235
Phenol	12	800	500		1	61	30-130	01/02/2015 1235
Pyrene	ND	800	630		1	79	30-130	01/02/2015 1235
2,4,5-Trichlorophenol	ND	800	530		1	66	30-130	01/02/2015 1235
2,4,6-Trichlorophenol	ND	800	540		1	67	30-130	01/02/2015 1235

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		58	33-102
2-Fluorophenol		60	28-104
Nitrobenzene-d5		52	22-109
Phenol-d5		65	27-103
Terphenyl-d14		90	41-120
2,4,6-Tribromophenol		77	30-117

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MSD

Sample ID: PL18008-021MD
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Acenaphthene	ND	820	640		1	78	30	30-130	40	01/02/2015 1258
Acenaphthylene	ND	820	820		1	100	26	30-130	40	01/02/2015 1258
Acetophenone	ND	820	600		1	73	26	30-130	40	01/02/2015 1258
Anthracene	ND	820	770		1	94	22	30-130	40	01/02/2015 1258
Atrazine	ND	820	600		1	73	17	30-130	40	01/02/2015 1258
Benzaldehyde	ND	820	470		1	57	25	40-117	40	01/02/2015 1258
Benzo(a)anthracene	13	820	800		1	96	20	30-130	40	01/02/2015 1258
Benzo(a)pyrene	11	820	910		1	111	20	30-130	40	01/02/2015 1258
Benzo(b)fluoranthene	15	820	890		1	107	19	30-130	40	01/02/2015 1258
Benzo(g,h,i)perylene	14	820	790		1	97	17	30-130	40	01/02/2015 1258
Benzo(k)fluoranthene	ND	820	870		1	107	21	30-130	40	01/02/2015 1258
1,1'-Biphenyl	ND	820	580		1	70	24	30-130	40	01/02/2015 1258
4-Bromophenyl phenyl ether	ND	820	650		1	79	28	30-130	40	01/02/2015 1258
Butyl benzyl phthalate	ND	820	840		1	103	19	30-130	40	01/02/2015 1258
Caprolactam	ND	820	1000		1	121	25	30-130	40	01/02/2015 1258
Carbazole	ND	820	850		1	104	20	30-130	40	01/02/2015 1258
4-Chloro-3-methyl phenol	ND	820	710		1	87	26	30-130	40	01/02/2015 1258
4-Chloroaniline	ND	820	210		1	25	25	10-130	40	01/02/2015 1258
bis(2-Chloroethoxy)methane	ND	820	610		1	74	26	30-130	40	01/02/2015 1258
bis(2-Chloroethyl)ether	ND	820	510		1	63	29	30-130	40	01/02/2015 1258
bis(2-Chloroisopropyl)ether	ND	820	540		1	66	28	30-130	40	01/02/2015 1258
2-Chloronaphthalene	ND	820	520		1	63	22	30-130	40	01/02/2015 1258
2-Chlorophenol	ND	820	660		1	81	29	30-130	40	01/02/2015 1258
4-Chlorophenyl phenyl ether	ND	820	630		1	77	25	30-130	40	01/02/2015 1258
Chrysene	ND	820	840		1	102	20	30-130	40	01/02/2015 1258
Dibenzo(a,h)anthracene	ND	820	800		1	98	19	30-130	40	01/02/2015 1258
Dibenzofuran	ND	820	640		1	78	25	30-130	40	01/02/2015 1258
3,3'-Dichlorobenzidine	ND	1600	1300		1	80	21	30-130	40	01/02/2015 1258
2,4-Dichlorophenol	ND	820	670		1	81	26	30-130	40	01/02/2015 1258
Diethylphthalate	ND	820	760		1	92	23	30-130	40	01/02/2015 1258
Dimethyl phthalate	ND	820	750		1	92	24	30-130	40	01/02/2015 1258
2,4-Dimethylphenol	ND	820	970		1	119	24	30-130	40	01/02/2015 1258
Di-n-butyl phthalate	ND	820	830		1	101	19	30-130	40	01/02/2015 1258
4,6-Dinitro-2-methylphenol	ND	4100	3900		1	94	27	30-130	40	01/02/2015 1258
2,4-Dinitrophenol	ND	4100	3700		1	89	25	30-130	40	01/02/2015 1258
2,4-Dinitrotoluene	ND	1600	1600		1	97	24	30-130	40	01/02/2015 1258
2,6-Dinitrotoluene	ND	1600	1500		1	91	27	30-130	40	01/02/2015 1258
Di-n-octylphthalate	ND	820	800		1	97	20	30-130	40	01/02/2015 1258
bis(2-Ethylhexyl)phthalate	ND	820	860		1	105	19	30-130	40	01/02/2015 1258
Fluoranthene	15	820	820		1	98	19	30-130	40	01/02/2015 1258
Fluorene	ND	820	680		1	82	25	30-130	40	01/02/2015 1258
Hexachlorobenzene	ND	820	740		1	90	26	30-130	40	01/02/2015 1258
Hexachlorobutadiene	ND	820	490		1	60	25	30-130	40	01/02/2015 1258
Hexachlorocyclopentadiene	ND	4100	1700	+	1	41	42	30-130	40	01/02/2015 1258

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MSD

Sample ID: PL18008-021MD
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Hexachloroethane	ND	820	420		1	52	32	30-130	40	01/02/2015 1258
Indeno(1,2,3-c,d)pyrene	ND	820	800		1	98	17	30-130	40	01/02/2015 1258
Isophorone	ND	820	610		1	74	27	30-130	40	01/02/2015 1258
2-Methylnaphthalene	ND	820	590		1	71	24	30-130	40	01/02/2015 1258
2-Methylphenol	ND	820	670		1	81	26	30-130	40	01/02/2015 1258
3 & 4-Methylphenol	ND	1600	1300		1	82	28	30-130	40	01/02/2015 1258
Naphthalene	ND	820	540		1	65	26	30-130	40	01/02/2015 1258
2-Nitroaniline	ND	1600	1600		1	95	28	30-130	40	01/02/2015 1258
3-Nitroaniline	ND	1600	930		1	57	13	30-130	40	01/02/2015 1258
4-Nitroaniline	ND	1600	1600		1	97	20	30-130	40	01/02/2015 1258
Nitrobenzene	ND	820	530		1	64	25	30-130	40	01/02/2015 1258
2-Nitrophenol	ND	1600	1200		1	76	28	30-130	40	01/02/2015 1258
4-Nitrophenol	ND	4100	3800		1	93	19	30-130	40	01/02/2015 1258
N-Nitrosodi-n-propylamine	ND	820	560		1	68	27	30-130	40	01/02/2015 1258
N-Nitrosodiphenylamine (Diphenylamine)	ND	820	870		1	106	24	30-130	40	01/02/2015 1258
Pentachlorophenol	ND	4100	3100		1	76	22	30-130	40	01/02/2015 1258
Phenanthrene	ND	820	740		1	90	23	30-130	40	01/02/2015 1258
Phenol	12	820	650		1	78	26	30-130	40	01/02/2015 1258
Pyrene	ND	820	760		1	93	19	30-130	40	01/02/2015 1258
2,4,5-Trichlorophenol	ND	820	710		1	86	29	30-130	40	01/02/2015 1258
2,4,6-Trichlorophenol	ND	820	720		1	88	29	30-130	40	01/02/2015 1258

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		69	33-102
2-Fluorophenol		76	28-104
Nitrobenzene-d5		65	22-109
Phenol-d5		80	27-103
Terphenyl-d14		103	41-120
2,4,6-Tribromophenol		93	30-117

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MB

Sample ID: PQ63824-001
Batch: 63824
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/23/2014 1200

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
4,4'-DDD	ND		1	0.025	0.0010	ug/L	12/26/2014 1914
4,4'-DDE	ND		1	0.025	0.011	ug/L	12/26/2014 1914
4,4'-DDT	ND		1	0.025	0.0020	ug/L	12/26/2014 1914
Aldrin	ND		1	0.025	0.0017	ug/L	12/26/2014 1914
alpha-BHC	0.0016	J	1	0.025	0.0010	ug/L	12/26/2014 1914
alpha-Chlordane	ND		1	0.025	0.0013	ug/L	12/26/2014 1914
beta-BHC	ND		1	0.025	0.0039	ug/L	12/26/2014 1914
delta-BHC	0.0011	J	1	0.025	0.0011	ug/L	12/26/2014 1914
Dieldrin	ND		1	0.025	0.0010	ug/L	12/26/2014 1914
Endosulfan I	ND		1	0.025	0.0022	ug/L	12/26/2014 1914
Endosulfan II	ND		1	0.025	0.0015	ug/L	12/26/2014 1914
Endosulfan sulfate	ND		1	0.025	0.0011	ug/L	12/26/2014 1914
Endrin	0.0010	J	1	0.025	0.0010	ug/L	12/26/2014 1914
Endrin aldehyde	ND		1	0.025	0.0019	ug/L	12/26/2014 1914
Endrin ketone	ND		1	0.025	0.0012	ug/L	12/26/2014 1914
gamma-BHC (Lindane)	0.0026	J	1	0.025	0.0011	ug/L	12/26/2014 1914
gamma-Chlordane	ND		1	0.025	0.0015	ug/L	12/26/2014 1914
Heptachlor	ND		1	0.025	0.013	ug/L	12/26/2014 1914
Heptachlor epoxide	ND		1	0.025	0.0020	ug/L	12/26/2014 1914
Methoxychlor	ND		1	0.10	0.0020	ug/L	12/26/2014 1914
Toxaphene	ND		1	0.25	0.11	ug/L	12/26/2014 1914

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		81	10-122
Tetrachloro-m-xylene		84	46-119

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - LCS

Sample ID: PQ63824-002
Batch: 63824
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/23/2014 1200

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
4,4'-DDD	0.50	0.47		1	95	70-130	12/26/2014 1930
4,4'-DDE	0.50	0.44		1	89	70-130	12/26/2014 1930
4,4'-DDT	0.50	0.54		1	108	70-130	12/26/2014 1930
Aldrin	0.50	0.44		1	88	70-130	12/26/2014 1930
alpha-BHC	0.50	0.44		1	88	70-130	12/26/2014 1930
alpha-Chlordane	0.50	0.45		1	90	70-130	12/26/2014 1930
beta-BHC	0.50	0.43		1	86	70-130	12/26/2014 1930
delta-BHC	0.50	0.46		1	92	70-130	12/26/2014 1930
Dieldrin	0.50	0.46		1	93	70-130	12/26/2014 1930
Endosulfan I	0.50	0.46		1	91	70-130	12/26/2014 1930
Endosulfan II	0.50	0.48		1	96	70-130	12/26/2014 1930
Endosulfan sulfate	0.50	0.44		1	89	70-130	12/26/2014 1930
Endrin	0.50	0.44		1	89	70-130	12/26/2014 1930
Endrin aldehyde	0.50	0.48		1	96	70-130	12/26/2014 1930
Endrin ketone	0.50	0.51		1	103	70-130	12/26/2014 1930
gamma-BHC (Lindane)	0.50	0.55		1	110	70-130	12/26/2014 1930
gamma-Chlordane	0.50	0.45		1	91	70-130	12/26/2014 1930
Heptachlor	0.50	0.41		1	82	70-130	12/26/2014 1930
Heptachlor epoxide	0.50	0.44		1	87	70-130	12/26/2014 1930
Methoxychlor	0.50	0.52		1	104	70-130	12/26/2014 1930

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		79	10-122
Tetrachloro-m-xylene		83	46-119

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MS

Sample ID: PL18008-019MS
Batch: 63824
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/23/2014 1200

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Aldrin	ND	1.0	0.85		1	85	70-130	12/26/2014 2113
gamma-BHC (Lindane)	0.0020	1.0	0.84		1	83	70-130	12/26/2014 2113
alpha-BHC	0.0015	1.0	0.74		1	73	70-130	12/26/2014 2113
beta-BHC	ND	1.0	0.79		1	79	70-130	12/26/2014 2113
delta-BHC	0.0015	1.0	0.90		1	90	70-130	12/26/2014 2113
alpha-Chlordane	ND	1.0	0.87		1	87	70-130	12/26/2014 2113
gamma-Chlordane	ND	1.0	0.88		1	88	70-130	12/26/2014 2113
4,4'-DDD	ND	1.0	0.94		1	94	70-130	12/26/2014 2113
4,4'-DDE	ND	1.0	0.86		1	86	70-130	12/26/2014 2113
4,4'-DDT	ND	1.0	1.1		1	110	70-130	12/26/2014 2113
Dieldrin	ND	1.0	0.89		1	89	70-130	12/26/2014 2113
Endosulfan I	ND	1.0	0.87		1	87	70-130	12/26/2014 2113
Endosulfan II	ND	1.0	0.94		1	94	70-130	12/26/2014 2113
Endosulfan sulfate	ND	1.0	0.92		1	92	70-130	12/26/2014 2113
Endrin	0.0010	1.0	0.89		1	88	70-130	12/26/2014 2113
Endrin aldehyde	0.0019	1.0	1.1		1	109	70-130	12/26/2014 2113
Endrin ketone	ND	1.0	1.1		1	110	70-130	12/26/2014 2113
Heptachlor	ND	1.0	0.75		1	75	70-130	12/26/2014 2113
Heptachlor epoxide	ND	1.0	0.85		1	85	70-130	12/26/2014 2113
Methoxychlor	ND	1.0	1.1		1	110	70-130	12/26/2014 2113

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		79	10-122
Tetrachloro-m-xylene		71	46-119

PQL = Practical quantitation limit

ND = Not detected at or above the MDL

P = The RPD between two GC columns exceeds 40%

J = Estimated result < PQL and ≥ MDL

N = Recovery is out of criteria

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MSD

Sample ID: PL18008-019MD
Batch: 63824
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/23/2014 1200

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Aldrin	ND	1.0	0.86		1	86	1.0	70-130	30	12/26/2014 2128
gamma-BHC (Lindane)	0.0020	1.0	0.88		1	88	5.2	70-130	30	12/26/2014 2128
alpha-BHC	0.0015	1.0	0.75		1	75	2.0	70-130	30	12/26/2014 2128
beta-BHC	ND	1.0	0.80		1	80	2.3	70-130	30	12/26/2014 2128
delta-BHC	0.0015	1.0	0.92		1	92	2.9	70-130	30	12/26/2014 2128
alpha-Chlordane	ND	1.0	0.90		1	90	2.9	70-130	30	12/26/2014 2128
gamma-Chlordane	ND	1.0	0.90		1	90	2.1	70-130	30	12/26/2014 2128
4,4'-DDD	ND	1.0	0.95		1	95	2.0	70-130	30	12/26/2014 2128
4,4'-DDE	ND	1.0	0.89		1	89	2.8	70-130	30	12/26/2014 2128
4,4'-DDT	ND	1.0	1.1		1	112	1.6	70-130	30	12/26/2014 2128
Dieldrin	ND	1.0	0.92		1	92	3.7	70-130	30	12/26/2014 2128
Endosulfan I	ND	1.0	0.89		1	89	2.5	70-130	30	12/26/2014 2128
Endosulfan II	ND	1.0	0.95		1	95	1.1	70-130	30	12/26/2014 2128
Endosulfan sulfate	ND	1.0	0.93		1	93	1.5	70-130	30	12/26/2014 2128
Endrin	0.0010	1.0	0.90		1	90	1.9	70-130	30	12/26/2014 2128
Endrin aldehyde	0.0019	1.0	1.1		1	109	0.092	70-130	30	12/26/2014 2128
Endrin ketone	ND	1.0	1.1		1	112	2.3	70-130	30	12/26/2014 2128
Heptachlor	ND	1.0	0.77		1	77	1.7	70-130	30	12/26/2014 2128
Heptachlor epoxide	ND	1.0	0.88		1	88	3.0	70-130	30	12/26/2014 2128
Methoxychlor	ND	1.0	1.1		1	112	1.2	70-130	30	12/26/2014 2128

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		76	10-122
Tetrachloro-m-xylene		72	46-119

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MB

Sample ID: PQ64120-001
Batch: 64120
Analytical Method: 8081B

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 930

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
4,4'-DDD	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
4,4'-DDE	ND		1	1.7	0.32	ug/kg	01/07/2015 1043
4,4'-DDT	ND		1	1.7	0.070	ug/kg	01/07/2015 1043
Aldrin	ND		1	1.7	0.042	ug/kg	01/07/2015 1043
alpha-BHC	ND		1	1.7	0.045	ug/kg	01/07/2015 1043
alpha-Chlordane	ND		1	1.7	0.028	ug/kg	01/07/2015 1043
beta-BHC	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
delta-BHC	ND		1	1.7	0.021	ug/kg	01/07/2015 1043
Dieldrin	ND		1	1.7	0.028	ug/kg	01/07/2015 1043
Endosulfan I	ND		1	1.7	0.041	ug/kg	01/07/2015 1043
Endosulfan II	ND		1	1.7	0.032	ug/kg	01/07/2015 1043
Endosulfan sulfate	ND		1	1.7	0.037	ug/kg	01/07/2015 1043
Endrin	ND		1	1.7	0.022	ug/kg	01/07/2015 1043
Endrin aldehyde	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
Endrin ketone	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
gamma-BHC (Lindane)	ND		1	1.7	0.075	ug/kg	01/07/2015 1043
gamma-Chlordane	ND		1	1.7	0.025	ug/kg	01/07/2015 1043
Heptachlor	ND		1	1.7	0.057	ug/kg	01/07/2015 1043
Heptachlor epoxide	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
Methoxychlor	ND		1	6.7	0.067	ug/kg	01/07/2015 1043
Toxaphene	ND		1	83	1.7	ug/kg	01/07/2015 1043

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		75	57-110
Tetrachloro-m-xylene		60	37-91

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - LCS

Sample ID: PQ64120-002
Batch: 64120
Analytical Method: 8081B

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 930

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
4,4'-DDD	17	15		1	91	70-130	01/07/2015 1057
4,4'-DDE	17	15		1	89	70-130	01/07/2015 1057
4,4'-DDT	17	15		1	87	70-130	01/07/2015 1057
Aldrin	17	15		1	87	70-130	01/07/2015 1057
alpha-BHC	17	14		1	80	70-130	01/07/2015 1057
alpha-Chlordane	17	15		1	88	70-130	01/07/2015 1057
beta-BHC	17	13		1	79	70-130	01/07/2015 1057
delta-BHC	17	14		1	82	70-130	01/07/2015 1057
Dieldrin	17	16		1	92	70-130	01/07/2015 1057
Endosulfan I	17	15		1	88	70-130	01/07/2015 1057
Endosulfan II	17	15		1	90	70-130	01/07/2015 1057
Endosulfan sulfate	17	14		1	84	70-130	01/07/2015 1057
Endrin	17	15		1	90	70-130	01/07/2015 1057
Endrin aldehyde	17	14		1	81	70-130	01/07/2015 1057
Endrin ketone	17	15		1	87	70-130	01/07/2015 1057
gamma-BHC (Lindane)	17	14		1	84	70-130	01/07/2015 1057
gamma-Chlordane	17	15		1	86	70-130	01/07/2015 1057
Heptachlor	17	14		1	80	70-130	01/07/2015 1057
Heptachlor epoxide	17	14		1	85	70-130	01/07/2015 1057
Methoxychlor	17	15		1	88	70-130	01/07/2015 1057

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		75	57-110
Tetrachloro-m-xylene		60	37-91

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ63790-001
Batch: 63790
Analytical Method: 6010C

Matrix: Solid
Prep Method: 3050B
Prep Date: 12/23/2014 901

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Arsenic	ND		1	0.50	0.19	mg/kg	12/26/2014 1645
Barium	ND		1	1.3	0.091	mg/kg	12/26/2014 1645
Cadmium	ND		1	0.10	0.011	mg/kg	12/26/2014 1645
Chromium	ND		1	0.25	0.051	mg/kg	12/26/2014 1645
Lead	ND		1	0.50	0.093	mg/kg	12/26/2014 1645
Selenium	ND		1	0.50	0.17	mg/kg	12/26/2014 1645
Silver	ND		1	0.25	0.042	mg/kg	12/26/2014 1645

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ63790-002
Batch: 63790
Analytical Method: 6010C

Matrix: Solid
Prep Method: 3050B
Prep Date: 12/23/2014 901

Parameter	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	230	220		1	96	80-120	12/26/2014 1653
Barium	460	460		1	101	80-120	12/26/2014 1653
Cadmium	46	45		1	99	80-120	12/26/2014 1653
Chromium	230	230		1	101	80-120	12/26/2014 1653
Lead	230	230		1	99	80-120	12/26/2014 1653
Selenium	46	43		1	94	80-120	12/26/2014 1653
Silver	230	230		5	99	80-120	12/26/2014 1708

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ63838-001
Batch: 63838
Analytical Method: 6010C
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Arsenic	ND		1	0.010	0.0040	mg/L	12/30/2014 1127
Barium	ND		1	0.025	0.0075	mg/L	12/30/2014 1127
Cadmium	ND		1	0.0020	0.00060	mg/L	12/30/2014 1127
Chromium	ND		1	0.0050	0.0021	mg/L	12/30/2014 1127
Lead	ND		1	0.010	0.0019	mg/L	12/30/2014 1127
Selenium	ND		1	0.010	0.0026	mg/L	12/30/2014 1127
Silver	ND		1	0.0050	0.00040	mg/L	12/30/2014 1127

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ63838-002
Batch: 63838
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	0.40	0.38		5	96	80-120	12/30/2014 1131
Barium	2.0	2.0		5	99	80-120	12/30/2014 1131
Cadmium	0.40	0.39		5	96	80-120	12/30/2014 1131
Chromium	2.0	1.9		5	94	80-120	12/30/2014 1131
Lead	0.40	0.42		5	105	80-120	12/30/2014 1131
Selenium	0.40	0.39		5	97	80-120	12/30/2014 1131
Silver	0.40	0.40		5	99	80-120	12/30/2014 1131

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MS

Sample ID: PL18008-012MS
Batch: 63838
Analytical Method: 6010C
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	ND	0.40	0.39		5	97	75-125	12/30/2014 1224
Barium	0.040	2.0	2.1		5	101	75-125	12/30/2014 1224
Cadmium	ND	0.40	0.39		5	97	75-125	12/30/2014 1224
Chromium	ND	2.0	1.9		5	97	75-125	12/30/2014 1224
Lead	0.0061	0.40	0.43		5	107	75-125	12/30/2014 1224
Selenium	ND	0.40	0.38		5	94	75-125	12/30/2014 1224
Silver	0.00040	0.40	0.37		5	92	75-125	12/30/2014 1224

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MSD

Sample ID: PL18008-012MD
Batch: 63838
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Arsenic	ND	0.40	0.36		5	90	8.1	75-125	20	12/30/2014 1228
Barium	0.040	2.0	2.0		5	96	5.1	75-125	20	12/30/2014 1228
Cadmium	ND	0.40	0.37		5	92	5.3	75-125	20	12/30/2014 1228
Chromium	ND	2.0	1.8		5	92	5.3	75-125	20	12/30/2014 1228
Lead	0.0061	0.40	0.41		5	102	5.0	75-125	20	12/30/2014 1228
Selenium	ND	0.40	0.39		5	96	2.1	75-125	20	12/30/2014 1228
Silver	0.00040	0.40	0.39		5	97	4.9	75-125	20	12/30/2014 1228

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MB

Sample ID: PQ63838-001
Batch: 63838
Analytical Method: 6010C
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Arsenic	ND		1	0.010	0.0040	mg/L	12/30/2014 1127
Dissolved Barium	ND		1	0.025	0.0075	mg/L	12/30/2014 1127
Dissolved Cadmium	ND		1	0.0020	0.00060	mg/L	12/30/2014 1127
Dissolved Chromium	ND		1	0.0050	0.0021	mg/L	12/30/2014 1127
Dissolved Lead	ND		1	0.010	0.0019	mg/L	12/30/2014 1127
Dissolved Selenium	ND		1	0.010	0.0026	mg/L	12/30/2014 1127
Dissolved Silver	ND		1	0.0050	0.00040	mg/L	12/30/2014 1127

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - LCS

Sample ID: PQ63838-002
Batch: 63838
Analytical Method: 6010C
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Arsenic	0.40	0.38		5	96	80-120	12/30/2014 1131
Dissolved Barium	2.0	2.0		5	99	80-120	12/30/2014 1131
Dissolved Cadmium	0.40	0.39		5	96	80-120	12/30/2014 1131
Dissolved Chromium	2.0	1.9		5	94	80-120	12/30/2014 1131
Dissolved Lead	0.40	0.42		5	105	80-120	12/30/2014 1131
Dissolved Selenium	0.40	0.39		5	97	80-120	12/30/2014 1131
Dissolved Silver	0.40	0.40		5	99	80-120	12/30/2014 1131

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MS

Sample ID: PL18008-012MS
Batch: 63838
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Arsenic	ND	0.40	0.38		5	96	75-125	12/30/2014 1240
Dissolved Barium	0.036	2.0	2.1		5	101	75-125	12/30/2014 1240
Dissolved Cadmium	ND	0.40	0.39		5	97	75-125	12/30/2014 1240
Dissolved Chromium	ND	2.0	1.9		5	97	75-125	12/30/2014 1240
Dissolved Lead	0.0041	0.40	0.43		5	106	75-125	12/30/2014 1240
Dissolved Selenium	ND	0.40	0.38		5	96	75-125	12/30/2014 1240
Dissolved Silver	ND	0.40	0.38		5	95	75-125	12/30/2014 1240

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MSD

Sample ID: PL18008-012MD
Batch: 63838
Analytical Method: 6010C
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Dissolved Arsenic	ND	0.40	0.41		5	102	6.8	75-125	20	12/30/2014 2049
Dissolved Barium	0.036	2.0	2.2		5	109	7.5	75-125	20	12/30/2014 2049
Dissolved Cadmium	ND	0.40	0.40		5	101	4.0	75-125	20	12/30/2014 2049
Dissolved Chromium	ND	2.0	2.0		5	102	5.4	75-125	20	12/30/2014 2049
Dissolved Lead	0.0041	0.40	0.45		5	110	3.9	75-125	20	12/30/2014 2049
Dissolved Selenium	ND	0.40	0.41		5	104	8.0	75-125	20	12/30/2014 2049
Dissolved Silver	ND	0.40	0.39		5	97	1.8	75-125	20	12/30/2014 2049

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MB

Sample ID: QQ64841-001
Batch: 64841
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 01/08/2015 1415

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Arsenic	ND		1	1.0	0.26	ug/L	01/09/2015 0207
Barium	0.29	J	1	5.0	0.045	ug/L	01/09/2015 0207
Cadmium	ND		1	0.10	0.059	ug/L	01/09/2015 0207
Chromium	ND		1	5.0	0.35	ug/L	01/09/2015 0207
Lead	ND		1	1.0	0.047	ug/L	01/09/2015 0207
Selenium	ND		1	1.0	0.25	ug/L	01/09/2015 0207
Silver	ND		1	1.0	0.011	ug/L	01/09/2015 1743

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - LCS

Sample ID: QQ64841-002
Batch: 64841
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 01/08/2015 1415

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	100	100		1	101	80-120	01/09/2015 0212
Barium	100	100		1	105	80-120	01/09/2015 0212
Cadmium	100	100		1	101	80-120	01/09/2015 0212
Chromium	100	98		1	98	80-120	01/09/2015 0212
Lead	100	100		1	101	80-120	01/09/2015 0212
Selenium	100	100		1	100	80-120	01/09/2015 0212
Silver	100	110		1	109	80-120	01/09/2015 1748

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ64167-001
Batch: 64167
Analytical Method: 7471B

Matrix: Solid
Prep Method: 7471B
Prep Date: 12/30/2014 1244

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	0.0092	J	1	0.083	0.0059	mg/kg	12/31/2014 1217

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ64167-002
Batch: 64167
Analytical Method: 7471B
Matrix: Solid
Prep Method: 7471B
Prep Date: 12/30/2014 1244

Parameter	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.78	0.83		1	107	80-120	12/31/2014 1219

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MS

Sample ID: PL18008-021MS
Batch: 64167
Analytical Method: 7471B

Matrix: Solid
Prep Method: 7471B
Prep Date: 12/30/2014 1244

Parameter	Sample Amount (mg/kg)	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	ND	0.90	0.85		1	95	80-120	12/31/2014 1231

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MSD

Sample ID: PL18008-021MD
Batch: 64167
Analytical Method: 7471B

Matrix: Solid
Prep Method: 7471B
Prep Date: 12/30/2014 1244

Parameter	Sample Amount (mg/kg)	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Mercury	ND	1.0	0.99		1	98	15	80-120	20	12/31/2014 1237

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

CVAA - MB

Sample ID: PQ64180-001
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	ND		1	0.00010	0.000015	mg/L	12/29/2014 1752

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

CVAA - LCS

Sample ID: PQ64180-002
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.0020	0.0019		1	94	85-115	12/29/2014 1753

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ64180-001
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	ND		1	0.00010	0.000015	mg/L	12/29/2014 1752

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ64180-002
Batch: 64180
Analytical Method: 7470A
Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.0020	0.0019		1	94	85-115	12/29/2014 1753

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MS

Sample ID: PL18008-012MS
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.000017	0.0020	0.0019		1	93	85-115	12/29/2014 1808

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MSD

Sample ID: PL18008-012MD
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Mercury	0.000017	0.0020	0.0018		1	90	3.6	85-115	20	12/29/2014 1810

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MB

Sample ID: PQ64180-001
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Mercury	ND		1	0.00010	0.000015	mg/L	12/29/2014 1752

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - LCS

Sample ID: PQ64180-002
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Mercury	0.0020	0.0019		1	94	85-115	12/29/2014 1753

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MS

Sample ID: PL18008-012MS
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Mercury	ND	0.0020	0.0019		1	93	85-115	12/29/2014 1814

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

SHEALY ENVIRONMENTAL SERVICES, INC.

106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

Chain of Custody Record

Number 43229

Client: ARCADIS	Report to Contact: Scott Bartica	Telephone No. / E-mail: Scott.bartica@arcadis-us.com	Quote No.
Address: 801 Corporate Center Dr. #300	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Raleigh State: NC Zip Code: 27607	Printed Name: Jared Fire / Danny Mays		PL18008
Project Name: HAA-01			
Project No.: 10153001.0001.DE001	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Wastewater	No. of Containers by Preservative Type: Ungres	NaOH	HNO3	HCl	NaHSO4	None	VOC-8260	SVOC-8270	RCRA Metals	Hex. Chrome	GC Pesticides	Remarks / Cooler I.D.
HA01HMW02 (121614)	12/16/14	1045	G	X						3			X					
HA01HMW13 (121614)		1347	G	X			2			3			X	X				
DZ (121614)		—	G	X			2			3			X	X				
HA01MW14 (121614)		1537	G	X			4		2	3			X		X	X	X	Metals Total & Dissolved + Hex. Chrome
HA01HMW04 (121614)		1006	G	X						3			X					
HA01MW17 (121614)		1106	G	X						3			X					
HA01HMW11 (121614)		1406	G	X						3			X					
HA01HMW06 (121614)		1452	G	X			8			9			X	X				MS/MSD
HA01MW14D (121714)	12/17/14	1151	G	X						3			X					
DZ (121614)	12/16/14	—	G	X			4		2	3			X		X	X	X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☑ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	12/17/14	1800	1. Received by		
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: Fedex	Date	Time	4. Laboratory received by: Kelly	Date: 12-18-14	Time: 0930

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp: 3.4, 0.9c
2.1, 1.6, 1.5, 1.9

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com
Level 1 Report v2.1

SHEALY ENVIRONMENTAL SERVICES, INC.

SHEALY ENVIRONMENTAL SERVICES, INC.

106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

Chain of Custody Record

Number 43230

Client: ARCADIS	Report to Contact: Scott Bostian	Telephone No. / Email: Scott.bostian@arcadis-us.com	Quote No.
Address: 801 Corporate Center Dr. #300	Sampler's Signature: X / Danny Mays	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Raleigh State: NC Zip Code: 27607	Printed Name: Jared Fino / Danny Mays		PL18008
Project Name: HAA-01			

Project No.	P.O. No.	Date	Time	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Zn Ac/NaOH	VOC	SVOC	RCRA 8 Metals	Hex. Chrome	OC Pesticides	Remarks / Cooler I.D.
60153001.0001 - DE001																			
Sample ID / Description (Containers for each sample may be combined on one line.)																			
HA01MW14D (12/17/14)	12/17/14	1151	G	X							3			X					
HA01MW15 (12/17/14)		1015	G	X				3		3	9			X		X	X		MS/MSD
HA01HMW24 (12/17/14)		0942	G	X				2			3			X	X				
HA01HMW23 (12/17/14)		1046	G	X				2			3			X	X				
HA01HMW10 (12/17/14)		1156	G	X							3			X					
HA01SW03 (12/17/14)		1415	G	X				5		1	3			X	X	X	X	X	
HA01SW02 (12/17/14)		1445	G	X				5		1	3			X	X	X	X	X	
HA01SW01 (12/17/14)		1520	G	X				5		1	3			X	X	X	X	X	
DI (12/17/14)		—	G	X				5		1	3			X	X	X	X	X	
HA01SD03 (12/17/14)		1410	G		X			5						X	X	X	X	X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☑ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	12/17/14	1800	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	12-18-14	0930	4. Laboratory received by: Fedex Kelly	12-18-14	0930

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) (Yes) No Ice Pack
Receipt Temp: 3.4, 0.9°C
2.1, 1.6, 1.5, 1.9

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com
Level 1 Report v2.1

SHEALY ENVIRONMENTAL SERVICES, INC.

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

Chain of Custody Record

Number 43231

Client: ARCADIS	Report to Contact: Scott. Bastian	Telephone No. / E-mail: Scott.Bastian@arcadis-us.com	Quote No.
Address: 801 Corporate Center Dr. #300	Sampler's Signature: X / Danny Mays	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Raleigh State: NC Zip Code: 27607	Printed Name: Jered Fire / Danny Mays		PL18008
Project Name: HAA-01			

Project No.	P.O. No.	Date	Time	Grab / Composite	Matrix: Aqueous	Soil	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	VOC	SVOC	PCRA 8 Metals	Hex. Chrome	OC Pesticides	Remarks / Cooler I.D.
10153001.0001.DE015																			
Sample ID / Description (Containers for each sample may be combined on one line.)																			
HA015D02(121714)	12/17/14	1440	G		X		5							X	X	X	X	X	
HA015D01(121714)		1520	G		X		5							X	X	X	X	X	
D2(121714)		—	G		X		5							X	X	X	X	X	
TRIP BLANK		—	—		X					2				X					

JMP 12/17/14

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	12/17/14	1800	1. Received by		
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: Fedex	Date 12-18-14	Time 0930	4. Laboratory received by: Kelly	Date 12-18-14	Time 0930

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. 3.4, 0.9c
2.1, 1.6, 1.5, 1.9

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 06-01-2014

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Level 1 Report v2.1

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 16

Replaces Date: 07/15/14
Effective Date: 11/07/14

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: KMP / 12-18-14 Lot #: PL18008

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other			
Yes ☑	No ☐		1. Were custody seals present on the cooler?
Yes ☑	No ☐	NA ☐	2. If custody seals were present, were they intact and unbroken?
Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt: 2008/3.5/3.4 °C 090/1.0/0.9 °C 1495/2.2/2.1 °C 1952/1.7/1.6 °C 1395/1.6/1.5 °C 742/2.0/1.9 Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: #4 IR Gun Correction Factor: -0.1 °C Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.)
Yes ☑	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐		5. Were proper custody procedures (relinquished/received) followed?
Yes ☐	No ☑	NA ☐	5a Were samples relinquished by client to commercial courier?
Yes ☑	No ☐		6. Were sample IDs listed on the COC?
Yes ☑	No ☐		7. Were sample IDs listed on all sample containers?
Yes ☑	No ☐		8. Was collection date & time listed on the COC?
Yes ☑	No ☐		9. Was collection date & time listed on all sample containers?
Yes ☑	No ☐		10. Did all container label information (ID, date, time) agree with the COC?
Yes ☑	No ☐		11. Were tests to be performed listed on the COC?
Yes ☑	No ☐		12. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐		13. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐		14. Was adequate sample volume available?
Yes ☐	No ☑		15. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☑	No ☑	KMP 12-18-14	16. Were any samples containers missing?
Yes ☐	No ☑		17. Were there any excess samples not listed on COC?
Yes ☐	No ☑	NA ☐	18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	20. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	22. Were collection temperatures documented on the COC for NC samples?
Yes ☐	No ☐	NA ☑	23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
Yes ☐	No ☑		24. Was the quote number used taken from the container label?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) using SR # _____.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L (If #21 is No)

SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____

Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR#_____

Sample labels applied by: KMP Verified by: _____ Date: 12-18-14

Comments:
No vials recieved for PL18008-011

Report of Analysis

ARCADIS U.S., Inc.
30 Patewood Drive
Suite 155
Greenville, SC 29615
Attention: Rachelle Borne

Project Name: Hunter Stewart HAA-01

Project Number: GP08HAFS

Lot Number: PL19009

Date Completed: 01/12/2015



Nisreen Saikaly
Project Manager

This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

PL19009

Case Narrative
ARCADIS U.S., Inc.
Lot Number: PL19009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Hexavalent Chromium

Samples were received outside the holding time for Hexavalent Chromium analysis.

The MS/MSD recoveries in batch 63847 were outside acceptance criteria. All other QA/QC criteria for the batch were within acceptance criteria and method control limits. The MS/MSD recovery results are attributed to matrix interference. The associated sample results were reported and no corrective action was required.

Pesticides

The LCS recovery for endrin was outside method control limits in batch 64159. The associated sample (-001, -002 and -003) were re-extracted and re-analyzed outside the holding time. All runs are reported.

Semivolatile Organic Compounds

The surrogate recovery for samples -002 and -005 was outside the acceptance limit. This sample was diluted due to matrix. The dilution impacted the surrogate recoveries, thus negating their usefulness concerning quality control. The sample results are reported and no corrective action is required

Sample Summary
ARCADIS U.S., Inc.
Lot Number: PL19009

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	HAO1SW06(121814)	Aqueous	12/18/2014 0831	12/19/2014
002	HAO1SW05(121814)	Aqueous	12/18/2014 0905	12/19/2014
003	HAO1SW04(121814)	Aqueous	12/18/2014 0945	12/19/2014
004	HAO1SD06(121814)	Solid	12/18/2014 0840	12/19/2014
005	HAO1SD05(121814)	Solid	12/18/2014 0900	12/19/2014
006	HAO1SD04(121814)	Solid	12/18/2014 0930	12/19/2014
007	TRIP BLANK	Aqueous	12/18/2014	12/19/2014

(7 samples)

Executive Summary
ARCADIS U.S., Inc.
Lot Number: PL19009

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	HAO1SW06(121814)	Aqueous	Methoxychlor	8081B	0.070	J	ug/L	12
001	HAO1SW06(121814)	Aqueous	Endrin aldehyde	8081B	0.0042	HJP	ug/L	13
001	HAO1SW06(121814)	Aqueous	Methoxychlor	8081B	0.0060	HJ	ug/L	13
001	HAO1SW06(121814)	Aqueous	Arsenic	6020A	0.77	J	ug/L	14
001	HAO1SW06(121814)	Aqueous	Barium	6020A	24		ug/L	14
001	HAO1SW06(121814)	Aqueous	Chromium	6020A	0.54	J	ug/L	14
001	HAO1SW06(121814)	Aqueous	Lead	6020A	1.5		ug/L	14
001	HAO1SW06(121814)	Aqueous	Selenium	6020A	0.25	J	ug/L	14
002	HAO1SW05(121814)	Aqueous	Endrin aldehyde	8081B	0.0028	HJP	ug/L	22
002	HAO1SW05(121814)	Aqueous	Arsenic	6020A	0.95	J	ug/L	23
002	HAO1SW05(121814)	Aqueous	Barium	6020A	26		ug/L	23
002	HAO1SW05(121814)	Aqueous	Chromium	6020A	0.85	J	ug/L	23
002	HAO1SW05(121814)	Aqueous	Lead	6020A	1.5		ug/L	23
002	HAO1SW05(121814)	Aqueous	Selenium	6020A	0.31	J	ug/L	23
003	HAO1SW04(121814)	Aqueous	Xylenes (total)	8260B	0.36	J	ug/L	26
003	HAO1SW04(121814)	Aqueous	gamma-BHC (Lindane)	8081B	0.0015	J	ug/L	30
003	HAO1SW04(121814)	Aqueous	Methoxychlor	8081B	0.0025	JP	ug/L	30
003	HAO1SW04(121814)	Aqueous	delta-BHC	8081B	0.0023	HJP	ug/L	31
003	HAO1SW04(121814)	Aqueous	Endrin aldehyde	8081B	0.0043	HJP	ug/L	31
003	HAO1SW04(121814)	Aqueous	Arsenic	6020A	0.70	J	ug/L	32
003	HAO1SW04(121814)	Aqueous	Barium	6020A	26		ug/L	32
003	HAO1SW04(121814)	Aqueous	Chromium	6020A	0.49	J	ug/L	32
003	HAO1SW04(121814)	Aqueous	Lead	6020A	0.86	J	ug/L	32
004	HAO1SD06(121814)	Solid	Acetone	8260B	42		ug/kg	35
004	HAO1SD06(121814)	Solid	Acenaphthylene	8270D	700		ug/kg	37
004	HAO1SD06(121814)	Solid	Anthracene	8270D	760		ug/kg	37
004	HAO1SD06(121814)	Solid	Benzo(a)anthracene	8270D	4800		ug/kg	37
004	HAO1SD06(121814)	Solid	Benzo(a)pyrene	8270D	5600		ug/kg	37
004	HAO1SD06(121814)	Solid	Benzo(b)fluoranthene	8270D	9600		ug/kg	37
004	HAO1SD06(121814)	Solid	Benzo(g,h,i)perylene	8270D	1600		ug/kg	37
004	HAO1SD06(121814)	Solid	Benzo(k)fluoranthene	8270D	4000		ug/kg	37
004	HAO1SD06(121814)	Solid	Carbazole	8270D	300	J	ug/kg	37
004	HAO1SD06(121814)	Solid	Chrysene	8270D	4900		ug/kg	37
004	HAO1SD06(121814)	Solid	Dibenzofuran	8270D	450	J	ug/kg	37
004	HAO1SD06(121814)	Solid	Fluoranthene	8270D	8200		ug/kg	37
004	HAO1SD06(121814)	Solid	Fluorene	8270D	1000		ug/kg	37
004	HAO1SD06(121814)	Solid	Indeno(1,2,3-c,d)pyrene	8270D	1900		ug/kg	38
004	HAO1SD06(121814)	Solid	Phenanthrene	8270D	1100		ug/kg	38
004	HAO1SD06(121814)	Solid	Pyrene	8270D	5700		ug/kg	38
004	HAO1SD06(121814)	Solid	delta-BHC	8081B	2.4	JP	ug/kg	39
004	HAO1SD06(121814)	Solid	4,4'-DDD	8081B	3.6	JP	ug/kg	39
004	HAO1SD06(121814)	Solid	4,4'-DDT	8081B	6.2	JP	ug/kg	39
004	HAO1SD06(121814)	Solid	Endrin	8081B	6.8	JP	ug/kg	39
004	HAO1SD06(121814)	Solid	Endrin aldehyde	8081B	6.0	JP	ug/kg	39
004	HAO1SD06(121814)	Solid	Endrin ketone	8081B	15	JP	ug/kg	39

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
004	HAO1SD06(121814)	Solid	Methoxychlor	8081B	11	JP	ug/kg	39
004	HAO1SD06(121814)	Solid	Arsenic	6010C	2.9		mg/kg	40
004	HAO1SD06(121814)	Solid	Barium	6010C	18		mg/kg	40
004	HAO1SD06(121814)	Solid	Cadmium	6010C	0.26		mg/kg	40
004	HAO1SD06(121814)	Solid	Chromium	6010C	6.0		mg/kg	40
004	HAO1SD06(121814)	Solid	Lead	6010C	16		mg/kg	40
004	HAO1SD06(121814)	Solid	Mercury	7471B	0.019	J	mg/kg	40
004	HAO1SD06(121814)	Solid	Selenium	6010C	0.54	J	mg/kg	40
005	HAO1SD05(121814)	Solid	Acenaphthene	8270D	1200	J	ug/kg	44
005	HAO1SD05(121814)	Solid	Acenaphthylene	8270D	4400		ug/kg	44
005	HAO1SD05(121814)	Solid	Anthracene	8270D	9700		ug/kg	44
005	HAO1SD05(121814)	Solid	Benzo(a)anthracene	8270D	39000		ug/kg	44
005	HAO1SD05(121814)	Solid	Benzo(a)pyrene	8270D	35000		ug/kg	44
005	HAO1SD05(121814)	Solid	Benzo(b)fluoranthene	8270D	51000		ug/kg	44
005	HAO1SD05(121814)	Solid	Benzo(g,h,i)perylene	8270D	8700		ug/kg	44
005	HAO1SD05(121814)	Solid	Benzo(k)fluoranthene	8270D	23000		ug/kg	44
005	HAO1SD05(121814)	Solid	Carbazole	8270D	3800		ug/kg	44
005	HAO1SD05(121814)	Solid	Chrysene	8270D	39000		ug/kg	44
005	HAO1SD05(121814)	Solid	Dibenzofuran	8270D	2000	J	ug/kg	44
005	HAO1SD05(121814)	Solid	Fluoranthene	8270D	94000		ug/kg	44
005	HAO1SD05(121814)	Solid	Fluorene	8270D	4400		ug/kg	44
005	HAO1SD05(121814)	Solid	Indeno(1,2,3-c,d)pyrene	8270D	9600		ug/kg	45
005	HAO1SD05(121814)	Solid	Phenanthrene	8270D	36000		ug/kg	45
005	HAO1SD05(121814)	Solid	Pyrene	8270D	63000		ug/kg	45
005	HAO1SD05(121814)	Solid	alpha-Chlordane	8081B	5.5	J	ug/kg	46
005	HAO1SD05(121814)	Solid	gamma-Chlordane	8081B	3.6	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	4,4'-DDD	8081B	38	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	4,4'-DDT	8081B	13	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	Dieldrin	8081B	5.1	J	ug/kg	46
005	HAO1SD05(121814)	Solid	Endosulfan II	8081B	3.9	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	Endosulfan sulfate	8081B	5.2	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	Endrin	8081B	5.9	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	Endrin aldehyde	8081B	17	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	Endrin ketone	8081B	80		ug/kg	46
005	HAO1SD05(121814)	Solid	Methoxychlor	8081B	110	JP	ug/kg	46
005	HAO1SD05(121814)	Solid	Arsenic	6010C	1.0		mg/kg	47
005	HAO1SD05(121814)	Solid	Barium	6010C	16		mg/kg	47
005	HAO1SD05(121814)	Solid	Cadmium	6010C	0.33		mg/kg	47
005	HAO1SD05(121814)	Solid	Chromium	6010C	9.1		mg/kg	47
005	HAO1SD05(121814)	Solid	Lead	6010C	18		mg/kg	47
006	HAO1SD04(121814)	Solid	Isopropylbenzene	8260B	0.87	J	ug/kg	49
006	HAO1SD04(121814)	Solid	Aldrin	8081B	1.5	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	alpha-Chlordane	8081B	1.3	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	gamma-Chlordane	8081B	1.4	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	4,4'-DDD	8081B	11	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	4,4'-DDT	8081B	12	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Dieldrin	8081B	4.1	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Endosulfan I	8081B	1.6	JP	ug/kg	53

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
006	HAO1SD04(121814)	Solid	Endosulfan II	8081B	2.8	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Endosulfan sulfate	8081B	29	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Endrin	8081B	14	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Endrin aldehyde	8081B	21	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Endrin ketone	8081B	45	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Methoxychlor	8081B	80	JP	ug/kg	53
006	HAO1SD04(121814)	Solid	Arsenic	6010C	0.65	J	mg/kg	54
006	HAO1SD04(121814)	Solid	Barium	6010C	15		mg/kg	54
006	HAO1SD04(121814)	Solid	Cadmium	6010C	0.23		mg/kg	54
006	HAO1SD04(121814)	Solid	Chromium	6010C	3.8		mg/kg	54
006	HAO1SD04(121814)	Solid	Lead	6010C	10		mg/kg	54
006	HAO1SD04(121814)	Solid	Selenium	6010C	0.26	J	mg/kg	54
007	TRIP BLANK	Aqueous	Carbon disulfide	8260B	0.59	J	ug/L	55
007	TRIP BLANK	Aqueous	Toluene	8260B	0.36	J	ug/L	55

(107 detections)

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/19/2014 1315	BLB		63536

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/29/2014 1308	DCS		64151

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		101	70-130
Bromofluorobenzene		107	70-130
Toluene-d8		99	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	12/31/2014 1846	DRB1	12/24/2014 0938	63919

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acenaphthene	83-32-9	8270D	ND		1.0	0.090	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		1.0	0.16	ug/L	1
Anthracene	120-12-7	8270D	ND		1.0	0.13	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		1.0	0.15	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		1.0	0.16	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		1.0	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		1.0	0.23	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		1.0	0.12	ug/L	1
4-Bromophenyl phenyl ether	101-55-3	8270D	ND		1.0	0.12	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		5.0	1.7	ug/L	1
Carbazole	86-74-8	8270D	ND		1.0	0.25	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		1.0	0.22	ug/L	1
4-Chloroaniline	106-47-8	8270D	ND		1.0	0.13	ug/L	1
bis(2-Chloroethoxy)methane	111-91-1	8270D	ND		1.0	0.13	ug/L	1
bis(2-Chloroisopropyl)ether	108-60-1	8270D	ND		1.0	0.080	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		1.0	0.12	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		1.0	0.13	ug/L	1
4-Chlorophenyl phenyl ether	7005-72-3	8270D	ND		1.0	0.11	ug/L	1
Chrysene	218-01-9	8270D	ND		1.0	0.12	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		1.0	0.13	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		1.0	0.16	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		5.0	0.81	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.0	0.15	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		5.0	1.7	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		5.0	1.7	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		1.0	0.31	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		5.0	1.7	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		5.0	1.5	ug/L	1
2,4-Dinitrophenol	51-28-5	8270D	ND		5.0	0.25	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		2.0	0.45	ug/L	1
2,6-Dinitrotoluene	606-20-2	8270D	ND		2.0	0.40	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		5.0	1.7	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		5.0	1.7	ug/L	1
Fluoranthene	206-44-0	8270D	ND		1.0	0.21	ug/L	1
Fluorene	86-73-7	8270D	ND		1.0	0.10	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		1.0	0.21	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		1.0	0.090	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		5.0	0.23	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		1.0	0.11	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		1.0	0.23	ug/L	1
Isophorone	78-59-1	8270D	ND		1.0	0.080	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		1.0	0.080	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		1.0	0.17	ug/L	1
3 & 4-Methylphenol	106-44-5	8270D	ND		2.0	0.57	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	12/31/2014 1846	DRB1	12/24/2014 0938	63919

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Naphthalene	91-20-3	8270D	ND		1.0	0.070	ug/L	1
2-Nitroaniline	88-74-4	8270D	ND		2.0	0.55	ug/L	1
3-Nitroaniline	99-09-2	8270D	ND		2.0	0.77	ug/L	1
4-Nitroaniline	100-01-6	8270D	ND		2.0	0.39	ug/L	1
Nitrobenzene	98-95-3	8270D	ND		1.0	0.10	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		2.0	0.27	ug/L	1
4-Nitrophenol	100-02-7	8270D	ND		5.0	0.64	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		1.0	0.080	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		1.0	0.38	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		5.0	0.54	ug/L	1
Phenanthrene	85-01-8	8270D	ND		1.0	0.18	ug/L	1
Phenol	108-95-2	8270D	ND		1.0	0.11	ug/L	1
Pyrene	129-00-0	8270D	ND		1.0	0.16	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		1.0	0.18	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		1.0	0.22	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		54	37-129
2-Fluorophenol		51	24-127
Nitrobenzene-d5		47	38-127
Phenol-d5		50	28-128
Terphenyl-d14		51	10-148
2,4,6-Tribromophenol		48	41-144

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	10	12/29/2014 1300	MEM	12/24/2014 1857	63984
2	3520C	8081B	1	01/06/2015 1345	MEM	12/30/2014 1824	64252

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND		0.25	0.017	ug/L	1
gamma-BHC (Lindane)	58-89-9	8081B	ND		0.25	0.011	ug/L	1
alpha-BHC	319-84-6	8081B	ND		0.25	0.010	ug/L	1
beta-BHC	319-85-7	8081B	ND		0.25	0.039	ug/L	1
delta-BHC	319-86-8	8081B	ND		0.25	0.011	ug/L	1
alpha-Chlordane	5103-71-9	8081B	ND		0.25	0.013	ug/L	1
gamma-Chlordane	5103-74-2	8081B	ND		0.25	0.015	ug/L	1
4,4'-DDD	72-54-8	8081B	ND		0.25	0.010	ug/L	1
4,4'-DDE	72-55-9	8081B	ND		0.25	0.11	ug/L	1
4,4'-DDT	50-29-3	8081B	ND		0.25	0.020	ug/L	1
Dieldrin	60-57-1	8081B	ND		0.25	0.010	ug/L	1
Endosulfan I	959-98-8	8081B	ND		0.25	0.022	ug/L	1
Endosulfan II	33213-65-9	8081B	ND		0.25	0.015	ug/L	1
Endosulfan sulfate	1031-07-8	8081B	ND		0.25	0.011	ug/L	1
Endrin	72-20-8	8081B	ND		0.25	0.010	ug/L	1
Endrin aldehyde	7421-93-4	8081B	ND		0.25	0.019	ug/L	1
Endrin ketone	53494-70-5	8081B	ND		0.25	0.012	ug/L	1
Heptachlor	76-44-8	8081B	ND		0.25	0.13	ug/L	1
Heptachlor epoxide	1024-57-3	8081B	ND		0.25	0.020	ug/L	1
Methoxychlor	72-43-5	8081B	0.070	J	1.0	0.020	ug/L	1
Toxaphene	8001-35-2	8081B	ND		2.5	1.1	ug/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
Decachlorobiphenyl		61	10-122	H	60	10-122
Tetrachloro-m-xylene		85	46-119	H	67	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	10	12/29/2014 1300	MEM	12/24/2014 1857	63984
2	3520C	8081B	1	01/06/2015 1345	MEM	12/30/2014 1824	64252

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND	H	0.025	0.0017	ug/L	2
gamma-BHC (Lindane)	58-89-9	8081B	ND	H	0.025	0.0011	ug/L	2
alpha-BHC	319-84-6	8081B	ND	H	0.025	0.0010	ug/L	2
beta-BHC	319-85-7	8081B	ND	H	0.025	0.0039	ug/L	2
delta-BHC	319-86-8	8081B	ND	H	0.025	0.0011	ug/L	2
alpha-Chlordane	5103-71-9	8081B	ND	H	0.025	0.0013	ug/L	2
gamma-Chlordane	5103-74-2	8081B	ND	H	0.025	0.0015	ug/L	2
4,4'-DDD	72-54-8	8081B	ND	H	0.025	0.0010	ug/L	2
4,4'-DDE	72-55-9	8081B	ND	H	0.025	0.011	ug/L	2
4,4'-DDT	50-29-3	8081B	ND	H	0.025	0.0020	ug/L	2
Dieldrin	60-57-1	8081B	ND	H	0.025	0.0010	ug/L	2
Endosulfan I	959-98-8	8081B	ND	H	0.025	0.0022	ug/L	2
Endosulfan II	33213-65-9	8081B	ND	H	0.025	0.0015	ug/L	2
Endosulfan sulfate	1031-07-8	8081B	ND	H	0.025	0.0011	ug/L	2
Endrin	72-20-8	8081B	ND	H	0.025	0.0010	ug/L	2
Endrin aldehyde	7421-93-4	8081B	0.0042	HJP	0.025	0.0019	ug/L	2
Endrin ketone	53494-70-5	8081B	ND	H	0.025	0.0012	ug/L	2
Heptachlor	76-44-8	8081B	ND	H	0.025	0.013	ug/L	2
Heptachlor epoxide	1024-57-3	8081B	ND	H	0.025	0.0020	ug/L	2
Methoxychlor	72-43-5	8081B	0.0060	HJ	0.10	0.0020	ug/L	2
Toxaphene	8001-35-2	8081B	ND	H	0.25	0.11	ug/L	2

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
Decachlorobiphenyl		61	10-122	H	60	10-122
Tetrachloro-m-xylene		85	46-119	H	67	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	01/09/2015 0234	BNW	01/08/2015 1415	64841
2	3005A	6020A	1	01/09/2015 1810	CDF	01/08/2015 1415	64841

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6020A	0.77	J	1.0	0.26	ug/L	1
Barium	7440-39-3	6020A	24		5.0	0.045	ug/L	1
Cadmium	7440-43-9	6020A	ND		0.10	0.059	ug/L	1
Chromium	7440-47-3	6020A	0.54	J	5.0	0.35	ug/L	1
Lead	7439-92-1	6020A	1.5		1.0	0.047	ug/L	1
Selenium	7782-49-2	6020A	0.25	J	1.0	0.25	ug/L	1
Silver	7440-22-4	6020A	ND		1.0	0.011	ug/L	2

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

CVAA

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-001
Description: HAO1SW06(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0831
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/29/2014 1834	HKB	12/29/2014 1445	64180

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/19/2014 1315	BLB		63536

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/29/2014 1329	DCS		64151

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		107	70-130
Bromofluorobenzene		115	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	50	01/02/2015 1815	DRB1	12/24/2014 0938	63919

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acenaphthene	83-32-9	8270D	ND		50	4.5	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		50	8.0	ug/L	1
Anthracene	120-12-7	8270D	ND		50	6.5	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		50	7.5	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		50	8.0	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		50	10	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		50	12	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		50	6.0	ug/L	1
4-Bromophenyl phenyl ether	101-55-3	8270D	ND		50	6.0	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		250	85	ug/L	1
Carbazole	86-74-8	8270D	ND		50	13	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		50	11	ug/L	1
4-Chloroaniline	106-47-8	8270D	ND		50	6.5	ug/L	1
bis(2-Chloroethoxy)methane	111-91-1	8270D	ND		50	6.5	ug/L	1
bis(2-Chloroisopropyl)ether	108-60-1	8270D	ND		50	4.0	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		50	6.0	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		50	6.5	ug/L	1
4-Chlorophenyl phenyl ether	7005-72-3	8270D	ND		50	5.5	ug/L	1
Chrysene	218-01-9	8270D	ND		50	6.0	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		50	6.5	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		50	8.0	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		250	41	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		50	7.5	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		250	85	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		250	85	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		50	16	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		250	85	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		250	74	ug/L	1
2,4-Dinitrophenol	51-28-5	8270D	ND		250	13	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		100	23	ug/L	1
2,6-Dinitrotoluene	606-20-2	8270D	ND		100	20	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		250	85	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		250	85	ug/L	1
Fluoranthene	206-44-0	8270D	ND		50	11	ug/L	1
Fluorene	86-73-7	8270D	ND		50	5.0	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		50	11	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		50	4.5	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		250	12	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		50	5.5	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		50	12	ug/L	1
Isophorone	78-59-1	8270D	ND		50	4.0	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		50	4.0	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		50	8.5	ug/L	1
3 & 4-Methylphenol	106-44-5	8270D	ND		100	29	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	50	01/02/2015 1815	DRB1	12/24/2014 0938	63919

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Naphthalene	91-20-3	8270D	ND		50	3.5	ug/L	1
2-Nitroaniline	88-74-4	8270D	ND		100	28	ug/L	1
3-Nitroaniline	99-09-2	8270D	ND		100	39	ug/L	1
4-Nitroaniline	100-01-6	8270D	ND		100	20	ug/L	1
Nitrobenzene	98-95-3	8270D	ND		50	5.0	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		100	14	ug/L	1
4-Nitrophenol	100-02-7	8270D	ND		250	32	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		50	4.0	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		50	19	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		250	27	ug/L	1
Phenanthrene	85-01-8	8270D	ND		50	9.0	ug/L	1
Phenol	108-95-2	8270D	ND		50	5.5	ug/L	1
Pyrene	129-00-0	8270D	ND		50	8.0	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		50	9.0	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		50	11	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		65	37-129
2-Fluorophenol		59	24-127
Nitrobenzene-d5		67	38-127
Phenol-d5	N	157	28-128
Terphenyl-d14		49	10-148
2,4,6-Tribromophenol	N	209	41-144

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	10	12/29/2014 1315	MEM	12/24/2014 1857	63984
2	3520C	8081B	1	01/06/2015 1428	MEM	12/30/2014 1824	64252

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND		0.25	0.017	ug/L	1
gamma-BHC (Lindane)	58-89-9	8081B	ND		0.25	0.011	ug/L	1
alpha-BHC	319-84-6	8081B	ND		0.25	0.010	ug/L	1
beta-BHC	319-85-7	8081B	ND		0.25	0.039	ug/L	1
delta-BHC	319-86-8	8081B	ND		0.25	0.011	ug/L	1
alpha-Chlordane	5103-71-9	8081B	ND		0.25	0.013	ug/L	1
gamma-Chlordane	5103-74-2	8081B	ND		0.25	0.015	ug/L	1
4,4'-DDD	72-54-8	8081B	ND		0.25	0.010	ug/L	1
4,4'-DDE	72-55-9	8081B	ND		0.25	0.11	ug/L	1
4,4'-DDT	50-29-3	8081B	ND		0.25	0.020	ug/L	1
Dieldrin	60-57-1	8081B	ND		0.25	0.010	ug/L	1
Endosulfan I	959-98-8	8081B	ND		0.25	0.022	ug/L	1
Endosulfan II	33213-65-9	8081B	ND		0.25	0.015	ug/L	1
Endosulfan sulfate	1031-07-8	8081B	ND		0.25	0.011	ug/L	1
Endrin	72-20-8	8081B	ND		0.25	0.010	ug/L	1
Endrin aldehyde	7421-93-4	8081B	ND		0.25	0.019	ug/L	1
Endrin ketone	53494-70-5	8081B	ND		0.25	0.012	ug/L	1
Heptachlor	76-44-8	8081B	ND		0.25	0.13	ug/L	1
Heptachlor epoxide	1024-57-3	8081B	ND		0.25	0.020	ug/L	1
Methoxychlor	72-43-5	8081B	ND		1.0	0.020	ug/L	1
Toxaphene	8001-35-2	8081B	ND		2.5	1.1	ug/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
Decachlorobiphenyl		73	10-122	H	61	10-122
Tetrachloro-m-xylene		83	46-119	H	65	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	10	12/29/2014 1315	MEM	12/24/2014 1857	63984
2	3520C	8081B	1	01/06/2015 1428	MEM	12/30/2014 1824	64252

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND	H	0.025	0.0017	ug/L	2
gamma-BHC (Lindane)	58-89-9	8081B	ND	H	0.025	0.0011	ug/L	2
alpha-BHC	319-84-6	8081B	ND	H	0.025	0.0010	ug/L	2
beta-BHC	319-85-7	8081B	ND	H	0.025	0.0039	ug/L	2
delta-BHC	319-86-8	8081B	ND	H	0.025	0.0011	ug/L	2
alpha-Chlordane	5103-71-9	8081B	ND	H	0.025	0.0013	ug/L	2
gamma-Chlordane	5103-74-2	8081B	ND	H	0.025	0.0015	ug/L	2
4,4'-DDD	72-54-8	8081B	ND	H	0.025	0.0010	ug/L	2
4,4'-DDE	72-55-9	8081B	ND	H	0.025	0.011	ug/L	2
4,4'-DDT	50-29-3	8081B	ND	H	0.025	0.0020	ug/L	2
Dieldrin	60-57-1	8081B	ND	H	0.025	0.0010	ug/L	2
Endosulfan I	959-98-8	8081B	ND	H	0.025	0.0022	ug/L	2
Endosulfan II	33213-65-9	8081B	ND	H	0.025	0.0015	ug/L	2
Endosulfan sulfate	1031-07-8	8081B	ND	H	0.025	0.0011	ug/L	2
Endrin	72-20-8	8081B	ND	H	0.025	0.0010	ug/L	2
Endrin aldehyde	7421-93-4	8081B	0.0028	HJP	0.025	0.0019	ug/L	2
Endrin ketone	53494-70-5	8081B	ND	H	0.025	0.0012	ug/L	2
Heptachlor	76-44-8	8081B	ND	H	0.025	0.013	ug/L	2
Heptachlor epoxide	1024-57-3	8081B	ND	H	0.025	0.0020	ug/L	2
Methoxychlor	72-43-5	8081B	ND	H	0.10	0.0020	ug/L	2
Toxaphene	8001-35-2	8081B	ND	H	0.25	0.11	ug/L	2

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
Decachlorobiphenyl		73	10-122	H	61	10-122
Tetrachloro-m-xylene		83	46-119	H	65	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	01/09/2015 0240	BNW	01/08/2015 1415	64841
2	3005A	6020A	1	01/09/2015 1816	CDF	01/08/2015 1415	64841

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6020A	0.95	J	1.0	0.26	ug/L	1
Barium	7440-39-3	6020A	26		5.0	0.045	ug/L	1
Cadmium	7440-43-9	6020A	ND		0.10	0.059	ug/L	1
Chromium	7440-47-3	6020A	0.85	J	5.0	0.35	ug/L	1
Lead	7439-92-1	6020A	1.5		1.0	0.047	ug/L	1
Selenium	7782-49-2	6020A	0.31	J	1.0	0.25	ug/L	1
Silver	7440-22-4	6020A	ND		1.0	0.011	ug/L	2

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

CVAA

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-002
Description: HAO1SW05(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0905
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/29/2014 1836	HKB	12/29/2014 1445	64180

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/19/2014 1315	BLB		63536

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/29/2014 1351	DCS		64151

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	0.36	J	1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		114	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	12/31/2014 1909	DRB1	12/24/2014 0938	63919

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acenaphthene	83-32-9	8270D	ND		1.0	0.090	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		1.0	0.16	ug/L	1
Anthracene	120-12-7	8270D	ND		1.0	0.13	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		1.0	0.15	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		1.0	0.16	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		1.0	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		1.0	0.23	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		1.0	0.12	ug/L	1
4-Bromophenyl phenyl ether	101-55-3	8270D	ND		1.0	0.12	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		5.0	1.7	ug/L	1
Carbazole	86-74-8	8270D	ND		1.0	0.25	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		1.0	0.22	ug/L	1
4-Chloroaniline	106-47-8	8270D	ND		1.0	0.13	ug/L	1
bis(2-Chloroethoxy)methane	111-91-1	8270D	ND		1.0	0.13	ug/L	1
bis(2-Chloroisopropyl)ether	108-60-1	8270D	ND		1.0	0.080	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		1.0	0.12	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		1.0	0.13	ug/L	1
4-Chlorophenyl phenyl ether	7005-72-3	8270D	ND		1.0	0.11	ug/L	1
Chrysene	218-01-9	8270D	ND		1.0	0.12	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		1.0	0.13	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		1.0	0.16	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		5.0	0.81	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.0	0.15	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		5.0	1.7	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		5.0	1.7	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		1.0	0.31	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		5.0	1.7	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		5.0	1.5	ug/L	1
2,4-Dinitrophenol	51-28-5	8270D	ND		5.0	0.25	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		2.0	0.45	ug/L	1
2,6-Dinitrotoluene	606-20-2	8270D	ND		2.0	0.40	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		5.0	1.7	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		5.0	1.7	ug/L	1
Fluoranthene	206-44-0	8270D	ND		1.0	0.21	ug/L	1
Fluorene	86-73-7	8270D	ND		1.0	0.10	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		1.0	0.21	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		1.0	0.090	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		5.0	0.23	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		1.0	0.11	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		1.0	0.23	ug/L	1
Isophorone	78-59-1	8270D	ND		1.0	0.080	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		1.0	0.080	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		1.0	0.17	ug/L	1
3 & 4-Methylphenol	106-44-5	8270D	ND		2.0	0.57	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	12/31/2014 1909	DRB1	12/24/2014 0938	63919

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Naphthalene	91-20-3	8270D	ND		1.0	0.070	ug/L	1
2-Nitroaniline	88-74-4	8270D	ND		2.0	0.55	ug/L	1
3-Nitroaniline	99-09-2	8270D	ND		2.0	0.77	ug/L	1
4-Nitroaniline	100-01-6	8270D	ND		2.0	0.39	ug/L	1
Nitrobenzene	98-95-3	8270D	ND		1.0	0.10	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		2.0	0.27	ug/L	1
4-Nitrophenol	100-02-7	8270D	ND		5.0	0.64	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		1.0	0.080	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		1.0	0.38	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		5.0	0.54	ug/L	1
Phenanthrene	85-01-8	8270D	ND		1.0	0.18	ug/L	1
Phenol	108-95-2	8270D	ND		1.0	0.11	ug/L	1
Pyrene	129-00-0	8270D	ND		1.0	0.16	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		1.0	0.18	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		1.0	0.22	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		60	37-129
2-Fluorophenol		57	24-127
Nitrobenzene-d5		53	38-127
Phenol-d5		55	28-128
Terphenyl-d14		51	10-148
2,4,6-Tribromophenol		55	41-144

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	1	12/29/2014 1329	MEM	12/24/2014 1857	63984
2	3520C	8081B	1	01/05/2015 2324	MEM	12/30/2014 1824	64252

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND		0.025	0.0017	ug/L	1
gamma-BHC (Lindane)	58-89-9	8081B	0.0015	J	0.025	0.0011	ug/L	1
alpha-BHC	319-84-6	8081B	ND		0.025	0.0010	ug/L	1
beta-BHC	319-85-7	8081B	ND		0.025	0.0039	ug/L	1
delta-BHC	319-86-8	8081B	ND		0.025	0.0011	ug/L	1
alpha-Chlordane	5103-71-9	8081B	ND		0.025	0.0013	ug/L	1
gamma-Chlordane	5103-74-2	8081B	ND		0.025	0.0015	ug/L	1
4,4'-DDD	72-54-8	8081B	ND		0.025	0.0010	ug/L	1
4,4'-DDE	72-55-9	8081B	ND		0.025	0.011	ug/L	1
4,4'-DDT	50-29-3	8081B	ND		0.025	0.0020	ug/L	1
Dieldrin	60-57-1	8081B	ND		0.025	0.0010	ug/L	1
Endosulfan I	959-98-8	8081B	ND		0.025	0.0022	ug/L	1
Endosulfan II	33213-65-9	8081B	ND		0.025	0.0015	ug/L	1
Endosulfan sulfate	1031-07-8	8081B	ND		0.025	0.0011	ug/L	1
Endrin	72-20-8	8081B	ND		0.025	0.0010	ug/L	1
Endrin aldehyde	7421-93-4	8081B	ND		0.025	0.0019	ug/L	1
Endrin ketone	53494-70-5	8081B	ND		0.025	0.0012	ug/L	1
Heptachlor	76-44-8	8081B	ND		0.025	0.013	ug/L	1
Heptachlor epoxide	1024-57-3	8081B	ND		0.025	0.0020	ug/L	1
Methoxychlor	72-43-5	8081B	0.0025	JP	0.10	0.0020	ug/L	1
Toxaphene	8001-35-2	8081B	ND		0.25	0.11	ug/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
Decachlorobiphenyl		59	10-122	H	54	10-122
Tetrachloro-m-xylene		79	46-119	H	60	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	1	12/29/2014 1329	MEM	12/24/2014 1857	63984
2	3520C	8081B	1	01/05/2015 2324	MEM	12/30/2014 1824	64252

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND	H	0.025	0.0017	ug/L	2
gamma-BHC (Lindane)	58-89-9	8081B	ND	H	0.025	0.0011	ug/L	2
alpha-BHC	319-84-6	8081B	ND	H	0.025	0.0010	ug/L	2
beta-BHC	319-85-7	8081B	ND	H	0.025	0.0039	ug/L	2
delta-BHC	319-86-8	8081B	0.0023	HJP	0.025	0.0011	ug/L	2
alpha-Chlordane	5103-71-9	8081B	ND	H	0.025	0.0013	ug/L	2
gamma-Chlordane	5103-74-2	8081B	ND	H	0.025	0.0015	ug/L	2
4,4'-DDD	72-54-8	8081B	ND	H	0.025	0.0010	ug/L	2
4,4'-DDE	72-55-9	8081B	ND	H	0.025	0.011	ug/L	2
4,4'-DDT	50-29-3	8081B	ND	H	0.025	0.0020	ug/L	2
Dieldrin	60-57-1	8081B	ND	H	0.025	0.0010	ug/L	2
Endosulfan I	959-98-8	8081B	ND	H	0.025	0.0022	ug/L	2
Endosulfan II	33213-65-9	8081B	ND	H	0.025	0.0015	ug/L	2
Endosulfan sulfate	1031-07-8	8081B	ND	H	0.025	0.0011	ug/L	2
Endrin	72-20-8	8081B	ND	H	0.025	0.0010	ug/L	2
Endrin aldehyde	7421-93-4	8081B	0.0043	HJP	0.025	0.0019	ug/L	2
Endrin ketone	53494-70-5	8081B	ND	H	0.025	0.0012	ug/L	2
Heptachlor	76-44-8	8081B	ND	H	0.025	0.013	ug/L	2
Heptachlor epoxide	1024-57-3	8081B	ND	H	0.025	0.0020	ug/L	2
Methoxychlor	72-43-5	8081B	ND	H	0.10	0.0020	ug/L	2
Toxaphene	8001-35-2	8081B	ND	H	0.25	0.11	ug/L	2

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
Decachlorobiphenyl		59	10-122	H	54	10-122
Tetrachloro-m-xylene		79	46-119	H	60	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	01/09/2015 0245	BNW	01/08/2015 1415	64841
2	3005A	6020A	1	01/09/2015 1821	CDF	01/08/2015 1415	64841

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6020A	0.70	J	1.0	0.26	ug/L	1
Barium	7440-39-3	6020A	26		5.0	0.045	ug/L	1
Cadmium	7440-43-9	6020A	ND		0.10	0.059	ug/L	1
Chromium	7440-47-3	6020A	0.49	J	5.0	0.35	ug/L	1
Lead	7439-92-1	6020A	0.86	J	1.0	0.047	ug/L	1
Selenium	7782-49-2	6020A	ND		1.0	0.25	ug/L	1
Silver	7440-22-4	6020A	ND		1.0	0.011	ug/L	2

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

CVAA

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-003
Description: HAO1SW04(121814)
Matrix: Aqueous
Date Sampled: 12/18/2014 0945
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/29/2014 1838	HKB	12/29/2014 1445	64180

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Description: HAO1SD06(121814)
Date Sampled: 12/18/2014 0840
Date Received: 12/19/2014

Laboratory ID: PL19009-004
Matrix: Solid
% Solids: 53.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3060A	(Hexavalent C) 7196A	1	12/24/2014 1100	BLB	12/23/2014 1610	63847

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		1.9	0.47	mg/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD06(121814)
Date Sampled: 12/18/2014 0840
Date Received: 12/19/2014

Laboratory ID: PL19009-004
Matrix: Solid
% Solids: 53.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Sample Wt.(g)
1	5035	8260B	1	12/21/2014 1648	DCS		63634	4.94

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	42		38	13	ug/kg	1
Benzene	71-43-2	8260B	ND		9.4	2.1	ug/kg	1
Bromodichloromethane	75-27-4	8260B	ND		9.4	3.2	ug/kg	1
Bromoform	75-25-2	8260B	ND		9.4	1.3	ug/kg	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		9.4	3.4	ug/kg	1
2-Butanone (MEK)	78-93-3	8260B	ND		19	4.5	ug/kg	1
Carbon disulfide	75-15-0	8260B	ND		9.4	2.5	ug/kg	1
Carbon tetrachloride	56-23-5	8260B	ND		9.4	3.4	ug/kg	1
Chlorobenzene	108-90-7	8260B	ND		9.4	3.2	ug/kg	1
Chloroethane	75-00-3	8260B	ND		9.4	2.5	ug/kg	1
Chloroform	67-66-3	8260B	ND		9.4	1.6	ug/kg	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		9.4	1.9	ug/kg	1
Cyclohexane	110-82-7	8260B	ND		9.4	1.3	ug/kg	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		9.4	2.8	ug/kg	1
Dibromochloromethane	124-48-1	8260B	ND		9.4	3.2	ug/kg	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		9.4	1.6	ug/kg	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		9.4	3.2	ug/kg	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		9.4	3.2	ug/kg	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		9.4	3.2	ug/kg	1
Dichlorodifluoromethane	75-71-8	8260B	ND		9.4	3.0	ug/kg	1
1,1-Dichloroethane	75-34-3	8260B	ND		9.4	1.4	ug/kg	1
1,2-Dichloroethane	107-06-2	8260B	ND		9.4	1.9	ug/kg	1
1,1-Dichloroethene	75-35-4	8260B	ND		9.4	3.2	ug/kg	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		9.4	1.4	ug/kg	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		9.4	2.8	ug/kg	1
1,2-Dichloropropane	78-87-5	8260B	ND		9.4	1.7	ug/kg	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		9.4	1.3	ug/kg	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		9.4	1.5	ug/kg	1
Ethylbenzene	100-41-4	8260B	ND		9.4	3.2	ug/kg	1
2-Hexanone	591-78-6	8260B	ND		19	2.5	ug/kg	1
Isopropylbenzene	98-82-8	8260B	ND		9.4	0.43	ug/kg	1
Methyl acetate	79-20-9	8260B	ND		9.4	1.8	ug/kg	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		9.4	0.75	ug/kg	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		19	2.8	ug/kg	1
Methylcyclohexane	108-87-2	8260B	ND		9.4	0.77	ug/kg	1
Methylene chloride	75-09-2	8260B	ND		9.4	4.9	ug/kg	1
Styrene	100-42-5	8260B	ND		9.4	2.1	ug/kg	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		9.4	0.89	ug/kg	1
Tetrachloroethene	127-18-4	8260B	ND		9.4	0.94	ug/kg	1
Toluene	108-88-3	8260B	ND		9.4	3.2	ug/kg	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		9.4	1.2	ug/kg	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		9.4	3.2	ug/kg	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		9.4	1.6	ug/kg	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		9.4	1.5	ug/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD06(121814)
Date Sampled: 12/18/2014 0840
Date Received: 12/19/2014

Laboratory ID: PL19009-004
Matrix: Solid
% Solids: 53.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Sample Wt.(g)
1	5035	8260B	1	12/21/2014 1648	DCS		63634	4.94

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Trichloroethene	79-01-6	8260B	ND		9.4	3.6	ug/kg	1
Trichlorofluoromethane	75-69-4	8260B	ND		9.4	2.8	ug/kg	1
Vinyl chloride	75-01-4	8260B	ND		9.4	1.6	ug/kg	1
Xylenes (total)	1330-20-7	8260B	ND		9.4	5.5	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		93	53-142
Bromofluorobenzene		94	47-138
Toluene-d8		92	68-124

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-004
Description: HAO1SD06(121814)
Matrix: Solid
Date Sampled: 12/18/2014 0840
% Solids: 53.7 12/19/2014 2009
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8270D	2	01/02/2015 1727	DRB1	12/29/2014 2057	64207

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acenaphthene	83-32-9	8270D	ND		610	200	ug/kg	1
Acenaphthylene	208-96-8	8270D	700		610	190	ug/kg	1
Acetophenone	98-86-2	8270D	ND		610	330	ug/kg	1
Anthracene	120-12-7	8270D	760		610	140	ug/kg	1
Atrazine	1912-24-9	8270D	ND		610	310	ug/kg	1
Benzaldehyde	100-52-7	8270D	ND		610	310	ug/kg	1
Benzo(a)anthracene	56-55-3	8270D	4800		610	160	ug/kg	1
Benzo(a)pyrene	50-32-8	8270D	5600		610	170	ug/kg	1
Benzo(b)fluoranthene	205-99-2	8270D	9600		610	180	ug/kg	1
Benzo(g,h,i)perylene	191-24-2	8270D	1600		610	210	ug/kg	1
Benzo(k)fluoranthene	207-08-9	8270D	4000		610	180	ug/kg	1
1,1'-Biphenyl	92-52-4	8270D	ND		610	180	ug/kg	1
4-Bromophenyl phenyl ether	101-55-3	8270D	ND		610	180	ug/kg	1
Butyl benzyl phthalate	85-68-7	8270D	ND		1200	410	ug/kg	1
Caprolactam	105-60-2	8270D	ND		610	310	ug/kg	1
Carbazole	86-74-8	8270D	300	J	610	260	ug/kg	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		610	160	ug/kg	1
4-Chloroaniline	106-47-8	8270D	ND		610	120	ug/kg	1
bis(2-Chloroethoxy)methane	111-91-1	8270D	ND		610	190	ug/kg	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		610	170	ug/kg	1
bis(2-Chloroisopropyl)ether	108-60-1	8270D	ND		610	200	ug/kg	1
2-Chloronaphthalene	91-58-7	8270D	ND		610	200	ug/kg	1
2-Chlorophenol	95-57-8	8270D	ND		610	170	ug/kg	1
4-Chlorophenyl phenyl ether	7005-72-3	8270D	ND		610	210	ug/kg	1
Chrysene	218-01-9	8270D	4900		610	200	ug/kg	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		610	170	ug/kg	1
Dibenzofuran	132-64-9	8270D	450	J	610	190	ug/kg	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		3100	670	ug/kg	1
2,4-Dichlorophenol	120-83-2	8270D	ND		610	190	ug/kg	1
Diethylphthalate	84-66-2	8270D	ND		610	200	ug/kg	1
Dimethyl phthalate	131-11-3	8270D	ND		610	200	ug/kg	1
2,4-Dimethylphenol	105-67-9	8270D	ND		610	230	ug/kg	1
Di-n-butyl phthalate	84-74-2	8270D	ND		610	320	ug/kg	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		3100	2400	ug/kg	1
2,4-Dinitrophenol	51-28-5	8270D	ND		3100	2100	ug/kg	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1200	340	ug/kg	1
2,6-Dinitrotoluene	606-20-2	8270D	ND		1200	320	ug/kg	1
Di-n-octylphthalate	117-84-0	8270D	ND		610	590	ug/kg	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		610	220	ug/kg	1
Fluoranthene	206-44-0	8270D	8200		610	190	ug/kg	1
Fluorene	86-73-7	8270D	1000		610	170	ug/kg	1
Hexachlorobenzene	118-74-1	8270D	ND		610	270	ug/kg	1
Hexachlorobutadiene	87-68-3	8270D	ND		610	200	ug/kg	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		3100	450	ug/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD06(121814)
Date Sampled: 12/18/2014 0840
Date Received: 12/19/2014

Laboratory ID: PL19009-004
Matrix: Solid
% Solids: 53.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8270D	2	01/02/2015 1727	DRB1	12/29/2014 2057	64207

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexachloroethane	67-72-1	8270D	ND		610	160	ug/kg	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	1900		610	180	ug/kg	1
Isophorone	78-59-1	8270D	ND		610	140	ug/kg	1
2-Methylnaphthalene	91-57-6	8270D	ND		610	180	ug/kg	1
2-Methylphenol	95-48-7	8270D	ND		610	110	ug/kg	1
3 & 4-Methylphenol	106-44-5	8270D	ND		1200	220	ug/kg	1
Naphthalene	91-20-3	8270D	ND		610	190	ug/kg	1
2-Nitroaniline	88-74-4	8270D	ND		1200	420	ug/kg	1
3-Nitroaniline	99-09-2	8270D	ND		1200	710	ug/kg	1
4-Nitroaniline	100-01-6	8270D	ND		1200	350	ug/kg	1
Nitrobenzene	98-95-3	8270D	ND		610	99	ug/kg	1
2-Nitrophenol	88-75-5	8270D	ND		1200	340	ug/kg	1
4-Nitrophenol	100-02-7	8270D	ND		3100	1800	ug/kg	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		610	240	ug/kg	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		610	150	ug/kg	1
Pentachlorophenol	87-86-5	8270D	ND		3100	2500	ug/kg	1
Phenanthrene	85-01-8	8270D	1100		610	170	ug/kg	1
Phenol	108-95-2	8270D	ND		610	170	ug/kg	1
Pyrene	129-00-0	8270D	5700		610	240	ug/kg	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		610	170	ug/kg	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		610	180	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		69	33-102
2-Fluorophenol		61	28-104
Nitrobenzene-d5		63	22-109
Phenol-d5		74	27-103
Terphenyl-d14		84	41-120
2,4,6-Tribromophenol		86	30-117

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Description: HAO1SD06(121814)
Date Sampled: 12/18/2014 0840
Date Received: 12/19/2014

Laboratory ID: PL19009-004
Matrix: Solid
% Solids: 53.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8081B	20	01/07/2015 1126	MEM	12/29/2014 0930	64120

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND		63	1.6	ug/kg	1
alpha-BHC	319-84-6	8081B	ND		63	1.7	ug/kg	1
beta-BHC	319-85-7	8081B	ND		63	1.3	ug/kg	1
delta-BHC	319-86-8	8081B	2.4	JP	63	0.78	ug/kg	1
gamma-BHC (Lindane)	58-89-9	8081B	ND		63	2.8	ug/kg	1
alpha-Chlordane	5103-71-9	8081B	ND		63	1.0	ug/kg	1
gamma-Chlordane	5103-74-2	8081B	ND		63	0.93	ug/kg	1
4,4'-DDD	72-54-8	8081B	3.6	JP	63	1.3	ug/kg	1
4,4'-DDE	72-55-9	8081B	ND		63	12	ug/kg	1
4,4'-DDT	50-29-3	8081B	6.2	JP	63	2.6	ug/kg	1
Dieldrin	60-57-1	8081B	ND		63	1.0	ug/kg	1
Endosulfan I	959-98-8	8081B	ND		63	1.5	ug/kg	1
Endosulfan II	33213-65-9	8081B	ND		63	1.2	ug/kg	1
Endosulfan sulfate	1031-07-8	8081B	ND		63	1.4	ug/kg	1
Endrin	72-20-8	8081B	6.8	JP	63	0.81	ug/kg	1
Endrin aldehyde	7421-93-4	8081B	6.0	JP	63	1.3	ug/kg	1
Endrin ketone	53494-70-5	8081B	15	JP	63	1.3	ug/kg	1
Heptachlor	76-44-8	8081B	ND		63	2.1	ug/kg	1
Heptachlor epoxide	1024-57-3	8081B	ND		63	1.3	ug/kg	1
Methoxychlor	72-43-5	8081B	11	JP	250	2.5	ug/kg	1
Toxaphene	8001-35-2	8081B	ND		3100	63	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl		100	57-110
Tetrachloro-m-xylene		54	37-91

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-004
Description: HAO1SD06(121814)
Matrix: Solid
Date Sampled: 12/18/2014 0840
% Solids: 53.7 12/19/2014 2009
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	7471B	7471B	1	12/31/2014 1250	COH	12/30/2014 1244	64167
1	3050B	6010C	1	01/02/2015 1614	ECS	12/29/2014 1651	63996

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	2.9		0.91	0.34	mg/kg	1
Barium	7440-39-3	6010C	18		2.4	0.16	mg/kg	1
Cadmium	7440-43-9	6010C	0.26		0.18	0.019	mg/kg	1
Chromium	7440-47-3	6010C	6.0		0.45	0.092	mg/kg	1
Lead	7439-92-1	6010C	16		0.91	0.17	mg/kg	1
Mercury	7439-97-6	7471B	0.019	J	0.15	0.011	mg/kg	1
Selenium	7782-49-2	6010C	0.54	J	0.91	0.31	mg/kg	1
Silver	7440-22-4	6010C	ND		0.45	0.076	mg/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Description: HAO1SD05(121814)
Date Sampled: 12/18/2014 0900
Date Received: 12/19/2014

Laboratory ID: PL19009-005
Matrix: Solid
% Solids: 67.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3060A	(Hexavalent C) 7196A	1	12/24/2014 1100	BLB	12/23/2014 1610	63847

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		1.5	0.37	mg/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD05(121814)
Date Sampled: 12/18/2014 0900
Date Received: 12/19/2014

Laboratory ID: PL19009-005
Matrix: Solid
% Solids: 67.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Sample Wt.(g)
1	5035	8260B	1	12/21/2014 1709	DCS		63634	5.53

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		27	9.0	ug/kg	1
Benzene	71-43-2	8260B	ND		6.7	1.5	ug/kg	1
Bromodichloromethane	75-27-4	8260B	ND		6.7	2.3	ug/kg	1
Bromoform	75-25-2	8260B	ND		6.7	0.94	ug/kg	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		6.7	2.4	ug/kg	1
2-Butanone (MEK)	78-93-3	8260B	ND		13	3.2	ug/kg	1
Carbon disulfide	75-15-0	8260B	ND		6.7	1.7	ug/kg	1
Carbon tetrachloride	56-23-5	8260B	ND		6.7	2.4	ug/kg	1
Chlorobenzene	108-90-7	8260B	ND		6.7	2.3	ug/kg	1
Chloroethane	75-00-3	8260B	ND		6.7	1.7	ug/kg	1
Chloroform	67-66-3	8260B	ND		6.7	1.1	ug/kg	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		6.7	1.3	ug/kg	1
Cyclohexane	110-82-7	8260B	ND		6.7	0.90	ug/kg	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		6.7	2.0	ug/kg	1
Dibromochloromethane	124-48-1	8260B	ND		6.7	2.3	ug/kg	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		6.7	1.1	ug/kg	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		6.7	2.3	ug/kg	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		6.7	2.3	ug/kg	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		6.7	2.3	ug/kg	1
Dichlorodifluoromethane	75-71-8	8260B	ND		6.7	2.1	ug/kg	1
1,1-Dichloroethane	75-34-3	8260B	ND		6.7	0.98	ug/kg	1
1,2-Dichloroethane	107-06-2	8260B	ND		6.7	1.3	ug/kg	1
1,1-Dichloroethene	75-35-4	8260B	ND		6.7	2.3	ug/kg	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		6.7	1.0	ug/kg	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		6.7	2.0	ug/kg	1
1,2-Dichloropropane	78-87-5	8260B	ND		6.7	1.2	ug/kg	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		6.7	0.91	ug/kg	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		6.7	1.1	ug/kg	1
Ethylbenzene	100-41-4	8260B	ND		6.7	2.3	ug/kg	1
2-Hexanone	591-78-6	8260B	ND		13	1.7	ug/kg	1
Isopropylbenzene	98-82-8	8260B	ND		6.7	0.31	ug/kg	1
Methyl acetate	79-20-9	8260B	ND		6.7	1.3	ug/kg	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		6.7	0.53	ug/kg	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		13	2.0	ug/kg	1
Methylcyclohexane	108-87-2	8260B	ND		6.7	0.55	ug/kg	1
Methylene chloride	75-09-2	8260B	ND		6.7	3.5	ug/kg	1
Styrene	100-42-5	8260B	ND		6.7	1.5	ug/kg	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		6.7	0.63	ug/kg	1
Tetrachloroethene	127-18-4	8260B	ND		6.7	0.67	ug/kg	1
Toluene	108-88-3	8260B	ND		6.7	2.3	ug/kg	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		6.7	0.84	ug/kg	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		6.7	2.3	ug/kg	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		6.7	1.1	ug/kg	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		6.7	1.1	ug/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD05(121814)
Date Sampled: 12/18/2014 0900
Date Received: 12/19/2014

Laboratory ID: PL19009-005
Matrix: Solid
% Solids: 67.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Sample Wt.(g)
1	5035	8260B	1	12/21/2014 1709	DCS		63634	5.53

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Trichloroethene	79-01-6	8260B	ND		6.7	2.5	ug/kg	1
Trichlorofluoromethane	75-69-4	8260B	ND		6.7	2.0	ug/kg	1
Vinyl chloride	75-01-4	8260B	ND		6.7	1.1	ug/kg	1
Xylenes (total)	1330-20-7	8260B	ND		6.7	3.9	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		95	53-142
Bromofluorobenzene		95	47-138
Toluene-d8		93	68-124

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD05(121814)
Date Sampled: 12/18/2014 0900
Date Received: 12/19/2014

Laboratory ID: PL19009-005
Matrix: Solid
% Solids: 67.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8270D	10	01/02/2015 1751	DRB1	12/29/2014 2057	64207

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acenaphthene	83-32-9	8270D	1200	J	2400	780	ug/kg	1
Acenaphthylene	208-96-8	8270D	4400		2400	760	ug/kg	1
Acetophenone	98-86-2	8270D	ND		2400	1300	ug/kg	1
Anthracene	120-12-7	8270D	9700		2400	540	ug/kg	1
Atrazine	1912-24-9	8270D	ND		2400	1200	ug/kg	1
Benzaldehyde	100-52-7	8270D	ND		2400	1200	ug/kg	1
Benzo(a)anthracene	56-55-3	8270D	39000		2400	650	ug/kg	1
Benzo(a)pyrene	50-32-8	8270D	35000		2400	680	ug/kg	1
Benzo(b)fluoranthene	205-99-2	8270D	51000		2400	700	ug/kg	1
Benzo(g,h,i)perylene	191-24-2	8270D	8700		2400	850	ug/kg	1
Benzo(k)fluoranthene	207-08-9	8270D	23000		2400	700	ug/kg	1
1,1'-Biphenyl	92-52-4	8270D	ND		2400	730	ug/kg	1
4-Bromophenyl phenyl ether	101-55-3	8270D	ND		2400	720	ug/kg	1
Butyl benzyl phthalate	85-68-7	8270D	ND		4900	1600	ug/kg	1
Caprolactam	105-60-2	8270D	ND		2400	1200	ug/kg	1
Carbazole	86-74-8	8270D	3800		2400	1000	ug/kg	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		2400	620	ug/kg	1
4-Chloroaniline	106-47-8	8270D	ND		2400	500	ug/kg	1
bis(2-Chloroethoxy)methane	111-91-1	8270D	ND		2400	740	ug/kg	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		2400	680	ug/kg	1
bis(2-Chloroisopropyl)ether	108-60-1	8270D	ND		2400	810	ug/kg	1
2-Chloronaphthalene	91-58-7	8270D	ND		2400	810	ug/kg	1
2-Chlorophenol	95-57-8	8270D	ND		2400	680	ug/kg	1
4-Chlorophenyl phenyl ether	7005-72-3	8270D	ND		2400	840	ug/kg	1
Chrysene	218-01-9	8270D	39000		2400	810	ug/kg	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		2400	670	ug/kg	1
Dibenzofuran	132-64-9	8270D	2000	J	2400	770	ug/kg	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		12000	2700	ug/kg	1
2,4-Dichlorophenol	120-83-2	8270D	ND		2400	760	ug/kg	1
Diethylphthalate	84-66-2	8270D	ND		2400	810	ug/kg	1
Dimethyl phthalate	131-11-3	8270D	ND		2400	810	ug/kg	1
2,4-Dimethylphenol	105-67-9	8270D	ND		2400	920	ug/kg	1
Di-n-butyl phthalate	84-74-2	8270D	ND		2400	1300	ug/kg	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		12000	9500	ug/kg	1
2,4-Dinitrophenol	51-28-5	8270D	ND		12000	8300	ug/kg	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		4900	1300	ug/kg	1
2,6-Dinitrotoluene	606-20-2	8270D	ND		4900	1300	ug/kg	1
Di-n-octylphthalate	117-84-0	8270D	ND		2400	2300	ug/kg	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		2400	860	ug/kg	1
Fluoranthene	206-44-0	8270D	94000		2400	770	ug/kg	1
Fluorene	86-73-7	8270D	4400		2400	660	ug/kg	1
Hexachlorobenzene	118-74-1	8270D	ND		2400	1100	ug/kg	1
Hexachlorobutadiene	87-68-3	8270D	ND		2400	800	ug/kg	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		12000	1800	ug/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD05(121814)
Date Sampled: 12/18/2014 0900
Date Received: 12/19/2014

Laboratory ID: PL19009-005
Matrix: Solid
% Solids: 67.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8270D	10	01/02/2015 1751	DRB1	12/29/2014 2057	64207

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexachloroethane	67-72-1	8270D	ND		2400	650	ug/kg	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	9600		2400	710	ug/kg	1
Isophorone	78-59-1	8270D	ND		2400	540	ug/kg	1
2-Methylnaphthalene	91-57-6	8270D	ND		2400	730	ug/kg	1
2-Methylphenol	95-48-7	8270D	ND		2400	440	ug/kg	1
3 & 4-Methylphenol	106-44-5	8270D	ND		4900	870	ug/kg	1
Naphthalene	91-20-3	8270D	ND		2400	750	ug/kg	1
2-Nitroaniline	88-74-4	8270D	ND		4900	1700	ug/kg	1
3-Nitroaniline	99-09-2	8270D	ND		4900	2800	ug/kg	1
4-Nitroaniline	100-01-6	8270D	ND		4900	1400	ug/kg	1
Nitrobenzene	98-95-3	8270D	ND		2400	390	ug/kg	1
2-Nitrophenol	88-75-5	8270D	ND		4900	1300	ug/kg	1
4-Nitrophenol	100-02-7	8270D	ND		12000	7100	ug/kg	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		2400	940	ug/kg	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		2400	610	ug/kg	1
Pentachlorophenol	87-86-5	8270D	ND		12000	10000	ug/kg	1
Phenanthrene	85-01-8	8270D	36000		2400	660	ug/kg	1
Phenol	108-95-2	8270D	ND		2400	660	ug/kg	1
Pyrene	129-00-0	8270D	63000		2400	970	ug/kg	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		2400	680	ug/kg	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		2400	720	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		79	33-102
2-Fluorophenol		62	28-104
Nitrobenzene-d5		71	22-109
Phenol-d5		70	27-103
Terphenyl-d14		93	41-120
2,4,6-Tribromophenol	N	211	30-117

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Description: HAO1SD05(121814)
Date Sampled: 12/18/2014 0900
Date Received: 12/19/2014

Laboratory ID: PL19009-005
Matrix: Solid
% Solids: 67.7 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8081B	20	01/07/2015 1151	MEM	12/29/2014 0930	64120

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND		49	1.2	ug/kg	1
alpha-BHC	319-84-6	8081B	ND		49	1.3	ug/kg	1
beta-BHC	319-85-7	8081B	ND		49	1.0	ug/kg	1
delta-BHC	319-86-8	8081B	ND		49	0.60	ug/kg	1
gamma-BHC (Lindane)	58-89-9	8081B	ND		49	2.2	ug/kg	1
alpha-Chlordane	5103-71-9	8081B	5.5	J	49	0.81	ug/kg	1
gamma-Chlordane	5103-74-2	8081B	3.6	JP	49	0.72	ug/kg	1
4,4'-DDD	72-54-8	8081B	38	JP	49	1.0	ug/kg	1
4,4'-DDE	72-55-9	8081B	ND		49	9.2	ug/kg	1
4,4'-DDT	50-29-3	8081B	13	JP	49	2.0	ug/kg	1
Dieldrin	60-57-1	8081B	5.1	J	49	0.81	ug/kg	1
Endosulfan I	959-98-8	8081B	ND		49	1.2	ug/kg	1
Endosulfan II	33213-65-9	8081B	3.9	JP	49	0.92	ug/kg	1
Endosulfan sulfate	1031-07-8	8081B	5.2	JP	49	1.1	ug/kg	1
Endrin	72-20-8	8081B	5.9	JP	49	0.63	ug/kg	1
Endrin aldehyde	7421-93-4	8081B	17	JP	49	1.0	ug/kg	1
Endrin ketone	53494-70-5	8081B	80		49	1.0	ug/kg	1
Heptachlor	76-44-8	8081B	ND		49	1.6	ug/kg	1
Heptachlor epoxide	1024-57-3	8081B	ND		49	1.0	ug/kg	1
Methoxychlor	72-43-5	8081B	110	JP	190	1.9	ug/kg	1
Toxaphene	8001-35-2	8081B	ND		2400	49	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl	N	181	57-110
Tetrachloro-m-xylene		63	37-91

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-005
Description: HAO1SD05(121814)
Matrix: Solid
Date Sampled: 12/18/2014 0900
% Solids: 67.7 12/19/2014 2009
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	7471B	7471B	1	12/31/2014 1252	COH	12/30/2014 1244	64167
1	3050B	6010C	1	01/02/2015 1631	ECS	12/29/2014 1651	63996

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	1.0		0.71	0.27	mg/kg	1
Barium	7440-39-3	6010C	16		1.8	0.13	mg/kg	1
Cadmium	7440-43-9	6010C	0.33		0.14	0.015	mg/kg	1
Chromium	7440-47-3	6010C	9.1		0.35	0.072	mg/kg	1
Lead	7439-92-1	6010C	18		0.71	0.13	mg/kg	1
Mercury	7439-97-6	7471B	ND		0.11	0.0080	mg/kg	1
Selenium	7782-49-2	6010C	ND		0.71	0.25	mg/kg	1
Silver	7440-22-4	6010C	ND		0.35	0.059	mg/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Description: HAO1SD04(121814)
Date Sampled: 12/18/2014 0930
Date Received: 12/19/2014

Laboratory ID: PL19009-006
Matrix: Solid
% Solids: 67.9 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3060A	(Hexavalent C) 7196A	1	12/24/2014 1100	BLB	12/23/2014 1610	63847

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		1.5	0.37	mg/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD04(121814)
Date Sampled: 12/18/2014 0930
Date Received: 12/19/2014

Laboratory ID: PL19009-006
Matrix: Solid
% Solids: 67.9 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Sample Wt.(g)
1	5035	8260B	1	12/24/2014 1432	DCS		63946	5.91

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		25	8.3	ug/kg	1
Benzene	71-43-2	8260B	ND		6.2	1.4	ug/kg	1
Bromodichloromethane	75-27-4	8260B	ND		6.2	2.1	ug/kg	1
Bromoform	75-25-2	8260B	ND		6.2	0.87	ug/kg	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		6.2	2.2	ug/kg	1
2-Butanone (MEK)	78-93-3	8260B	ND		12	3.0	ug/kg	1
Carbon disulfide	75-15-0	8260B	ND		6.2	1.6	ug/kg	1
Carbon tetrachloride	56-23-5	8260B	ND		6.2	2.2	ug/kg	1
Chlorobenzene	108-90-7	8260B	ND		6.2	2.1	ug/kg	1
Chloroethane	75-00-3	8260B	ND		6.2	1.6	ug/kg	1
Chloroform	67-66-3	8260B	ND		6.2	1.0	ug/kg	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		6.2	1.2	ug/kg	1
Cyclohexane	110-82-7	8260B	ND		6.2	0.84	ug/kg	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		6.2	1.9	ug/kg	1
Dibromochloromethane	124-48-1	8260B	ND		6.2	2.1	ug/kg	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		6.2	1.1	ug/kg	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		6.2	2.1	ug/kg	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		6.2	2.1	ug/kg	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		6.2	2.1	ug/kg	1
Dichlorodifluoromethane	75-71-8	8260B	ND		6.2	2.0	ug/kg	1
1,1-Dichloroethane	75-34-3	8260B	ND		6.2	0.91	ug/kg	1
1,2-Dichloroethane	107-06-2	8260B	ND		6.2	1.2	ug/kg	1
1,1-Dichloroethene	75-35-4	8260B	ND		6.2	2.1	ug/kg	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		6.2	0.95	ug/kg	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		6.2	1.9	ug/kg	1
1,2-Dichloropropane	78-87-5	8260B	ND		6.2	1.1	ug/kg	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		6.2	0.85	ug/kg	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		6.2	1.0	ug/kg	1
Ethylbenzene	100-41-4	8260B	ND		6.2	2.1	ug/kg	1
2-Hexanone	591-78-6	8260B	ND		12	1.6	ug/kg	1
Isopropylbenzene	98-82-8	8260B	0.87	J	6.2	0.29	ug/kg	1
Methyl acetate	79-20-9	8260B	ND		6.2	1.2	ug/kg	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		6.2	0.50	ug/kg	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		12	1.9	ug/kg	1
Methylcyclohexane	108-87-2	8260B	ND		6.2	0.51	ug/kg	1
Methylene chloride	75-09-2	8260B	ND		6.2	3.2	ug/kg	1
Styrene	100-42-5	8260B	ND		6.2	1.4	ug/kg	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		6.2	0.59	ug/kg	1
Tetrachloroethene	127-18-4	8260B	ND		6.2	0.62	ug/kg	1
Toluene	108-88-3	8260B	ND		6.2	2.1	ug/kg	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		6.2	0.78	ug/kg	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		6.2	2.1	ug/kg	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		6.2	1.1	ug/kg	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		6.2	0.98	ug/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD04(121814)
Date Sampled: 12/18/2014 0930
Date Received: 12/19/2014

Laboratory ID: PL19009-006
Matrix: Solid
% Solids: 67.9 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Sample Wt.(g)
1	5035	8260B	1	12/24/2014 1432	DCS		63946	5.91

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Trichloroethene	79-01-6	8260B	ND		6.2	2.4	ug/kg	1
Trichlorofluoromethane	75-69-4	8260B	ND		6.2	1.9	ug/kg	1
Vinyl chloride	75-01-4	8260B	ND		6.2	1.1	ug/kg	1
Xylenes (total)	1330-20-7	8260B	ND		6.2	3.6	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		90	53-142
Bromofluorobenzene		95	47-138
Toluene-d8		88	68-124

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD04(121814)
Date Sampled: 12/18/2014 0930
Date Received: 12/19/2014

Laboratory ID: PL19009-006
Matrix: Solid
% Solids: 67.9 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8270D	1	12/30/2014 1533	DRB1	12/29/2014 2057	64207

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acenaphthene	83-32-9	8270D	ND		49	16	ug/kg	1
Acenaphthylene	208-96-8	8270D	ND		49	15	ug/kg	1
Acetophenone	98-86-2	8270D	ND		49	26	ug/kg	1
Anthracene	120-12-7	8270D	ND		49	11	ug/kg	1
Atrazine	1912-24-9	8270D	ND		49	25	ug/kg	1
Benzaldehyde	100-52-7	8270D	ND		49	25	ug/kg	1
Benzo(a)anthracene	56-55-3	8270D	ND		49	13	ug/kg	1
Benzo(a)pyrene	50-32-8	8270D	ND		49	14	ug/kg	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		49	14	ug/kg	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		49	17	ug/kg	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		49	14	ug/kg	1
1,1'-Biphenyl	92-52-4	8270D	ND		49	15	ug/kg	1
4-Bromophenyl phenyl ether	101-55-3	8270D	ND		49	14	ug/kg	1
Butyl benzyl phthalate	85-68-7	8270D	ND		99	32	ug/kg	1
Caprolactam	105-60-2	8270D	ND		49	25	ug/kg	1
Carbazole	86-74-8	8270D	ND		49	21	ug/kg	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		49	12	ug/kg	1
4-Chloroaniline	106-47-8	8270D	ND		49	10	ug/kg	1
bis(2-Chloroethoxy)methane	111-91-1	8270D	ND		49	15	ug/kg	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		49	14	ug/kg	1
bis(2-Chloroisopropyl)ether	108-60-1	8270D	ND		49	16	ug/kg	1
2-Chloronaphthalene	91-58-7	8270D	ND		49	16	ug/kg	1
2-Chlorophenol	95-57-8	8270D	ND		49	14	ug/kg	1
4-Chlorophenyl phenyl ether	7005-72-3	8270D	ND		49	17	ug/kg	1
Chrysene	218-01-9	8270D	ND		49	16	ug/kg	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		49	13	ug/kg	1
Dibenzofuran	132-64-9	8270D	ND		49	15	ug/kg	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		250	53	ug/kg	1
2,4-Dichlorophenol	120-83-2	8270D	ND		49	15	ug/kg	1
Diethylphthalate	84-66-2	8270D	ND		49	16	ug/kg	1
Dimethyl phthalate	131-11-3	8270D	ND		49	16	ug/kg	1
2,4-Dimethylphenol	105-67-9	8270D	ND		49	18	ug/kg	1
Di-n-butyl phthalate	84-74-2	8270D	ND		49	26	ug/kg	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		250	190	ug/kg	1
2,4-Dinitrophenol	51-28-5	8270D	ND		250	170	ug/kg	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		99	27	ug/kg	1
2,6-Dinitrotoluene	606-20-2	8270D	ND		99	25	ug/kg	1
Di-n-octylphthalate	117-84-0	8270D	ND		49	47	ug/kg	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		49	17	ug/kg	1
Fluoranthene	206-44-0	8270D	ND		49	16	ug/kg	1
Fluorene	86-73-7	8270D	ND		49	13	ug/kg	1
Hexachlorobenzene	118-74-1	8270D	ND		49	22	ug/kg	1
Hexachlorobutadiene	87-68-3	8270D	ND		49	16	ug/kg	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		250	36	ug/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Description: HAO1SD04(121814)
Date Sampled: 12/18/2014 0930
Date Received: 12/19/2014

Laboratory ID: PL19009-006
Matrix: Solid
% Solids: 67.9 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8270D	1	12/30/2014 1533	DRB1	12/29/2014 2057	64207

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexachloroethane	67-72-1	8270D	ND		49	13	ug/kg	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		49	14	ug/kg	1
Isophorone	78-59-1	8270D	ND		49	11	ug/kg	1
2-Methylnaphthalene	91-57-6	8270D	ND		49	15	ug/kg	1
2-Methylphenol	95-48-7	8270D	ND		49	8.9	ug/kg	1
3 & 4-Methylphenol	106-44-5	8270D	ND		99	18	ug/kg	1
Naphthalene	91-20-3	8270D	ND		49	15	ug/kg	1
2-Nitroaniline	88-74-4	8270D	ND		99	34	ug/kg	1
3-Nitroaniline	99-09-2	8270D	ND		99	57	ug/kg	1
4-Nitroaniline	100-01-6	8270D	ND		99	28	ug/kg	1
Nitrobenzene	98-95-3	8270D	ND		49	7.9	ug/kg	1
2-Nitrophenol	88-75-5	8270D	ND		99	27	ug/kg	1
4-Nitrophenol	100-02-7	8270D	ND		250	140	ug/kg	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		49	19	ug/kg	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		49	12	ug/kg	1
Pentachlorophenol	87-86-5	8270D	ND		250	200	ug/kg	1
Phenanthrene	85-01-8	8270D	ND		49	13	ug/kg	1
Phenol	108-95-2	8270D	ND		49	13	ug/kg	1
Pyrene	129-00-0	8270D	ND		49	19	ug/kg	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		49	14	ug/kg	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		49	14	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		43	33-102
2-Fluorophenol		46	28-104
Nitrobenzene-d5		40	22-109
Phenol-d5		47	27-103
Terphenyl-d14		55	41-120
2,4,6-Tribromophenol		46	30-117

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Description: HAO1SD04(121814)
Date Sampled: 12/18/2014 0930
Date Received: 12/19/2014

Laboratory ID: PL19009-006
Matrix: Solid
% Solids: 67.9 12/19/2014 2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	8081B	20	01/07/2015 1206	MEM	12/29/2014 0930	64120

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	1.5	JP	48	1.2	ug/kg	1
alpha-BHC	319-84-6	8081B	ND		48	1.3	ug/kg	1
beta-BHC	319-85-7	8081B	ND		48	1.0	ug/kg	1
delta-BHC	319-86-8	8081B	ND		48	0.59	ug/kg	1
gamma-BHC (Lindane)	58-89-9	8081B	ND		48	2.1	ug/kg	1
alpha-Chlordane	5103-71-9	8081B	1.3	JP	48	0.79	ug/kg	1
gamma-Chlordane	5103-74-2	8081B	1.4	JP	48	0.70	ug/kg	1
4,4'-DDD	72-54-8	8081B	11	JP	48	1.0	ug/kg	1
4,4'-DDE	72-55-9	8081B	ND		48	9.0	ug/kg	1
4,4'-DDT	50-29-3	8081B	12	JP	48	2.0	ug/kg	1
Dieldrin	60-57-1	8081B	4.1	JP	48	0.79	ug/kg	1
Endosulfan I	959-98-8	8081B	1.6	JP	48	1.2	ug/kg	1
Endosulfan II	33213-65-9	8081B	2.8	JP	48	0.90	ug/kg	1
Endosulfan sulfate	1031-07-8	8081B	29	JP	48	1.0	ug/kg	1
Endrin	72-20-8	8081B	14	JP	48	0.62	ug/kg	1
Endrin aldehyde	7421-93-4	8081B	21	JP	48	1.0	ug/kg	1
Endrin ketone	53494-70-5	8081B	45	JP	48	1.0	ug/kg	1
Heptachlor	76-44-8	8081B	ND		48	1.6	ug/kg	1
Heptachlor epoxide	1024-57-3	8081B	ND		48	1.0	ug/kg	1
Methoxychlor	72-43-5	8081B	80	JP	190	1.9	ug/kg	1
Toxaphene	8001-35-2	8081B	ND		2300	48	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl	N	257	57-110
Tetrachloro-m-xylene		62	37-91

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-006
Description: HAO1SD04(121814)
Matrix: Solid
Date Sampled: 12/18/2014 0930
% Solids: 67.9 12/19/2014 2009
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	7471B	7471B	1	12/31/2014 1258	COH	12/30/2014 1244	64167
1	3050B	6010C	1	01/02/2015 1635	ECS	12/29/2014 1651	63996

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	0.65	J	0.71	0.27	mg/kg	1
Barium	7440-39-3	6010C	15		1.8	0.13	mg/kg	1
Cadmium	7440-43-9	6010C	0.23		0.14	0.015	mg/kg	1
Chromium	7440-47-3	6010C	3.8		0.35	0.072	mg/kg	1
Lead	7439-92-1	6010C	10		0.71	0.13	mg/kg	1
Mercury	7439-97-6	7471B	ND		0.12	0.0086	mg/kg	1
Selenium	7782-49-2	6010C	0.26	J	0.71	0.25	mg/kg	1
Silver	7440-22-4	6010C	ND		0.35	0.060	mg/kg	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-007
Description: TRIP BLANK
Matrix: Aqueous
Date Sampled: 12/18/2014
Date Received: 12/19/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/29/2014 1120	DCS		64151

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	0.59	J	1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	0.36	J	1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL19009-007
Description: TRIP BLANK
Matrix: Aqueous
Date Sampled: 12/18/2014
Date Received: 12/19/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		104	70-130
Bromofluorobenzene		114	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

QC Summary

Inorganic non-metals - MB

Sample ID: PQ63536-001
Batch: 63536
Analytical Method: 7196A

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Hexavalent Chromium	ND		1	0.020	0.0081	mg/L	12/19/2014 1315

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: PQ63536-002
Batch: 63536
Analytical Method: 7196A

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	0.10	0.098		1	98	90-110	12/19/2014 1315

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL19009-001MS
Batch: 63536
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	ND	0.10	0.093		1	93	75-125	12/19/2014 1315

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: PL19009-001MD
Batch: 63536
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Hexavalent Chromium	ND	0.10	0.091		1	91	1.9	75-125	20	12/19/2014 1315

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL19009-004MS
Batch: 63847
Analytical Method: 7196A

Matrix: Solid
Prep Method: 3060A
Prep Date: 12/23/2014 1610

Parameter	Sample Amount (mg/kg)	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	ND	7.5	ND	N	1	0.00	75-125	12/24/2014 1100

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: PL19009-004MD
Batch: 63847
Analytical Method: 7196A

Matrix: Solid
Prep Method: 3060A
Prep Date: 12/23/2014 1610

Parameter	Sample Amount (mg/kg)	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Hexavalent Chromium	ND	7.5	ND	N	1	0.00	0.00	75-125	20	12/24/2014 1100

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL19009-005MS
Batch: 63847
Analytical Method: 7196A

Matrix: Solid
Prep Method: 3060A
Prep Date: 12/23/2014 1610

Parameter	Sample Amount (mg/kg)	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	ND	5.9	2.3	N	1	39	75-125	12/24/2014 1100

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL19009-006MS
Batch: 63847
Analytical Method: 7196A

Matrix: Solid
Prep Method: 3060A
Prep Date: 12/23/2014 1610

Parameter	Sample Amount (mg/kg)	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	ND	5.9	400	N	50	6740	75-125	12/24/2014 1100

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ63634-001
Batch: 63634
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/kg	12/21/2014 1335
Benzene	ND		1	5.0	1.1	ug/kg	12/21/2014 1335
Bromodichloromethane	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
Bromoform	ND		1	5.0	0.70	ug/kg	12/21/2014 1335
Bromomethane (Methyl bromide)	ND		1	5.0	1.8	ug/kg	12/21/2014 1335
2-Butanone (MEK)	ND		1	10	2.4	ug/kg	12/21/2014 1335
Carbon disulfide	ND		1	5.0	1.3	ug/kg	12/21/2014 1335
Carbon tetrachloride	ND		1	5.0	1.8	ug/kg	12/21/2014 1335
Chlorobenzene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
Chloroethane	ND		1	5.0	1.3	ug/kg	12/21/2014 1335
Chloroform	ND		1	5.0	0.83	ug/kg	12/21/2014 1335
Chloromethane (Methyl chloride)	ND		1	5.0	1.0	ug/kg	12/21/2014 1335
Cyclohexane	ND		1	5.0	0.67	ug/kg	12/21/2014 1335
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	5.0	1.5	ug/kg	12/21/2014 1335
Dibromochloromethane	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
1,2-Dibromoethane (EDB)	ND		1	5.0	0.85	ug/kg	12/21/2014 1335
1,4-Dichlorobenzene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
1,2-Dichlorobenzene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
1,3-Dichlorobenzene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
Dichlorodifluoromethane	ND		1	5.0	1.6	ug/kg	12/21/2014 1335
1,2-Dichloroethane	ND		1	5.0	1.0	ug/kg	12/21/2014 1335
1,1-Dichloroethane	ND		1	5.0	0.73	ug/kg	12/21/2014 1335
1,1-Dichloroethene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
trans-1,2-Dichloroethene	ND		1	5.0	1.5	ug/kg	12/21/2014 1335
cis-1,2-Dichloroethene	ND		1	5.0	0.76	ug/kg	12/21/2014 1335
1,2-Dichloropropane	ND		1	5.0	0.91	ug/kg	12/21/2014 1335
trans-1,3-Dichloropropene	ND		1	5.0	0.82	ug/kg	12/21/2014 1335
cis-1,3-Dichloropropene	ND		1	5.0	0.68	ug/kg	12/21/2014 1335
Ethylbenzene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
2-Hexanone	2.0	J	1	10	1.3	ug/kg	12/21/2014 1335
Isopropylbenzene	ND		1	5.0	0.23	ug/kg	12/21/2014 1335
Methyl acetate	ND		1	5.0	0.98	ug/kg	12/21/2014 1335
Methyl tertiary butyl ether (MTBE)	ND		1	5.0	0.40	ug/kg	12/21/2014 1335
4-Methyl-2-pentanone	ND		1	10	1.5	ug/kg	12/21/2014 1335
Methylcyclohexane	ND		1	5.0	0.41	ug/kg	12/21/2014 1335
Methylene chloride	ND		1	5.0	2.6	ug/kg	12/21/2014 1335
Styrene	ND		1	5.0	1.1	ug/kg	12/21/2014 1335
1,1,2,2-Tetrachloroethane	ND		1	5.0	0.47	ug/kg	12/21/2014 1335
Tetrachloroethene	ND		1	5.0	0.50	ug/kg	12/21/2014 1335
Toluene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		1	5.0	0.63	ug/kg	12/21/2014 1335
1,2,4-Trichlorobenzene	ND		1	5.0	1.7	ug/kg	12/21/2014 1335
1,1,1-Trichloroethane	ND		1	5.0	0.85	ug/kg	12/21/2014 1335
1,1,2-Trichloroethane	ND		1	5.0	0.79	ug/kg	12/21/2014 1335

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ63634-001
Batch: 63634
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Trichloroethene	ND		1	5.0	1.9	ug/kg	12/21/2014 1335
Trichlorofluoromethane	ND		1	5.0	1.5	ug/kg	12/21/2014 1335
Vinyl chloride	ND		1	5.0	0.86	ug/kg	12/21/2014 1335
Xylenes (total)	ND		1	5.0	2.9	ug/kg	12/21/2014 1335

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		101	47-138
1,2-Dichloroethane-d4		96	53-142
Toluene-d8		96	68-124

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ63634-002
Batch: 63634
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	130		1	126	60-140	12/21/2014 1239
Benzene	50	47		1	95	69-123	12/21/2014 1239
Bromodichloromethane	50	47		1	95	69-121	12/21/2014 1239
Bromoform	50	48		1	96	61-119	12/21/2014 1239
Bromomethane (Methyl bromide)	50	53		1	106	10-168	12/21/2014 1239
2-Butanone (MEK)	100	110		1	106	57-148	12/21/2014 1239
Carbon disulfide	50	49		1	97	58-122	12/21/2014 1239
Carbon tetrachloride	50	48		1	95	58-136	12/21/2014 1239
Chlorobenzene	50	46		1	92	59-129	12/21/2014 1239
Chloroethane	50	53		1	106	42-163	12/21/2014 1239
Chloroform	50	49		1	98	71-125	12/21/2014 1239
Chloromethane (Methyl chloride)	50	55		1	109	34-134	12/21/2014 1239
Cyclohexane	50	46		1	91	53-139	12/21/2014 1239
1,2-Dibromo-3-chloropropane (DBCP)	50	47		1	95	55-125	12/21/2014 1239
Dibromochloromethane	50	47		1	94	66-119	12/21/2014 1239
1,2-Dibromoethane (EDB)	50	47		1	93	74-124	12/21/2014 1239
1,4-Dichlorobenzene	50	46		1	92	52-133	12/21/2014 1239
1,2-Dichlorobenzene	50	46		1	92	57-131	12/21/2014 1239
1,3-Dichlorobenzene	50	47		1	93	51-134	12/21/2014 1239
Dichlorodifluoromethane	50	59		1	117	10-157	12/21/2014 1239
1,2-Dichloroethane	50	48		1	96	67-129	12/21/2014 1239
1,1-Dichloroethane	50	49		1	99	71-127	12/21/2014 1239
1,1-Dichloroethene	50	50		1	100	69-138	12/21/2014 1239
trans-1,2-Dichloroethene	50	50		1	100	68-131	12/21/2014 1239
cis-1,2-Dichloroethene	50	50		1	100	70-122	12/21/2014 1239
1,2-Dichloropropane	50	47		1	95	72-124	12/21/2014 1239
trans-1,3-Dichloropropene	50	47		1	94	70-124	12/21/2014 1239
cis-1,3-Dichloropropene	50	47		1	93	70-126	12/21/2014 1239
Ethylbenzene	50	46		1	92	59-128	12/21/2014 1239
2-Hexanone	100	100		1	103	54-137	12/21/2014 1239
Isopropylbenzene	50	46		1	92	50-136	12/21/2014 1239
Methyl acetate	50	56		1	113	59-137	12/21/2014 1239
Methyl tertiary butyl ether (MTBE)	50	50		1	100	70-130	12/21/2014 1239
4-Methyl-2-pentanone	100	100		1	102	60-134	12/21/2014 1239
Methylcyclohexane	50	49		1	98	41-144	12/21/2014 1239
Methylene chloride	50	50		1	99	70-130	12/21/2014 1239
Styrene	50	49		1	99	54-136	12/21/2014 1239
1,1,2,2-Tetrachloroethane	50	47		1	94	69-132	12/21/2014 1239
Tetrachloroethene	50	47		1	94	45-150	12/21/2014 1239
Toluene	50	46		1	92	61-129	12/21/2014 1239
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	52		1	105	49-136	12/21/2014 1239
1,2,4-Trichlorobenzene	50	43		1	87	34-145	12/21/2014 1239
1,1,1-Trichloroethane	50	48		1	96	63-128	12/21/2014 1239
1,1,2-Trichloroethane	50	47		1	94	55-128	12/21/2014 1239

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ63634-002
Batch: 63634
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Trichloroethene	50	47		1	94	62-126	12/21/2014 1239
Trichlorofluoromethane	50	52		1	104	45-138	12/21/2014 1239
Vinyl chloride	50	53		1	106	42-132	12/21/2014 1239
Xylenes (total)	100	96		1	96	58-128	12/21/2014 1239

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		107	47-138
1,2-Dichloroethane-d4		105	53-142
Toluene-d8		110	68-124

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ63946-001
Batch: 63946
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/kg	12/24/2014 1106
Benzene	ND		1	5.0	1.1	ug/kg	12/24/2014 1106
Bromodichloromethane	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
Bromoform	ND		1	5.0	0.70	ug/kg	12/24/2014 1106
Bromomethane (Methyl bromide)	ND		1	5.0	1.8	ug/kg	12/24/2014 1106
2-Butanone (MEK)	ND		1	10	2.4	ug/kg	12/24/2014 1106
Carbon disulfide	ND		1	5.0	1.3	ug/kg	12/24/2014 1106
Carbon tetrachloride	ND		1	5.0	1.8	ug/kg	12/24/2014 1106
Chlorobenzene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
Chloroethane	ND		1	5.0	1.3	ug/kg	12/24/2014 1106
Chloroform	ND		1	5.0	0.83	ug/kg	12/24/2014 1106
Chloromethane (Methyl chloride)	ND		1	5.0	1.0	ug/kg	12/24/2014 1106
Cyclohexane	ND		1	5.0	0.67	ug/kg	12/24/2014 1106
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	5.0	1.5	ug/kg	12/24/2014 1106
Dibromochloromethane	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
1,2-Dibromoethane (EDB)	ND		1	5.0	0.85	ug/kg	12/24/2014 1106
1,3-Dichlorobenzene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
1,2-Dichlorobenzene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
1,4-Dichlorobenzene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
Dichlorodifluoromethane	ND		1	5.0	1.6	ug/kg	12/24/2014 1106
1,1-Dichloroethane	ND		1	5.0	0.73	ug/kg	12/24/2014 1106
1,2-Dichloroethane	ND		1	5.0	1.0	ug/kg	12/24/2014 1106
1,1-Dichloroethene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
cis-1,2-Dichloroethene	ND		1	5.0	0.76	ug/kg	12/24/2014 1106
trans-1,2-Dichloroethene	ND		1	5.0	1.5	ug/kg	12/24/2014 1106
1,2-Dichloropropane	ND		1	5.0	0.91	ug/kg	12/24/2014 1106
cis-1,3-Dichloropropene	ND		1	5.0	0.68	ug/kg	12/24/2014 1106
trans-1,3-Dichloropropene	ND		1	5.0	0.82	ug/kg	12/24/2014 1106
Ethylbenzene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
2-Hexanone	1.6	J	1	10	1.3	ug/kg	12/24/2014 1106
Isopropylbenzene	ND		1	5.0	0.23	ug/kg	12/24/2014 1106
Methyl acetate	ND		1	5.0	0.98	ug/kg	12/24/2014 1106
Methyl tertiary butyl ether (MTBE)	ND		1	5.0	0.40	ug/kg	12/24/2014 1106
4-Methyl-2-pentanone	ND		1	10	1.5	ug/kg	12/24/2014 1106
Methylcyclohexane	ND		1	5.0	0.41	ug/kg	12/24/2014 1106
Methylene chloride	ND		1	5.0	2.6	ug/kg	12/24/2014 1106
Styrene	ND		1	5.0	1.1	ug/kg	12/24/2014 1106
1,1,2,2-Tetrachloroethane	ND		1	5.0	0.47	ug/kg	12/24/2014 1106
Tetrachloroethene	ND		1	5.0	0.50	ug/kg	12/24/2014 1106
Toluene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		1	5.0	0.63	ug/kg	12/24/2014 1106
1,2,4-Trichlorobenzene	ND		1	5.0	1.7	ug/kg	12/24/2014 1106
1,1,2-Trichloroethane	ND		1	5.0	0.79	ug/kg	12/24/2014 1106
1,1,1-Trichloroethane	ND		1	5.0	0.85	ug/kg	12/24/2014 1106

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ63946-001
Batch: 63946
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Trichloroethene	ND		1	5.0	1.9	ug/kg	12/24/2014 1106
Trichlorofluoromethane	ND		1	5.0	1.5	ug/kg	12/24/2014 1106
Vinyl chloride	ND		1	5.0	0.86	ug/kg	12/24/2014 1106
Xylenes (total)	ND		1	5.0	2.9	ug/kg	12/24/2014 1106

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		92	47-138
1,2-Dichloroethane-d4		93	53-142
Toluene-d8		91	68-124

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ63946-002
Batch: 63946
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	98		1	98	60-140	12/24/2014 1009
Benzene	50	47		1	94	69-123	12/24/2014 1009
Bromodichloromethane	50	48		1	96	69-121	12/24/2014 1009
Bromoform	50	46		1	92	61-119	12/24/2014 1009
Bromomethane (Methyl bromide)	50	54		1	107	10-168	12/24/2014 1009
2-Butanone (MEK)	100	95		1	95	57-148	12/24/2014 1009
Carbon disulfide	50	49		1	99	58-122	12/24/2014 1009
Carbon tetrachloride	50	48		1	96	58-136	12/24/2014 1009
Chlorobenzene	50	47		1	95	59-129	12/24/2014 1009
Chloroethane	50	52		1	104	42-163	12/24/2014 1009
Chloroform	50	47		1	93	71-125	12/24/2014 1009
Chloromethane (Methyl chloride)	50	53		1	107	34-134	12/24/2014 1009
Cyclohexane	50	51		1	102	53-139	12/24/2014 1009
1,2-Dibromo-3-chloropropane (DBCP)	50	45		1	90	55-125	12/24/2014 1009
Dibromochloromethane	50	48		1	95	66-119	12/24/2014 1009
1,2-Dibromoethane (EDB)	50	46		1	93	74-124	12/24/2014 1009
1,3-Dichlorobenzene	50	48		1	96	51-134	12/24/2014 1009
1,2-Dichlorobenzene	50	47		1	93	57-131	12/24/2014 1009
1,4-Dichlorobenzene	50	46		1	93	52-133	12/24/2014 1009
Dichlorodifluoromethane	50	58		1	117	10-157	12/24/2014 1009
1,1-Dichloroethane	50	47		1	95	71-127	12/24/2014 1009
1,2-Dichloroethane	50	46		1	92	67-129	12/24/2014 1009
1,1-Dichloroethene	50	51		1	101	69-138	12/24/2014 1009
cis-1,2-Dichloroethene	50	48		1	95	70-122	12/24/2014 1009
trans-1,2-Dichloroethene	50	48		1	96	68-131	12/24/2014 1009
1,2-Dichloropropane	50	47		1	94	72-124	12/24/2014 1009
cis-1,3-Dichloropropene	50	48		1	96	70-126	12/24/2014 1009
trans-1,3-Dichloropropene	50	49		1	97	70-124	12/24/2014 1009
Ethylbenzene	50	49		1	99	59-128	12/24/2014 1009
2-Hexanone	100	90		1	90	54-137	12/24/2014 1009
Isopropylbenzene	50	50		1	101	50-136	12/24/2014 1009
Methyl acetate	50	49		1	97	59-137	12/24/2014 1009
Methyl tertiary butyl ether (MTBE)	50	48		1	96	70-130	12/24/2014 1009
4-Methyl-2-pentanone	100	90		1	90	60-134	12/24/2014 1009
Methylcyclohexane	50	50		1	99	41-144	12/24/2014 1009
Methylene chloride	50	47		1	93	70-130	12/24/2014 1009
Styrene	50	49		1	99	54-136	12/24/2014 1009
1,1,2,2-Tetrachloroethane	50	46		1	91	69-132	12/24/2014 1009
Tetrachloroethene	50	49		1	98	45-150	12/24/2014 1009
Toluene	50	48		1	95	61-129	12/24/2014 1009
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	52		1	103	49-136	12/24/2014 1009
1,2,4-Trichlorobenzene	50	50		1	100	34-145	12/24/2014 1009
1,1,2-Trichloroethane	50	46		1	93	55-128	12/24/2014 1009
1,1,1-Trichloroethane	50	49		1	98	63-128	12/24/2014 1009

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ63946-002
Batch: 63946
Analytical Method: 8260B

Matrix: Solid
Prep Method: 5035

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Trichloroethene	50	47		1	95	62-126	12/24/2014 1009
Trichlorofluoromethane	50	52		1	103	45-138	12/24/2014 1009
Vinyl chloride	50	53		1	106	42-132	12/24/2014 1009
Xylenes (total)	100	99		1	99	58-128	12/24/2014 1009

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		90	47-138
1,2-Dichloroethane-d4		86	53-142
Toluene-d8		93	68-124

PQL = Practical quantitation limit

ND = Not detected at or above the MDL

P = The RPD between two GC columns exceeds 40%

J = Estimated result < PQL and ≥ MDL

N = Recovery is out of criteria

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ64151-001
Batch: 64151
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/L	12/29/2014 1042
Benzene	ND		1	1.0	0.13	ug/L	12/29/2014 1042
Bromodichloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 1042
Bromoform	ND		1	1.0	0.66	ug/L	12/29/2014 1042
Bromomethane (Methyl bromide)	ND		1	2.0	0.80	ug/L	12/29/2014 1042
2-Butanone (MEK)	ND		1	10	2.0	ug/L	12/29/2014 1042
Carbon disulfide	ND		1	1.0	0.097	ug/L	12/29/2014 1042
Carbon tetrachloride	ND		1	1.0	0.14	ug/L	12/29/2014 1042
Chlorobenzene	ND		1	2.0	0.33	ug/L	12/29/2014 1042
Chloroethane	ND		1	2.0	0.47	ug/L	12/29/2014 1042
Chloroform	ND		1	1.0	0.33	ug/L	12/29/2014 1042
Chloromethane (Methyl chloride)	ND		1	1.0	0.35	ug/L	12/29/2014 1042
Dibromochloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,4-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,3-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,2-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	12/29/2014 1042
1,1-Dichloroethane	ND		1	1.0	0.13	ug/L	12/29/2014 1042
cis-1,2-Dichloroethene	ND		1	1.0	0.12	ug/L	12/29/2014 1042
trans-1,2-Dichloroethene	ND		1	1.0	0.21	ug/L	12/29/2014 1042
1,1-Dichloroethene	ND		1	1.0	0.16	ug/L	12/29/2014 1042
1,2-Dichloropropane	ND		1	1.0	0.19	ug/L	12/29/2014 1042
trans-1,3-Dichloropropene	ND		1	1.0	0.11	ug/L	12/29/2014 1042
cis-1,3-Dichloropropene	ND		1	1.0	0.092	ug/L	12/29/2014 1042
Ethylbenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
2-Hexanone	ND		1	10	0.27	ug/L	12/29/2014 1042
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	12/29/2014 1042
4-Methyl-2-pentanone	ND		1	10	0.31	ug/L	12/29/2014 1042
Methylene chloride	ND		1	1.0	0.33	ug/L	12/29/2014 1042
Styrene	ND		1	1.0	0.12	ug/L	12/29/2014 1042
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.16	ug/L	12/29/2014 1042
Tetrachloroethene	ND		1	1.0	0.13	ug/L	12/29/2014 1042
Toluene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,2,4-Trichlorobenzene	ND		1	1.0	0.51	ug/L	12/29/2014 1042
1,1,2-Trichloroethane	ND		1	1.0	0.21	ug/L	12/29/2014 1042
1,1,1-Trichloroethane	ND		1	1.0	0.074	ug/L	12/29/2014 1042
Trichloroethene	ND		1	1.0	0.18	ug/L	12/29/2014 1042
Vinyl chloride	ND		1	1.0	0.054	ug/L	12/29/2014 1042
Xylenes (total)	ND		1	1.0	0.33	ug/L	12/29/2014 1042

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		113	70-130
1,2-Dichloroethane-d4		105	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64151-002
Batch: 64151
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	95		1	95	60-140	12/29/2014 0946
Benzene	50	44		1	89	70-130	12/29/2014 0946
Bromodichloromethane	50	45		1	90	70-130	12/29/2014 0946
Bromoform	50	49		1	99	70-130	12/29/2014 0946
Bromomethane (Methyl bromide)	50	52		1	103	60-140	12/29/2014 0946
2-Butanone (MEK)	100	95		1	95	60-140	12/29/2014 0946
Carbon disulfide	50	48		1	95	60-140	12/29/2014 0946
Carbon tetrachloride	50	47		1	94	70-130	12/29/2014 0946
Chlorobenzene	50	45		1	90	70-130	12/29/2014 0946
Chloroethane	50	53		1	107	42-163	12/29/2014 0946
Chloroform	50	45		1	90	70-130	12/29/2014 0946
Chloromethane (Methyl chloride)	50	54		1	107	60-140	12/29/2014 0946
Dibromochloromethane	50	47		1	94	70-130	12/29/2014 0946
1,4-Dichlorobenzene	50	44		1	87	70-130	12/29/2014 0946
1,3-Dichlorobenzene	50	44		1	88	70-130	12/29/2014 0946
1,2-Dichlorobenzene	50	44		1	89	70-130	12/29/2014 0946
1,2-Dichloroethane	50	47		1	94	70-130	12/29/2014 0946
1,1-Dichloroethane	50	46		1	92	70-130	12/29/2014 0946
cis-1,2-Dichloroethene	50	45		1	89	70-130	12/29/2014 0946
trans-1,2-Dichloroethene	50	44		1	89	70-130	12/29/2014 0946
1,1-Dichloroethene	50	46		1	91	70-130	12/29/2014 0946
1,2-Dichloropropane	50	45		1	91	70-130	12/29/2014 0946
trans-1,3-Dichloropropene	50	47		1	94	70-130	12/29/2014 0946
cis-1,3-Dichloropropene	50	47		1	93	70-130	12/29/2014 0946
Ethylbenzene	50	46		1	93	70-130	12/29/2014 0946
2-Hexanone	100	93		1	93	60-140	12/29/2014 0946
Methyl tertiary butyl ether (MTBE)	50	46		1	93	70-130	12/29/2014 0946
4-Methyl-2-pentanone	100	95		1	95	60-140	12/29/2014 0946
Methylene chloride	50	43		1	87	70-130	12/29/2014 0946
Styrene	50	46		1	93	70-130	12/29/2014 0946
1,1,2,2-Tetrachloroethane	50	46		1	93	60-140	12/29/2014 0946
Tetrachloroethene	50	46		1	92	70-130	12/29/2014 0946
Toluene	50	44		1	89	70-130	12/29/2014 0946
1,2,4-Trichlorobenzene	50	44		1	88	70-130	12/29/2014 0946
1,1,2-Trichloroethane	50	46		1	91	70-130	12/29/2014 0946
1,1,1-Trichloroethane	50	46		1	92	70-130	12/29/2014 0946
Trichloroethene	50	45		1	90	70-130	12/29/2014 0946
Vinyl chloride	50	53		1	105	70-130	12/29/2014 0946
Xylenes (total)	100	91		1	91	70-130	12/29/2014 0946

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		106	70-130
1,2-Dichloroethane-d4		101	70-130
Toluene-d8		103	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ63919-001
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
2,4,5-Trichlorophenol	ND		1	1.0	0.18	ug/L	12/30/2014 1237
2,4,6-Trichlorophenol	ND		1	1.0	0.22	ug/L	12/30/2014 1237
2,4-Dichlorophenol	ND		1	1.0	0.15	ug/L	12/30/2014 1237
2,4-Dimethylphenol	ND		1	1.0	0.31	ug/L	12/30/2014 1237
2,4-Dinitrophenol	ND		1	5.0	0.25	ug/L	12/30/2014 1237
2,4-Dinitrotoluene	ND		1	2.0	0.45	ug/L	12/30/2014 1237
2,6-Dinitrotoluene	ND		1	2.0	0.40	ug/L	12/30/2014 1237
2-Chloronaphthalene	ND		1	1.0	0.12	ug/L	12/30/2014 1237
2-Chlorophenol	ND		1	1.0	0.13	ug/L	12/30/2014 1237
2-Methylnaphthalene	ND		1	1.0	0.080	ug/L	12/30/2014 1237
2-Methylphenol	ND		1	1.0	0.17	ug/L	12/30/2014 1237
2-Nitroaniline	ND		1	2.0	0.55	ug/L	12/30/2014 1237
2-Nitrophenol	ND		1	2.0	0.27	ug/L	12/30/2014 1237
3 & 4-Methylphenol	ND		1	2.0	0.57	ug/L	12/30/2014 1237
3,3'-Dichlorobenzidine	ND		1	5.0	0.81	ug/L	12/30/2014 1237
3-Nitroaniline	ND		1	2.0	0.77	ug/L	12/30/2014 1237
4,6-Dinitro-2-methylphenol	ND		1	5.0	1.5	ug/L	12/30/2014 1237
4-Bromophenyl phenyl ether	ND		1	1.0	0.12	ug/L	12/30/2014 1237
4-Chloro-3-methyl phenol	ND		1	1.0	0.22	ug/L	12/30/2014 1237
4-Chloroaniline	ND		1	1.0	0.13	ug/L	12/30/2014 1237
4-Chlorophenyl phenyl ether	ND		1	1.0	0.11	ug/L	12/30/2014 1237
4-Nitroaniline	ND		1	2.0	0.39	ug/L	12/30/2014 1237
4-Nitrophenol	ND		1	5.0	0.64	ug/L	12/30/2014 1237
Acenaphthene	ND		1	1.0	0.090	ug/L	12/30/2014 1237
Acenaphthylene	ND		1	1.0	0.16	ug/L	12/30/2014 1237
Anthracene	ND		1	1.0	0.13	ug/L	12/30/2014 1237
Benzo(a)anthracene	ND		1	1.0	0.15	ug/L	12/30/2014 1237
Benzo(a)pyrene	ND		1	1.0	0.16	ug/L	12/30/2014 1237
Benzo(b)fluoranthene	ND		1	1.0	0.20	ug/L	12/30/2014 1237
Benzo(g,h,i)perylene	ND		1	1.0	0.23	ug/L	12/30/2014 1237
Benzo(k)fluoranthene	ND		1	1.0	0.12	ug/L	12/30/2014 1237
bis(2-Chloroethoxy)methane	ND		1	1.0	0.13	ug/L	12/30/2014 1237
bis(2-Chloroisopropyl)ether	ND		1	1.0	0.080	ug/L	12/30/2014 1237
bis(2-Ethylhexyl)phthalate	ND		1	5.0	1.7	ug/L	12/30/2014 1237
Butyl benzyl phthalate	ND		1	5.0	1.7	ug/L	12/30/2014 1237
Carbazole	ND		1	1.0	0.25	ug/L	12/30/2014 1237
Chrysene	ND		1	1.0	0.12	ug/L	12/30/2014 1237
Di-n-butyl phthalate	ND		1	5.0	1.7	ug/L	12/30/2014 1237
Di-n-octylphthalate	ND		1	5.0	1.7	ug/L	12/30/2014 1237
Dibenzo(a,h)anthracene	ND		1	1.0	0.13	ug/L	12/30/2014 1237
Dibenzofuran	ND		1	1.0	0.16	ug/L	12/30/2014 1237
Diethylphthalate	ND		1	5.0	1.7	ug/L	12/30/2014 1237
Dimethyl phthalate	ND		1	5.0	1.7	ug/L	12/30/2014 1237
Fluoranthene	ND		1	1.0	0.21	ug/L	12/30/2014 1237

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ63919-001
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Fluorene	ND		1	1.0	0.10	ug/L	12/30/2014 1237
Hexachlorobenzene	ND		1	1.0	0.21	ug/L	12/30/2014 1237
Hexachlorobutadiene	ND		1	1.0	0.090	ug/L	12/30/2014 1237
Hexachlorocyclopentadiene	ND		1	5.0	0.23	ug/L	12/30/2014 1237
Hexachloroethane	ND		1	1.0	0.11	ug/L	12/30/2014 1237
Indeno(1,2,3-c,d)pyrene	ND		1	1.0	0.23	ug/L	12/30/2014 1237
Isophorone	ND		1	1.0	0.080	ug/L	12/30/2014 1237
N-Nitrosodi-n-propylamine	ND		1	1.0	0.080	ug/L	12/30/2014 1237
N-Nitrosodiphenylamine (Diphenylamine)	ND		1	1.0	0.38	ug/L	12/30/2014 1237
Naphthalene	ND		1	1.0	0.070	ug/L	12/30/2014 1237
Nitrobenzene	ND		1	1.0	0.10	ug/L	12/30/2014 1237
Pentachlorophenol	ND		1	5.0	0.54	ug/L	12/30/2014 1237
Phenanthrene	ND		1	1.0	0.18	ug/L	12/30/2014 1237
Phenol	ND		1	1.0	0.11	ug/L	12/30/2014 1237
Pyrene	ND		1	1.0	0.16	ug/L	12/30/2014 1237

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		62	41-144
2-Fluorobiphenyl		71	37-129
2-Fluorophenol		71	24-127
Nitrobenzene-d5		70	38-127
Phenol-d5		72	28-128
Terphenyl-d14		80	10-148

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ63919-002
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
2,4,5-Trichlorophenol	20	16		1	80	46-125	12/30/2014 1300
2,4,6-Trichlorophenol	20	17		1	83	36-123	12/30/2014 1300
2,4-Dichlorophenol	20	16		1	82	38-127	12/30/2014 1300
2,4-Dimethylphenol	20	24	N	1	118	36-110	12/30/2014 1300
2,4-Dinitrophenol	100	83		1	83	33-143	12/30/2014 1300
2,4-Dinitrotoluene	40	35		1	87	55-137	12/30/2014 1300
2,6-Dinitrotoluene	40	34		1	86	53-128	12/30/2014 1300
2-Chloronaphthalene	20	14		1	71	42-132	12/30/2014 1300
2-Chlorophenol	20	17		1	83	40-128	12/30/2014 1300
2-Methylnaphthalene	20	17		1	84	40-132	12/30/2014 1300
2-Methylphenol	20	17		1	84	33-122	12/30/2014 1300
2-Nitroaniline	40	34		1	85	48-126	12/30/2014 1300
2-Nitrophenol	40	33		1	81	44-131	12/30/2014 1300
3 & 4-Methylphenol	40	35		1	88	48-112	12/30/2014 1300
3-Nitroaniline	40	29		1	73	29-109	12/30/2014 1300
4,6-Dinitro-2-methylphenol	100	88		1	88	46-151	12/30/2014 1300
4-Bromophenyl phenyl ether	20	15		1	76	49-123	12/30/2014 1300
4-Chloro-3-methyl phenol	20	17		1	86	48-136	12/30/2014 1300
4-Chloroaniline	20	18	N	1	89	18-73	12/30/2014 1300
4-Chlorophenyl phenyl ether	20	16		1	80	34-124	12/30/2014 1300
4-Nitroaniline	40	37		1	91	42-154	12/30/2014 1300
4-Nitrophenol	100	87		1	87	43-145	12/30/2014 1300
Acenaphthene	20	17		1	84	51-130	12/30/2014 1300
Acenaphthylene	20	20		1	102	46-131	12/30/2014 1300
Anthracene	20	17		1	87	48-122	12/30/2014 1300
Benzo(a)anthracene	20	16		1	80	50-143	12/30/2014 1300
Benzo(a)pyrene	20	16		1	80	55-141	12/30/2014 1300
Benzo(b)fluoranthene	20	17		1	85	48-147	12/30/2014 1300
Benzo(g,h,i)perylene	20	16		1	80	48-139	12/30/2014 1300
Benzo(k)fluoranthene	20	18		1	90	48-148	12/30/2014 1300
bis(2-Chloroethoxy)methane	20	16		1	82	46-130	12/30/2014 1300
bis(2-Chloroisopropyl)ether	20	17		1	85	36-133	12/30/2014 1300
bis(2-Ethylhexyl)phthalate	20	15		1	73	40-141	12/30/2014 1300
Butyl benzyl phthalate	20	17		1	86	52-142	12/30/2014 1300
Carbazole	20	18		1	89	45-101	12/30/2014 1300
Chrysene	20	17		1	83	51-137	12/30/2014 1300
Di-n-butyl phthalate	20	16		1	81	50-134	12/30/2014 1300
Di-n-octylphthalate	20	14		1	72	50-136	12/30/2014 1300
Dibenzo(a,h)anthracene	20	16		1	80	48-139	12/30/2014 1300
Dibenzofuran	20	16		1	82	45-142	12/30/2014 1300
Diethylphthalate	20	17		1	87	48-124	12/30/2014 1300
Dimethyl phthalate	20	17		1	85	43-122	12/30/2014 1300
Fluoranthene	20	16		1	82	50-124	12/30/2014 1300
Fluorene	20	18		1	88	39-122	12/30/2014 1300

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ63919-002
Batch: 63919
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 938

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexachlorobenzene	20	18		1	91	46-125	12/30/2014 1300
Hexachlorobutadiene	20	15		1	76	38-121	12/30/2014 1300
Hexachlorocyclopentadiene	100	59		1	59	24-110	12/30/2014 1300
Hexachloroethane	20	15		1	77	32-109	12/30/2014 1300
Indeno(1,2,3-c,d)pyrene	20	16		1	78	49-146	12/30/2014 1300
Isophorone	20	17		1	86	43-118	12/30/2014 1300
N-Nitrosodi-n-propylamine	20	17		1	87	46-135	12/30/2014 1300
N-Nitrosodiphenylamine (Diphenylamine)	20	20		1	98	44-124	12/30/2014 1300
Naphthalene	20	16		1	81	45-118	12/30/2014 1300
Nitrobenzene	20	16		1	81	46-131	12/30/2014 1300
Pentachlorophenol	100	71		1	71	30-137	12/30/2014 1300
Phenanthrene	20	17		1	83	49-122	12/30/2014 1300
Phenol	20	16		1	82	35-118	12/30/2014 1300
Pyrene	20	16		1	79	50-130	12/30/2014 1300

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		84	41-144
2-Fluorobiphenyl		80	37-129
2-Fluorophenol		74	24-127
Nitrobenzene-d5		83	38-127
Phenol-d5		80	28-128
Terphenyl-d14		88	10-148

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ64207-001
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
1,1'-Biphenyl	ND		1	33	10	ug/kg	12/30/2014 1150
2,4,5-Trichlorophenol	ND		1	33	9.3	ug/kg	12/30/2014 1150
2,4,6-Trichlorophenol	ND		1	33	9.8	ug/kg	12/30/2014 1150
2,4-Dichlorophenol	ND		1	33	10	ug/kg	12/30/2014 1150
2,4-Dimethylphenol	ND		1	33	12	ug/kg	12/30/2014 1150
2,4-Dinitrophenol	ND		1	170	110	ug/kg	12/30/2014 1150
2,4-Dinitrotoluene	ND		1	67	18	ug/kg	12/30/2014 1150
2,6-Dinitrotoluene	ND		1	67	17	ug/kg	12/30/2014 1150
2-Chloronaphthalene	ND		1	33	11	ug/kg	12/30/2014 1150
2-Chlorophenol	ND		1	33	9.2	ug/kg	12/30/2014 1150
2-Methylnaphthalene	ND		1	33	9.9	ug/kg	12/30/2014 1150
2-Methylphenol	ND		1	33	6.0	ug/kg	12/30/2014 1150
2-Nitroaniline	ND		1	67	23	ug/kg	12/30/2014 1150
2-Nitrophenol	ND		1	67	18	ug/kg	12/30/2014 1150
3 & 4-Methylphenol	ND		1	67	12	ug/kg	12/30/2014 1150
3,3'-Dichlorobenzidine	ND		1	170	36	ug/kg	12/30/2014 1150
3-Nitroaniline	ND		1	67	39	ug/kg	12/30/2014 1150
4,6-Dinitro-2-methylphenol	ND		1	170	130	ug/kg	12/30/2014 1150
4-Bromophenyl phenyl ether	ND		1	33	9.8	ug/kg	12/30/2014 1150
4-Chloro-3-methyl phenol	ND		1	33	8.4	ug/kg	12/30/2014 1150
4-Chloroaniline	ND		1	33	6.8	ug/kg	12/30/2014 1150
4-Chlorophenyl phenyl ether	ND		1	33	11	ug/kg	12/30/2014 1150
4-Nitroaniline	ND		1	67	19	ug/kg	12/30/2014 1150
4-Nitrophenol	ND		1	170	96	ug/kg	12/30/2014 1150
Acenaphthene	ND		1	33	11	ug/kg	12/30/2014 1150
Acenaphthylene	ND		1	33	10	ug/kg	12/30/2014 1150
Acetophenone	ND		1	33	18	ug/kg	12/30/2014 1150
Anthracene	ND		1	33	7.4	ug/kg	12/30/2014 1150
Atrazine	ND		1	33	17	ug/kg	12/30/2014 1150
Benzaldehyde	ND		1	33	17	ug/kg	12/30/2014 1150
Benzo(a)anthracene	ND		1	33	8.8	ug/kg	12/30/2014 1150
Benzo(a)pyrene	ND		1	33	9.3	ug/kg	12/30/2014 1150
Benzo(b)fluoranthene	ND		1	33	9.6	ug/kg	12/30/2014 1150
Benzo(g,h,i)perylene	ND		1	33	12	ug/kg	12/30/2014 1150
Benzo(k)fluoranthene	ND		1	33	9.5	ug/kg	12/30/2014 1150
bis(2-Chloroethoxy)methane	ND		1	33	10	ug/kg	12/30/2014 1150
bis(2-Chloroethyl)ether	ND		1	33	9.2	ug/kg	12/30/2014 1150
bis(2-Chloroisopropyl)ether	ND		1	33	11	ug/kg	12/30/2014 1150
bis(2-Ethylhexyl)phthalate	ND		1	33	12	ug/kg	12/30/2014 1150
Butyl benzyl phthalate	ND		1	67	22	ug/kg	12/30/2014 1150
Caprolactam	ND		1	33	17	ug/kg	12/30/2014 1150
Carbazole	ND		1	33	14	ug/kg	12/30/2014 1150
Chrysene	ND		1	33	11	ug/kg	12/30/2014 1150
Di-n-butyl phthalate	ND		1	33	18	ug/kg	12/30/2014 1150

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ64207-001
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Di-n-octylphthalate	ND		1	33	32	ug/kg	12/30/2014 1150
Dibenzo(a,h)anthracene	ND		1	33	9.1	ug/kg	12/30/2014 1150
Dibenzofuran	ND		1	33	10	ug/kg	12/30/2014 1150
Diethylphthalate	ND		1	33	11	ug/kg	12/30/2014 1150
Dimethyl phthalate	ND		1	33	11	ug/kg	12/30/2014 1150
Fluoranthene	ND		1	33	11	ug/kg	12/30/2014 1150
Fluorene	ND		1	33	9.0	ug/kg	12/30/2014 1150
Hexachlorobenzene	ND		1	33	15	ug/kg	12/30/2014 1150
Hexachlorobutadiene	ND		1	33	11	ug/kg	12/30/2014 1150
Hexachlorocyclopentadiene	ND		1	170	25	ug/kg	12/30/2014 1150
Hexachloroethane	ND		1	33	8.9	ug/kg	12/30/2014 1150
Indeno(1,2,3-c,d)pyrene	ND		1	33	9.7	ug/kg	12/30/2014 1150
Isophorone	ND		1	33	7.4	ug/kg	12/30/2014 1150
N-Nitrosodi-n-propylamine	ND		1	33	13	ug/kg	12/30/2014 1150
N-Nitrosodiphenylamine (Diphenylamine)	ND		1	33	8.3	ug/kg	12/30/2014 1150
Naphthalene	ND		1	33	10	ug/kg	12/30/2014 1150
Nitrobenzene	ND		1	33	5.4	ug/kg	12/30/2014 1150
Pentachlorophenol	ND		1	170	140	ug/kg	12/30/2014 1150
Phenanthrene	ND		1	33	9.0	ug/kg	12/30/2014 1150
Phenol	ND		1	33	9.1	ug/kg	12/30/2014 1150
Pyrene	ND		1	33	13	ug/kg	12/30/2014 1150

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		42	30-117
2-Fluorobiphenyl		40	33-102
2-Fluorophenol		44	28-104
Nitrobenzene-d5		39	22-109
Phenol-d5		47	27-103
Terphenyl-d14		73	41-120

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64207-002
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
1,1'-Biphenyl	670	300		1	45	30-130	12/30/2014 1213
2,4,5-Trichlorophenol	670	400		1	60	46-122	12/30/2014 1213
2,4,6-Trichlorophenol	670	380		1	57	38-115	12/30/2014 1213
2,4-Dichlorophenol	670	320		1	48	41-113	12/30/2014 1213
2,4-Dimethylphenol	670	490		1	74	33-123	12/30/2014 1213
2,4-Dinitrophenol	3300	2300		1	70	30-130	12/30/2014 1213
2,4-Dinitrotoluene	1300	1000		1	75	48-124	12/30/2014 1213
2,6-Dinitrotoluene	1300	880		1	66	47-125	12/30/2014 1213
2-Chloronaphthalene	670	280		1	42	31-127	12/30/2014 1213
2-Chlorophenol	670	300		1	45	37-106	12/30/2014 1213
2-Methylnaphthalene	670	300		1	46	40-106	12/30/2014 1213
2-Methylphenol	670	310		1	47	32-107	12/30/2014 1213
2-Nitroaniline	1300	870		1	66	45-128	12/30/2014 1213
2-Nitrophenol	1300	550		1	41	35-108	12/30/2014 1213
3 & 4-Methylphenol	1300	670		1	50	39-108	12/30/2014 1213
3,3'-Dichlorobenzidine	1300	1000		1	76	30-130	12/30/2014 1213
3-Nitroaniline	1300	870		1	65	24-127	12/30/2014 1213
4,6-Dinitro-2-methylphenol	3300	2600		1	78	40-130	12/30/2014 1213
4-Bromophenyl phenyl ether	670	390		1	59	46-118	12/30/2014 1213
4-Chloro-3-methyl phenol	670	410		1	62	49-118	12/30/2014 1213
4-Chloroaniline	670	370		1	55	10-125	12/30/2014 1213
4-Chlorophenyl phenyl ether	670	380		1	57	47-116	12/30/2014 1213
4-Nitroaniline	1300	1100		1	86	48-127	12/30/2014 1213
4-Nitrophenol	3300	2800		1	84	18-154	12/30/2014 1213
Acenaphthene	670	360		1	54	46-114	12/30/2014 1213
Acenaphthylene	670	450		1	68	44-122	12/30/2014 1213
Acetophenone	670	280		1	42	30-130	12/30/2014 1213
Anthracene	670	500		1	76	50-119	12/30/2014 1213
Atrazine	670	450		1	67	30-130	12/30/2014 1213
Benzaldehyde	670	280		1	42	40-117	12/30/2014 1213
Benzo(a)anthracene	670	540		1	80	47-121	12/30/2014 1213
Benzo(a)pyrene	670	590		1	89	55-134	12/30/2014 1213
Benzo(b)fluoranthene	670	570		1	85	28-139	12/30/2014 1213
Benzo(g,h,i)perylene	670	540		1	81	36-125	12/30/2014 1213
Benzo(k)fluoranthene	670	590		1	89	47-130	12/30/2014 1213
bis(2-Chloroethoxy)methane	670	290		1	44	39-108	12/30/2014 1213
bis(2-Chloroethyl)ether	670	280		1	42	32-105	12/30/2014 1213
bis(2-Chloroisopropyl)ether	670	280		1	43	31-102	12/30/2014 1213
bis(2-Ethylhexyl)phthalate	670	570		1	85	45-128	12/30/2014 1213
Butyl benzyl phthalate	670	570		1	86	46-128	12/30/2014 1213
Caprolactam	670	650		1	98	30-130	12/30/2014 1213
Carbazole	670	570		1	86	30-130	12/30/2014 1213
Chrysene	670	550		1	82	45-126	12/30/2014 1213
Di-n-butyl phthalate	670	550		1	82	51-129	12/30/2014 1213

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64207-002
Batch: 64207
Analytical Method: 8270D

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 2057

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Di-n-octylphthalate	670	550		1	82	49-142	12/30/2014 1213
Dibenzo(a,h)anthracene	670	540		1	81	30-130	12/30/2014 1213
Dibenzofuran	670	370		1	56	45-112	12/30/2014 1213
Diethylphthalate	670	500		1	75	49-123	12/30/2014 1213
Dimethyl phthalate	670	460		1	69	48-120	12/30/2014 1213
Fluoranthene	670	540		1	80	50-123	12/30/2014 1213
Fluorene	670	420		1	63	48-117	12/30/2014 1213
Hexachlorobenzene	670	490		1	73	44-122	12/30/2014 1213
Hexachlorobutadiene	670	250		1	37	33-103	12/30/2014 1213
Hexachlorocyclopentadiene	3300	1300		1	39	18-121	12/30/2014 1213
Hexachloroethane	670	240		1	36	30-96	12/30/2014 1213
Indeno(1,2,3-c,d)pyrene	670	530		1	80	45-123	12/30/2014 1213
Isophorone	670	330		1	49	30-130	12/30/2014 1213
N-Nitrosodi-n-propylamine	670	310		1	46	32-115	12/30/2014 1213
N-Nitrosodiphenylamine (Diphenylamine)	670	570		1	86	53-150	12/30/2014 1213
Naphthalene	670	270		1	41	36-110	12/30/2014 1213
Nitrobenzene	670	280		1	42	33-114	12/30/2014 1213
Pentachlorophenol	3300	2200		1	65	27-138	12/30/2014 1213
Phenanthrene	670	470		1	71	49-117	12/30/2014 1213
Phenol	670	320		1	48	36-108	12/30/2014 1213
Pyrene	670	530		1	79	47-119	12/30/2014 1213

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		69	30-117
2-Fluorobiphenyl		46	33-102
2-Fluorophenol		42	28-104
Nitrobenzene-d5		41	22-109
Phenol-d5		46	27-103
Terphenyl-d14		85	41-120

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MB

Sample ID: PQ63984-001
Batch: 63984
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 1857

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
4,4'-DDD	ND		1	0.025	0.0010	ug/L	12/29/2014 1130
4,4'-DDE	ND		1	0.025	0.011	ug/L	12/29/2014 1130
4,4'-DDT	ND		1	0.025	0.0020	ug/L	12/29/2014 1130
Aldrin	ND		1	0.025	0.0017	ug/L	12/29/2014 1130
alpha-BHC	ND		1	0.025	0.0010	ug/L	12/29/2014 1130
alpha-Chlordane	ND		1	0.025	0.0013	ug/L	12/29/2014 1130
beta-BHC	ND		1	0.025	0.0039	ug/L	12/29/2014 1130
delta-BHC	ND		1	0.025	0.0011	ug/L	12/29/2014 1130
Dieldrin	ND		1	0.025	0.0010	ug/L	12/29/2014 1130
Endosulfan I	ND		1	0.025	0.0022	ug/L	12/29/2014 1130
Endosulfan II	ND		1	0.025	0.0015	ug/L	12/29/2014 1130
Endosulfan sulfate	ND		1	0.025	0.0011	ug/L	12/29/2014 1130
Endrin	ND		1	0.025	0.0010	ug/L	12/29/2014 1130
Endrin aldehyde	ND		1	0.025	0.0019	ug/L	12/29/2014 1130
Endrin ketone	ND		1	0.025	0.0012	ug/L	12/29/2014 1130
gamma-BHC (Lindane)	ND		1	0.025	0.0011	ug/L	12/29/2014 1130
gamma-Chlordane	ND		1	0.025	0.0015	ug/L	12/29/2014 1130
Heptachlor	ND		1	0.025	0.013	ug/L	12/29/2014 1130
Heptachlor epoxide	ND		1	0.025	0.0020	ug/L	12/29/2014 1130
Methoxychlor	ND		1	0.10	0.0020	ug/L	12/29/2014 1130
Toxaphene	ND		1	0.25	0.11	ug/L	12/29/2014 1130

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		40	10-122
Tetrachloro-m-xylene		84	46-119

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - LCS

Sample ID: PQ63984-002
Batch: 63984
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/24/2014 1857

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
4,4'-DDD	0.50	0.47		1	93	70-130	12/29/2014 1145
4,4'-DDE	0.50	0.45		1	90	70-130	12/29/2014 1145
4,4'-DDT	0.50	0.51		1	103	70-130	12/29/2014 1145
Aldrin	0.50	0.44		1	88	70-130	12/29/2014 1145
alpha-BHC	0.50	0.41		1	81	70-130	12/29/2014 1145
alpha-Chlordane	0.50	0.44		1	88	70-130	12/29/2014 1145
beta-BHC	0.50	0.43		1	87	70-130	12/29/2014 1145
delta-BHC	0.50	0.39		1	78	70-130	12/29/2014 1145
Dieldrin	0.50	0.46		1	92	70-130	12/29/2014 1145
Endosulfan I	0.50	0.45		1	89	70-130	12/29/2014 1145
Endosulfan II	0.50	0.44		1	89	70-130	12/29/2014 1145
Endosulfan sulfate	0.50	0.42		1	84	70-130	12/29/2014 1145
Endrin	0.50	0.19	N	1	37	70-130	12/29/2014 1145
Endrin aldehyde	0.50	0.46		1	92	70-130	12/29/2014 1145
Endrin ketone	0.50	0.67	N	1	134	70-130	12/29/2014 1145
gamma-BHC (Lindane)	0.50	0.43		1	86	70-130	12/29/2014 1145
gamma-Chlordane	0.50	0.44		1	89	70-130	12/29/2014 1145
Heptachlor	0.50	0.40		1	80	70-130	12/29/2014 1145
Heptachlor epoxide	0.50	0.44		1	87	70-130	12/29/2014 1145
Methoxychlor	0.50	0.55		1	111	70-130	12/29/2014 1145

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		82	10-122
Tetrachloro-m-xylene		81	46-119

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MB

Sample ID: PQ64120-001
Batch: 64120
Analytical Method: 8081B

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 930

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
4,4'-DDD	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
4,4'-DDE	ND		1	1.7	0.32	ug/kg	01/07/2015 1043
4,4'-DDT	ND		1	1.7	0.070	ug/kg	01/07/2015 1043
Aldrin	ND		1	1.7	0.042	ug/kg	01/07/2015 1043
alpha-BHC	ND		1	1.7	0.045	ug/kg	01/07/2015 1043
alpha-Chlordane	ND		1	1.7	0.028	ug/kg	01/07/2015 1043
beta-BHC	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
delta-BHC	ND		1	1.7	0.021	ug/kg	01/07/2015 1043
Dieldrin	ND		1	1.7	0.028	ug/kg	01/07/2015 1043
Endosulfan I	ND		1	1.7	0.041	ug/kg	01/07/2015 1043
Endosulfan II	ND		1	1.7	0.032	ug/kg	01/07/2015 1043
Endosulfan sulfate	ND		1	1.7	0.037	ug/kg	01/07/2015 1043
Endrin	ND		1	1.7	0.022	ug/kg	01/07/2015 1043
Endrin aldehyde	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
Endrin ketone	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
gamma-BHC (Lindane)	ND		1	1.7	0.075	ug/kg	01/07/2015 1043
gamma-Chlordane	ND		1	1.7	0.025	ug/kg	01/07/2015 1043
Heptachlor	ND		1	1.7	0.057	ug/kg	01/07/2015 1043
Heptachlor epoxide	ND		1	1.7	0.036	ug/kg	01/07/2015 1043
Methoxychlor	ND		1	6.7	0.067	ug/kg	01/07/2015 1043
Toxaphene	ND		1	83	1.7	ug/kg	01/07/2015 1043

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		75	57-110
Tetrachloro-m-xylene		60	37-91

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - LCS

Sample ID: PQ64120-002
Batch: 64120
Analytical Method: 8081B

Matrix: Solid
Prep Method: 3550C
Prep Date: 12/29/2014 930

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
4,4'-DDD	17	15		1	91	70-130	01/07/2015 1057
4,4'-DDE	17	15		1	89	70-130	01/07/2015 1057
4,4'-DDT	17	15		1	87	70-130	01/07/2015 1057
Aldrin	17	15		1	87	70-130	01/07/2015 1057
alpha-BHC	17	14		1	80	70-130	01/07/2015 1057
alpha-Chlordane	17	15		1	88	70-130	01/07/2015 1057
beta-BHC	17	13		1	79	70-130	01/07/2015 1057
delta-BHC	17	14		1	82	70-130	01/07/2015 1057
Dieldrin	17	16		1	92	70-130	01/07/2015 1057
Endosulfan I	17	15		1	88	70-130	01/07/2015 1057
Endosulfan II	17	15		1	90	70-130	01/07/2015 1057
Endosulfan sulfate	17	14		1	84	70-130	01/07/2015 1057
Endrin	17	15		1	90	70-130	01/07/2015 1057
Endrin aldehyde	17	14		1	81	70-130	01/07/2015 1057
Endrin ketone	17	15		1	87	70-130	01/07/2015 1057
gamma-BHC (Lindane)	17	14		1	84	70-130	01/07/2015 1057
gamma-Chlordane	17	15		1	86	70-130	01/07/2015 1057
Heptachlor	17	14		1	80	70-130	01/07/2015 1057
Heptachlor epoxide	17	14		1	85	70-130	01/07/2015 1057
Methoxychlor	17	15		1	88	70-130	01/07/2015 1057

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		75	57-110
Tetrachloro-m-xylene		60	37-91

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MB

Sample ID: PQ64252-001
Batch: 64252
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/30/2014 1824

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
4,4'-DDD	ND		1	0.025	0.0010	ug/L	01/05/2015 2145
4,4'-DDE	ND		1	0.025	0.011	ug/L	01/05/2015 2145
4,4'-DDT	ND		1	0.025	0.0020	ug/L	01/05/2015 2145
Aldrin	ND		1	0.025	0.0017	ug/L	01/05/2015 2145
alpha-BHC	ND		1	0.025	0.0010	ug/L	01/05/2015 2145
alpha-Chlordane	ND		1	0.025	0.0013	ug/L	01/05/2015 2145
beta-BHC	ND		1	0.025	0.0039	ug/L	01/05/2015 2145
delta-BHC	0.0062	J	1	0.025	0.0011	ug/L	01/05/2015 2145
Dieldrin	0.0015	J	1	0.025	0.0010	ug/L	01/05/2015 2145
Endosulfan I	ND		1	0.025	0.0022	ug/L	01/05/2015 2145
Endosulfan II	ND		1	0.025	0.0015	ug/L	01/05/2015 2145
Endosulfan sulfate	ND		1	0.025	0.0011	ug/L	01/05/2015 2145
Endrin	ND		1	0.025	0.0010	ug/L	01/05/2015 2145
Endrin aldehyde	0.049		1	0.025	0.0019	ug/L	01/05/2015 2145
Endrin ketone	ND		1	0.025	0.0012	ug/L	01/05/2015 2145
gamma-BHC (Lindane)	0.0024	J	1	0.025	0.0011	ug/L	01/05/2015 2145
gamma-Chlordane	ND		1	0.025	0.0015	ug/L	01/05/2015 2145
Heptachlor	ND		1	0.025	0.013	ug/L	01/05/2015 2145
Heptachlor epoxide	0.0020	J	1	0.025	0.0020	ug/L	01/05/2015 2145
Methoxychlor	ND		1	0.10	0.0020	ug/L	01/05/2015 2145
Toxaphene	ND		1	0.25	0.11	ug/L	01/05/2015 2145

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		78	10-122
Tetrachloro-m-xylene		70	46-119

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - LCS

Sample ID: PQ64252-002
Batch: 64252
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/30/2014 1824

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
4,4'-DDD	0.50	0.52		1	103	70-130	01/05/2015 2159
4,4'-DDE	0.50	0.51		1	101	70-130	01/05/2015 2159
4,4'-DDT	0.50	0.50		1	101	70-130	01/05/2015 2159
Aldrin	0.50	0.49		1	98	70-130	01/05/2015 2159
alpha-BHC	0.50	0.47		1	95	70-130	01/05/2015 2159
alpha-Chlordane	0.50	0.49		1	99	70-130	01/05/2015 2159
beta-BHC	0.50	0.45		1	91	70-130	01/05/2015 2159
delta-BHC	0.50	0.52		1	103	70-130	01/05/2015 2159
Dieldrin	0.50	0.52		1	105	70-130	01/05/2015 2159
Endosulfan I	0.50	0.50		1	100	70-130	01/05/2015 2159
Endosulfan II	0.50	0.52		1	105	70-130	01/05/2015 2159
Endosulfan sulfate	0.50	0.50		1	100	70-130	01/05/2015 2159
Endrin	0.50	0.50		1	101	70-130	01/05/2015 2159
Endrin aldehyde	0.50	0.51		1	102	70-130	01/05/2015 2159
Endrin ketone	0.50	0.54		1	107	70-130	01/05/2015 2159
gamma-BHC (Lindane)	0.50	0.49		1	98	70-130	01/05/2015 2159
gamma-Chlordane	0.50	0.49		1	98	70-130	01/05/2015 2159
Heptachlor	0.50	0.46		1	92	70-130	01/05/2015 2159
Heptachlor epoxide	0.50	0.49		1	98	70-130	01/05/2015 2159
Methoxychlor	0.50	0.50		1	100	70-130	01/05/2015 2159

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		77	10-122
Tetrachloro-m-xylene		68	46-119

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MS

Sample ID: PL19009-001MS
Batch: 64252
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/30/2014 1824

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Aldrin	ND	1.0	0.91		1	91	70-130	01/06/2015 1400
gamma-BHC (Lindane)	ND	1.0	0.91		1	91	70-130	01/06/2015 1400
alpha-BHC	ND	1.0	0.86		1	86	70-130	01/06/2015 1400
beta-BHC	ND	1.0	0.90		1	90	70-130	01/06/2015 1400
delta-BHC	ND	1.0	1.0		1	102	70-130	01/06/2015 1400
alpha-Chlordane	ND	1.0	0.94		1	94	70-130	01/06/2015 1400
gamma-Chlordane	ND	1.0	0.95		1	95	70-130	01/06/2015 1400
4,4'-DDD	ND	1.0	0.99		1	99	70-130	01/06/2015 1400
4,4'-DDE	ND	1.0	0.94		1	94	70-130	01/06/2015 1400
4,4'-DDT	ND	1.0	1.0		1	101	70-130	01/06/2015 1400
Dieldrin	ND	1.0	1.0		1	101	70-130	01/06/2015 1400
Endosulfan I	ND	1.0	0.95		1	95	70-130	01/06/2015 1400
Endosulfan II	ND	1.0	0.99		1	99	70-130	01/06/2015 1400
Endosulfan sulfate	ND	1.0	1.0		1	100	70-130	01/06/2015 1400
Endrin	ND	1.0	0.98		1	98	70-130	01/06/2015 1400
Endrin aldehyde	ND	1.0	1.0		1	99	70-130	01/06/2015 1400
Endrin ketone	ND	1.0	1.1		1	112	70-130	01/06/2015 1400
Heptachlor	ND	1.0	0.83		1	83	70-130	01/06/2015 1400
Heptachlor epoxide	ND	1.0	0.94		1	94	70-130	01/06/2015 1400
Methoxychlor	0.070	1.0	1.0		1	103	70-130	01/06/2015 1400

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		61	10-122
Tetrachloro-m-xylene		64	46-119

PQL = Practical quantitation limit

ND = Not detected at or above the MDL

P = The RPD between two GC columns exceeds 40%

J = Estimated result < PQL and ≥ MDL

N = Recovery is out of criteria

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MSD

Sample ID: PL19009-001MD
Batch: 64252
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/30/2014 1824

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Aldrin	ND	1.0	0.82		1	82	10	70-130	30	01/06/2015 1414
gamma-BHC (Lindane)	ND	1.0	0.88		1	88	3.6	70-130	30	01/06/2015 1414
alpha-BHC	ND	1.0	0.85		1	85	1.9	70-130	30	01/06/2015 1414
beta-BHC	ND	1.0	0.87		1	87	2.3	70-130	30	01/06/2015 1414
delta-BHC	ND	1.0	0.97		1	97	4.6	70-130	30	01/06/2015 1414
alpha-Chlordane	ND	1.0	0.84		1	84	11	70-130	30	01/06/2015 1414
gamma-Chlordane	ND	1.0	0.82		1	82	15	70-130	30	01/06/2015 1414
4,4'-DDD	ND	1.0	0.87		1	87	12	70-130	30	01/06/2015 1414
4,4'-DDE	ND	1.0	0.89		1	89	5.7	70-130	30	01/06/2015 1414
4,4'-DDT	ND	1.0	0.88		1	88	13	70-130	30	01/06/2015 1414
Dieldrin	ND	1.0	0.92		1	92	9.9	70-130	30	01/06/2015 1414
Endosulfan I	ND	1.0	0.78		1	78	19	70-130	30	01/06/2015 1414
Endosulfan II	ND	1.0	0.92		1	92	7.7	70-130	30	01/06/2015 1414
Endosulfan sulfate	ND	1.0	0.93		1	93	8.1	70-130	30	01/06/2015 1414
Endrin	ND	1.0	0.90		1	90	8.1	70-130	30	01/06/2015 1414
Endrin aldehyde	ND	1.0	0.95		1	95	5.0	70-130	30	01/06/2015 1414
Endrin ketone	ND	1.0	1.1		1	105	6.7	70-130	30	01/06/2015 1414
Heptachlor	ND	1.0	0.76		1	76	8.6	70-130	30	01/06/2015 1414
Heptachlor epoxide	ND	1.0	0.87		1	87	8.3	70-130	30	01/06/2015 1414
Methoxychlor	0.070	1.0	0.94		1	93	10	70-130	30	01/06/2015 1414

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		56	10-122
Tetrachloro-m-xylene		61	46-119

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ63996-001
Batch: 63996
Analytical Method: 6010C
Matrix: Solid
Prep Method: 3050B
Prep Date: 12/29/2014 1651

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Arsenic	ND		1	0.50	0.19	mg/kg	12/31/2014 1356
Barium	ND		1	1.3	0.091	mg/kg	12/31/2014 1356
Cadmium	0.018	J	1	0.10	0.011	mg/kg	12/31/2014 1356
Chromium	ND		1	0.25	0.051	mg/kg	12/31/2014 1356
Lead	0.11	J	1	0.50	0.093	mg/kg	12/31/2014 1356
Selenium	ND		1	0.50	0.17	mg/kg	12/31/2014 1356
Silver	ND		1	0.25	0.042	mg/kg	12/31/2014 1356

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ63996-002
Batch: 63996
Analytical Method: 6010C
Matrix: Solid
Prep Method: 3050B
Prep Date: 12/29/2014 1651

Parameter	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	240	240		1	99	80-120	12/31/2014 1400
Barium	480	480		1	99	80-120	12/31/2014 1400
Cadmium	48	48		1	99	80-120	12/31/2014 1400
Chromium	240	230		1	96	80-120	12/31/2014 1400
Lead	240	250		1	102	80-120	12/31/2014 1400
Selenium	48	49		1	101	80-120	12/31/2014 1400
Silver	240	240		1	98	80-120	12/31/2014 1400

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MB

Sample ID: QQ64841-001
Batch: 64841
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 01/08/2015 1415

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Arsenic	ND		1	1.0	0.26	ug/L	01/09/2015 0207
Barium	0.29	J	1	5.0	0.045	ug/L	01/09/2015 0207
Cadmium	ND		1	0.10	0.059	ug/L	01/09/2015 0207
Chromium	ND		1	5.0	0.35	ug/L	01/09/2015 0207
Lead	ND		1	1.0	0.047	ug/L	01/09/2015 0207
Selenium	ND		1	1.0	0.25	ug/L	01/09/2015 0207
Silver	ND		1	1.0	0.011	ug/L	01/09/2015 1743

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - LCS

Sample ID: QQ64841-002
Batch: 64841
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 01/08/2015 1415

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	100	100		1	101	80-120	01/09/2015 0212
Barium	100	100		1	105	80-120	01/09/2015 0212
Cadmium	100	100		1	101	80-120	01/09/2015 0212
Chromium	100	98		1	98	80-120	01/09/2015 0212
Lead	100	100		1	101	80-120	01/09/2015 0212
Selenium	100	100		1	100	80-120	01/09/2015 0212
Silver	100	110		1	109	80-120	01/09/2015 1748

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ64167-001
Batch: 64167
Analytical Method: 7471B

Matrix: Solid
Prep Method: 7471B
Prep Date: 12/30/2014 1244

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	0.0092	J	1	0.083	0.0059	mg/kg	12/31/2014 1217

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ64167-002
Batch: 64167
Analytical Method: 7471B
Matrix: Solid
Prep Method: 7471B
Prep Date: 12/30/2014 1244

Parameter	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.78	0.83		1	107	80-120	12/31/2014 1219

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

CVAA - MB

Sample ID: PQ64180-001
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	ND		1	0.00010	0.000015	mg/L	12/29/2014 1752

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

CVAA - LCS

Sample ID: PQ64180-002
Batch: 64180
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/29/2014 1445

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.0020	0.0019		1	94	85-115	12/29/2014 1753

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

28541
Page 1 of 1

Courier: Fedex
Airbill No.:
Sampling Complete?

PL19009

RI - Rinse
WP - Wipe
O - Other

Client/Reporting Information	Project Information
Company Name: ARCADIS	Project Name: HAA-01
Address: 801 Corporate Center Dr. #300	Sampling Location: Savannah, GA
City: Raleigh State: NC Zip: 27607	Turnaround Time: Standard
Project Contact: Scott Bostian	Batch QC or Project Specific? If Specific, which Sample ID?
Phone #: 919-854-1282	Are aqueous samples field filtered for metals? Y or N
Sampler's Name: Jared Fino / Danny Mays	Are high concentrations expected? Y or N? If yes, which ID(s)?

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	Number of Preserved Bottles: HCl	NaOH	HNO3	H2SO4	MEOH	Other None	Requested Analysis: VOC	SVOC	RCRA 8 Metals	Hex. Chrome	OC Pesticides	pH / Sample Info (Lab Use)
	HA01SW06(121814)	12/18/14	0831	SW	9	3		1			5	X	X	X	X	X	
	HA01SW05(121814)		0905	SW	9	3		1			5	X	X	X	X	X	
	HA01SW04(121814)		0945	SW	9	3		1			5	X	X	X	X	X	
	HA01SD06(121814)		0840	SD	5						5	X	X	X	X	X	
	HA01SD05(121814)		0900	SD	5						5	X	X	X	X	X	
	HA01SD04(121814)		0920	SD	5						5	X	X	X	X	X	
	TRIP BLANK	↓	—	TB	2	2						X					

SAF 12/18/14

Comments:

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Sample Custody

Relinquished by:	Date/Time: 12/18/14 1800	Received by:	Date/Time:
Relinquished by: FedEx	Date/Time: 12/19/14 1010	Received by:	Date/Time: 12/19/14 1010
Subcontact? Y or N If yes, where?	Custody Seal(s) intact? Y or N	On Ice? Y or N	Cooler Temp: 1.7 °C

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer

Level 1 Report v2.1

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 16

Replaces Date: 07/15/14
Effective Date: 11/07/14

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: MAM/12/8/14 Lot #: 249009

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☑		1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt: 1.2/1.7°C ___/___/___°C ___/___/___°C ___/___/___°C Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: #4 IR Gun Correction Factor: 0.1°C Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.)
Yes ☑	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐		5. Were proper custody procedures (relinquished/received) followed?
Yes ☐	No ☑	NA ☐	5a Were samples relinquished by client to commercial courier?
Yes ☑	No ☐		6. Were sample IDs listed on the COC?
Yes ☑	No ☐		7. Were sample IDs listed on all sample containers?
Yes ☑	No ☐		8. Was collection date & time listed on the COC?
Yes ☑	No ☐		9. Was collection date & time listed on all sample containers?
Yes ☑	No ☐		10. Did all container label information (ID, date, time) agree with the COC?
Yes ☑	No ☐		11. Were tests to be performed listed on the COC?
Yes ☑	No ☐		12. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐		13. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐		14. Was adequate sample volume available?
Yes ☑	No ☐		15. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑		16. Were any samples containers missing?
Yes ☐	No ☑		17. Were there any excess samples not listed on COC?
Yes ☐	No ☑	NA ☐	18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	20. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	22. Were collection temperatures documented on the COC for NC samples?
Yes ☐	No ☐	NA ☑	23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
Yes ☐	No ☑		24. Was the quote number used taken from the container label?
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)			
Sample(s)_____were received incorrectly preserved and were adjusted accordingly in sample receiving with _____(H_2SO_4,HNO_3,HCl,NaOH) using SR # _____.			
Sample(s) _____were received with bubbles >6 mm in diameter.			
Sample(s)_____were received with TRC >0.2 mg/L (If #21 is No)			
SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____ Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR#_____			
Sample labels applied by: MAM Verified by:_____ Date: 12/18/14			

Comments:

_____

_____

_____

_____

Report of Analysis

ARCADIS U.S., Inc.
30 Patewood Drive
Suite 155
Greenville, SC 29615
Attention: Rachelle Borne

Project Name: HAA-01

Project Number: 1015300.0001.DE001

Lot Number: PL20001

Date Completed: 01/05/2015



Nisreen Saikaly
Project Manager

This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* P L 2 0 0 0 1 *

Case Narrative
ARCADIS U.S., Inc.
Lot Number: PL20001

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Hexavalent Chromium

Samples were received outside the holding time for Hexavalent Chromium analysis.

The MS/MSD recoveries in batches 63608 and 63607 were outside acceptance criteria. All other QA/QC criteria for the batch were within acceptance criteria and method control limits. The MS/MSD recovery results are attributed to matrix interference. The associated sample results were reported and no corrective action was required.

Sample Summary
ARCADIS U.S., Inc.
Lot Number: PL20001

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	HA01COEMW08(121914)	Aqueous	12/19/2014 0911	12/20/2014
002	HA01MW12D(121914)	Aqueous	12/19/2014 1011	12/20/2014
003	HA01MW12(121914)	Aqueous	12/19/2014 1047	12/20/2014
004	HA01COEMW06(121914)	Aqueous	12/19/2014 1137	12/20/2014
005	HA01MW13(121914)	Aqueous	12/19/2014 0922	12/20/2014
006	HA01COEMW07(121914)	Aqueous	12/19/2014 1006	12/20/2014
007	HA01HMW21(121914)	Aqueous	12/19/2014 1106	12/20/2014
008	HA01COEMW05(121914)	Aqueous	12/19/2014 1212	12/20/2014
009	HA01COEMW04(121914)	Aqueous	12/19/2014 1231	12/20/2014
010	TRIP BLANK	Aqueous	12/19/2014	12/20/2014

(10 samples)

Executive Summary
ARCADIS U.S., Inc.
Lot Number: PL20001

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	HA01COEMW08(121914)	Aqueous	cis-1,2-Dichloroethene	8260B	110		ug/L	7
001	HA01COEMW08(121914)	Aqueous	Dissolved Barium	6010C	0.099		mg/L	9
001	HA01COEMW08(121914)	Aqueous	Dissolved Lead	6010C	0.0053	J	mg/L	9
001	HA01COEMW08(121914)	Aqueous	Dissolved Mercury	7470A	0.000024	J	mg/L	9
001	HA01COEMW08(121914)	Aqueous	Barium	6010C	0.13		mg/L	10
001	HA01COEMW08(121914)	Aqueous	Lead	6010C	0.0057	J	mg/L	10
003	HA01MW12(121914)	Aqueous	Barium	6010C	0.074		mg/L	16
003	HA01MW12(121914)	Aqueous	Lead	6010C	0.0054	J	mg/L	16
003	HA01MW12(121914)	Aqueous	Mercury	7470A	0.000016	J	mg/L	16
004	HA01COEMW06(121914)	Aqueous	trans-1,2-Dichloroethene	8260B	2.4	J	ug/L	18
004	HA01COEMW06(121914)	Aqueous	cis-1,2-Dichloroethene	8260B	850		ug/L	18
004	HA01COEMW06(121914)	Aqueous	1,1-Dichloroethene	8260B	2.1	J	ug/L	18
004	HA01COEMW06(121914)	Aqueous	Vinyl chloride	8260B	2.1	J	ug/L	18
004	HA01COEMW06(121914)	Aqueous	Barium	6010C	0.046		mg/L	20
004	HA01COEMW06(121914)	Aqueous	Lead	6010C	0.0055	J	mg/L	20
005	HA01MW13(121914)	Aqueous	Barium	6010C	0.079		mg/L	24
005	HA01MW13(121914)	Aqueous	Lead	6010C	0.0070	J	mg/L	24
006	HA01COEMW07(121914)	Aqueous	trans-1,2-Dichloroethene	8260B	6.9	J	ug/L	25
006	HA01COEMW07(121914)	Aqueous	cis-1,2-Dichloroethene	8260B	1500		ug/L	25
006	HA01COEMW07(121914)	Aqueous	1,1-Dichloroethene	8260B	4.3	J	ug/L	25
007	HA01HMW21(121914)	Aqueous	trans-1,2-Dichloroethene	8260B	10	J	ug/L	28
007	HA01HMW21(121914)	Aqueous	cis-1,2-Dichloroethene	8260B	2300		ug/L	28
007	HA01HMW21(121914)	Aqueous	1,1-Dichloroethene	8260B	3.7	J	ug/L	28
007	HA01HMW21(121914)	Aqueous	Vinyl chloride	8260B	20		ug/L	28
007	HA01HMW21(121914)	Aqueous	Dissolved Barium	6010C	0.016	J	mg/L	30
007	HA01HMW21(121914)	Aqueous	Dissolved Lead	6010C	0.0054	J	mg/L	30
007	HA01HMW21(121914)	Aqueous	Barium	6010C	0.069		mg/L	31
007	HA01HMW21(121914)	Aqueous	Chromium	6010C	0.0043	J	mg/L	31
007	HA01HMW21(121914)	Aqueous	Lead	6010C	0.010		mg/L	31
007	HA01HMW21(121914)	Aqueous	Mercury	7470A	0.00010		mg/L	31
008	HA01COEMW05(121914)	Aqueous	Benzene	8260B	0.46	J	ug/L	33
008	HA01COEMW05(121914)	Aqueous	trans-1,2-Dichloroethene	8260B	1.1		ug/L	33
008	HA01COEMW05(121914)	Aqueous	cis-1,2-Dichloroethene	8260B	180		ug/L	33
008	HA01COEMW05(121914)	Aqueous	1,1-Dichloroethene	8260B	0.26	J	ug/L	33
008	HA01COEMW05(121914)	Aqueous	Vinyl chloride	8260B	9.6		ug/L	33
008	HA01COEMW05(121914)	Aqueous	Barium	6010C	0.026		mg/L	35
008	HA01COEMW05(121914)	Aqueous	Lead	6010C	0.0059	J	mg/L	35
008	HA01COEMW05(121914)	Aqueous	Mercury	7470A	0.000037	J	mg/L	35
009	HA01COEMW04(121914)	Aqueous	trans-1,2-Dichloroethene	8260B	12	J	ug/L	37
009	HA01COEMW04(121914)	Aqueous	cis-1,2-Dichloroethene	8260B	1400		ug/L	37
009	HA01COEMW04(121914)	Aqueous	Vinyl chloride	8260B	59		ug/L	37
009	HA01COEMW04(121914)	Aqueous	Barium	6010C	0.019	J	mg/L	39
009	HA01COEMW04(121914)	Aqueous	Lead	6010C	0.0044	J	mg/L	39
009	HA01COEMW04(121914)	Aqueous	Mercury	7470A	0.000016	J	mg/L	39
010	TRIP BLANK	Aqueous	Carbon disulfide	8260B	0.25	J	ug/L	40

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page

(45 detections)

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-001
Description: HA01COEMW08(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0911
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/20/2014 1016	MJI		63607
1		(Hexavalent C) 7196A	1	12/20/2014 1016	MJI		63608

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1
Hexavalent Chromium - Dissolved	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-001
Description: HA01COEMW08(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0911
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	5030B	8260B	20	12/31/2014 0051	PMM2		64324

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		400	130	ug/L	2
Benzene	71-43-2	8260B	ND		20	2.6	ug/L	2
Bromodichloromethane	75-27-4	8260B	ND		20	6.6	ug/L	2
Bromoform	75-25-2	8260B	ND		20	13	ug/L	2
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		40	16	ug/L	2
2-Butanone (MEK)	78-93-3	8260B	ND		200	41	ug/L	2
Carbon disulfide	75-15-0	8260B	ND		20	1.9	ug/L	2
Carbon tetrachloride	56-23-5	8260B	ND		20	2.7	ug/L	2
Chlorobenzene	108-90-7	8260B	ND		40	6.6	ug/L	2
Chloroethane	75-00-3	8260B	ND		40	9.4	ug/L	2
Chloroform	67-66-3	8260B	ND		20	6.6	ug/L	2
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		20	7.0	ug/L	2
Dibromochloromethane	124-48-1	8260B	ND		20	6.6	ug/L	2
1,4-Dichlorobenzene	106-46-7	8260B	ND		20	6.6	ug/L	2
1,3-Dichlorobenzene	541-73-1	8260B	ND		20	6.6	ug/L	2
1,2-Dichlorobenzene	95-50-1	8260B	ND		20	6.6	ug/L	2
1,2-Dichloroethane	107-06-2	8260B	ND		20	2.9	ug/L	2
1,1-Dichloroethane	75-34-3	8260B	ND		20	2.6	ug/L	2
trans-1,2-Dichloroethene	156-60-5	8260B	ND		20	4.1	ug/L	2
cis-1,2-Dichloroethene	156-59-2	8260B	110		20	2.4	ug/L	2
1,1-Dichloroethene	75-35-4	8260B	ND		20	3.2	ug/L	2
1,2-Dichloropropane	78-87-5	8260B	ND		20	3.8	ug/L	2
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		20	2.1	ug/L	2
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		20	1.8	ug/L	2
Ethylbenzene	100-41-4	8260B	ND		20	6.6	ug/L	2
2-Hexanone	591-78-6	8260B	ND		200	5.5	ug/L	2
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		20	8.0	ug/L	2
4-Methyl-2-pentanone	108-10-1	8260B	ND		200	6.2	ug/L	2
Methylene chloride	75-09-2	8260B	ND		20	6.6	ug/L	2
Styrene	100-42-5	8260B	ND		20	2.4	ug/L	2
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		20	3.3	ug/L	2
Tetrachloroethene	127-18-4	8260B	ND		20	2.6	ug/L	2
Toluene	108-88-3	8260B	ND		20	6.6	ug/L	2
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		20	10	ug/L	2
1,1,2-Trichloroethane	79-00-5	8260B	ND		20	4.2	ug/L	2
1,1,1-Trichloroethane	71-55-6	8260B	ND		20	1.5	ug/L	2
Trichloroethene	79-01-6	8260B	ND		20	3.6	ug/L	2
Vinyl chloride	75-01-4	8260B	ND		20	1.1	ug/L	2
Xylenes (total)	1330-20-7	8260B	ND		20	6.6	ug/L	2

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-001
Description: HA01COEMW08(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0911
Date Received: 12/20/2014

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		106	70-130
Bromofluorobenzene		112	70-130
Toluene-d8		103	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Dissolved RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-001
Description: HA01COEMW08(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0911
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1324	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 1928	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1054	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Dissolved Barium	7440-39-3	6010C	0.099		0.025	0.0075	mg/L	1
Dissolved Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Dissolved Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Dissolved Lead	7439-92-1	6010C	0.0053	J	0.010	0.0019	mg/L	1
Dissolved Mercury	7439-97-6	7470A	0.000024	J	0.00010	0.000015	mg/L	1
Dissolved Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Dissolved Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-001
Description: HA01COEMW08(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0911
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1319	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 1924	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1050	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Barium	7440-39-3	6010C	0.13		0.025	0.0075	mg/L	1
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Lead	7439-92-1	6010C	0.0057	J	0.010	0.0019	mg/L	1
Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-002
Description: HA01MW12D(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1011
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 0006	PMM2		64227

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-002
Description: HA01MW12D(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1011
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		101	70-130
Toluene-d8		99	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-003
Description: HA01MW12(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1047
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/20/2014 1016	MJI		63607

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-003
Description: HA01MW12(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1047
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 0029	PMM2		64227

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-003
Description: HA01MW12(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1047
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		104	70-130
Bromofluorobenzene		101	70-130
Toluene-d8		101	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-003
Description: HA01MW12(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1047
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1326	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 1932	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1058	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Barium	7440-39-3	6010C	0.074		0.025	0.0075	mg/L	1
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Lead	7439-92-1	6010C	0.0054	J	0.010	0.0019	mg/L	1
Mercury	7439-97-6	7470A	0.000016	J	0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-004
Description: HA01COEMW06(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1137
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/20/2014 1021	MJI		63607

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-004
Description: HA01COEMW06(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1137
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	10	12/30/2014 0506	PMM2		64227

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		200	67	ug/L	1
Benzene	71-43-2	8260B	ND		10	1.3	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		10	3.3	ug/L	1
Bromoform	75-25-2	8260B	ND		10	6.6	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		20	8.0	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		100	20	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		10	0.97	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		10	1.4	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		20	3.3	ug/L	1
Chloroethane	75-00-3	8260B	ND		20	4.7	ug/L	1
Chloroform	67-66-3	8260B	ND		10	3.3	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		10	3.5	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		10	3.3	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		10	3.3	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		10	3.3	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		10	3.3	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		10	1.5	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		10	1.3	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	2.4	J	10	2.1	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	850		10	1.2	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	2.1	J	10	1.6	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		10	1.9	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		10	1.1	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		10	0.92	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		10	3.3	ug/L	1
2-Hexanone	591-78-6	8260B	ND		100	2.7	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		10	4.0	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		100	3.1	ug/L	1
Methylene chloride	75-09-2	8260B	ND		10	3.3	ug/L	1
Styrene	100-42-5	8260B	ND		10	1.2	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		10	1.6	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		10	1.3	ug/L	1
Toluene	108-88-3	8260B	ND		10	3.3	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		10	5.1	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		10	2.1	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		10	0.74	ug/L	1
Trichloroethene	79-01-6	8260B	ND		10	1.8	ug/L	1
Vinyl chloride	75-01-4	8260B	2.1	J	10	0.54	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		10	3.3	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-004
Description: HA01COEMW06(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1137
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		106	70-130
Bromofluorobenzene		101	70-130
Toluene-d8		105	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-004
Description: HA01COEMW06(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1137
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1332	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 1945	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1110	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Barium	7440-39-3	6010C	0.046		0.025	0.0075	mg/L	1
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Lead	7439-92-1	6010C	0.0055	J	0.010	0.0019	mg/L	1
Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-005
Description: HA01MW13(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0922
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/20/2014 1016	MJI		63607

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-005
Description: HA01MW13(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0922
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 0052	PMM2		64227

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-005
Description: HA01MW13(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0922
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		100	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-005
Description: HA01MW13(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 0922
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1334	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 1949	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1115	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Barium	7440-39-3	6010C	0.079		0.025	0.0075	mg/L	1
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Lead	7439-92-1	6010C	0.0070	J	0.010	0.0019	mg/L	1
Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-006
Description: HA01COEMW07(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1006
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	10	12/30/2014 0529	PMM2		64227

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		200	67	ug/L	1
Benzene	71-43-2	8260B	ND		10	1.3	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		10	3.3	ug/L	1
Bromoform	75-25-2	8260B	ND		10	6.6	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		20	8.0	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		100	20	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		10	0.97	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		10	1.4	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		20	3.3	ug/L	1
Chloroethane	75-00-3	8260B	ND		20	4.7	ug/L	1
Chloroform	67-66-3	8260B	ND		10	3.3	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		10	3.5	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		10	3.3	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		10	3.3	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		10	3.3	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		10	3.3	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		10	1.5	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		10	1.3	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	6.9	J	10	2.1	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	1500		10	1.2	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	4.3	J	10	1.6	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		10	1.9	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		10	1.1	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		10	0.92	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		10	3.3	ug/L	1
2-Hexanone	591-78-6	8260B	ND		100	2.7	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		10	4.0	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		100	3.1	ug/L	1
Methylene chloride	75-09-2	8260B	ND		10	3.3	ug/L	1
Styrene	100-42-5	8260B	ND		10	1.2	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		10	1.6	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		10	1.3	ug/L	1
Toluene	108-88-3	8260B	ND		10	3.3	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		10	5.1	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		10	2.1	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		10	0.74	ug/L	1
Trichloroethene	79-01-6	8260B	ND		10	1.8	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		10	0.54	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		10	3.3	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-006
Description: HA01COEMW07(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1006
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		107	70-130
Bromofluorobenzene		105	70-130
Toluene-d8		98	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-007
Description: HA01HMW21(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1106
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/20/2014 1016	MJI		63607
1		(Hexavalent C) 7196A	1	12/20/2014 1016	MJI		63608

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		0.020	0.0081	mg/L	1
Hexavalent Chromium - Dissolved	18540-29-9	7196A	ND		0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-007
Description: HA01HMW21(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1106
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	20	12/30/2014 0552	PMM2		64227

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		400	130	ug/L	1
Benzene	71-43-2	8260B	ND		20	2.6	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		20	6.6	ug/L	1
Bromoform	75-25-2	8260B	ND		20	13	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		40	16	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		200	41	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		20	1.9	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		20	2.7	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		40	6.6	ug/L	1
Chloroethane	75-00-3	8260B	ND		40	9.4	ug/L	1
Chloroform	67-66-3	8260B	ND		20	6.6	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		20	7.0	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		20	6.6	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		20	6.6	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		20	6.6	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		20	6.6	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		20	2.9	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		20	2.6	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	10	J	20	4.1	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	2300		20	2.4	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	3.7	J	20	3.2	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		20	3.8	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		20	2.1	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		20	1.8	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		20	6.6	ug/L	1
2-Hexanone	591-78-6	8260B	ND		200	5.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		20	8.0	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		200	6.2	ug/L	1
Methylene chloride	75-09-2	8260B	ND		20	6.6	ug/L	1
Styrene	100-42-5	8260B	ND		20	2.4	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		20	3.3	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		20	2.6	ug/L	1
Toluene	108-88-3	8260B	ND		20	6.6	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		20	10	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		20	4.2	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		20	1.5	ug/L	1
Trichloroethene	79-01-6	8260B	ND		20	3.6	ug/L	1
Vinyl chloride	75-01-4	8260B	20		20	1.1	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		20	6.6	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-007
Description: HA01HMW21(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1106
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		102	70-130
Toluene-d8		103	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Dissolved RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-007
Description: HA01HMW21(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1106
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1337	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 1957	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1123	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Dissolved Barium	7440-39-3	6010C	0.016	J	0.025	0.0075	mg/L	1
Dissolved Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Dissolved Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Dissolved Lead	7439-92-1	6010C	0.0054	J	0.010	0.0019	mg/L	1
Dissolved Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1
Dissolved Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Dissolved Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-007
Description: HA01HMW21(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1106
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1335	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 1953	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1119	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Barium	7440-39-3	6010C	0.069		0.025	0.0075	mg/L	1
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Chromium	7440-47-3	6010C	0.0043	J	0.0050	0.0021	mg/L	2
Lead	7439-92-1	6010C	0.010		0.010	0.0019	mg/L	1
Mercury	7439-97-6	7470A	0.00010		0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-008
Description: HA01COEMW05(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1212
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/20/2014 1021	MJI		63607

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-008
Description: HA01COEMW05(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1212
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 0443	PMM2		64227
2	5030B	8260B	5	12/31/2014 0113	PMM2		64324

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	0.46	J	1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	1.1		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	180		5.0	0.61	ug/L	2
1,1-Dichloroethene	75-35-4	8260B	0.26	J	1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	9.6		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-008
Description: HA01COEMW05(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1212
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		109	70-130		100	70-130
Bromofluorobenzene		100	70-130		107	70-130
Toluene-d8		103	70-130		99	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-008
Description: HA01COEMW05(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1212
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1339	HKB	12/30/2014 0946	64238
1	3005A	6010C	1	12/31/2014 2001	ECS	12/23/2014 1605	63839
2	3005A	6010C	1	01/02/2015 1127	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Barium	7440-39-3	6010C	0.026		0.025	0.0075	mg/L	1
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Lead	7439-92-1	6010C	0.0059	J	0.010	0.0019	mg/L	1
Mercury	7439-97-6	7470A	0.000037	J	0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-009
Description: HA01COEMW04(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1231
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/20/2014 1021	MJI		63607

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND		0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-009
Description: HA01COEMW04(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1231
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	20	12/30/2014 0615	PMM2		64227

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		400	130	ug/L	1
Benzene	71-43-2	8260B	ND		20	2.6	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		20	6.6	ug/L	1
Bromoform	75-25-2	8260B	ND		20	13	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		40	16	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		200	41	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		20	1.9	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		20	2.7	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		40	6.6	ug/L	1
Chloroethane	75-00-3	8260B	ND		40	9.4	ug/L	1
Chloroform	67-66-3	8260B	ND		20	6.6	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		20	7.0	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		20	6.6	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		20	6.6	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		20	6.6	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		20	6.6	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		20	2.9	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		20	2.6	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	12	J	20	4.1	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	1400		20	2.4	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		20	3.2	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		20	3.8	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		20	2.1	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		20	1.8	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		20	6.6	ug/L	1
2-Hexanone	591-78-6	8260B	ND		200	5.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		20	8.0	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		200	6.2	ug/L	1
Methylene chloride	75-09-2	8260B	ND		20	6.6	ug/L	1
Styrene	100-42-5	8260B	ND		20	2.4	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		20	3.3	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		20	2.6	ug/L	1
Toluene	108-88-3	8260B	ND		20	6.6	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		20	10	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		20	4.2	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		20	1.5	ug/L	1
Trichloroethene	79-01-6	8260B	ND		20	3.6	ug/L	1
Vinyl chloride	75-01-4	8260B	59		20	1.1	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		20	6.6	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-009
Description: HA01COEMW04(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1231
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		104	70-130
Bromofluorobenzene		98	70-130
Toluene-d8		104	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-009
Description: HA01COEMW04(121914)
Matrix: Aqueous
Date Sampled: 12/19/2014 1231
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1341	HKB	12/30/2014 0946	64238
2	3005A	6010C	1	01/02/2015 1131	ECS	12/23/2014 1605	63839

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	2
Barium	7440-39-3	6010C	0.019	J	0.025	0.0075	mg/L	2
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	2
Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	2
Lead	7439-92-1	6010C	0.0044	J	0.010	0.0019	mg/L	2
Mercury	7439-97-6	7470A	0.000016	J	0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	2
Silver	7440-22-4	6010C	ND		0.0050	0.00040	mg/L	2

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-010
Description: TRIP BLANK
Matrix: Aqueous
Date Sampled: 12/19/2014
Date Received: 12/20/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/29/2014 1141	DCS		64151

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	0.25	J	1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL20001-010
Description: TRIP BLANK
Matrix: Aqueous
Date Sampled: 12/19/2014
Date Received: 12/20/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		103	70-130
Bromofluorobenzene		109	70-130
Toluene-d8		101	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

QC Summary

Inorganic non-metals - MB

Sample ID: PQ63607-001
Batch: 63607
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Hexavalent Chromium	ND		1	0.020	0.0081	mg/L	12/20/2014 1016

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: PQ63607-002
Batch: 63607
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	0.10	0.098		1	98	90-110	12/20/2014 1016

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL20001-009MS
Batch: 63607
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	ND	0.10	ND	N	1	0.00	75-125	12/20/2014 1021

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: PL20001-009MD
Batch: 63607
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Hexavalent Chromium	ND	0.10	ND	N	1	0.00	0.00	75-125	20	12/20/2014 1021

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: PQ63608-001
Batch: 63608
Analytical Method: 7196A

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Hexavalent Chromium - Dissolved	ND		1	0.020	0.0081	mg/L	12/20/2014 1016

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: PQ63608-002
Batch: 63608
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium - Dissolved	0.10	0.098		1	98	90-110	12/20/2014 1016

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL20001-007MS
Batch: 63608
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium - Dissolved	ND	0.10	ND	N	1	0.00	75-125	12/20/2014 1016

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: PL20001-007MD
Batch: 63608
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Hexavalent Chromium - Dissolved	ND	0.10	ND	N	1	0.00	0.00	75-125	20	12/20/2014 1016

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ64151-001
Batch: 64151
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/L	12/29/2014 1042
Benzene	ND		1	1.0	0.13	ug/L	12/29/2014 1042
Bromodichloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 1042
Bromoform	ND		1	1.0	0.66	ug/L	12/29/2014 1042
Bromomethane (Methyl bromide)	ND		1	2.0	0.80	ug/L	12/29/2014 1042
2-Butanone (MEK)	ND		1	10	2.0	ug/L	12/29/2014 1042
Carbon disulfide	ND		1	1.0	0.097	ug/L	12/29/2014 1042
Carbon tetrachloride	ND		1	1.0	0.14	ug/L	12/29/2014 1042
Chlorobenzene	ND		1	2.0	0.33	ug/L	12/29/2014 1042
Chloroethane	ND		1	2.0	0.47	ug/L	12/29/2014 1042
Chloroform	ND		1	1.0	0.33	ug/L	12/29/2014 1042
Chloromethane (Methyl chloride)	ND		1	1.0	0.35	ug/L	12/29/2014 1042
Dibromochloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,4-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,3-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,2-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	12/29/2014 1042
1,1-Dichloroethane	ND		1	1.0	0.13	ug/L	12/29/2014 1042
cis-1,2-Dichloroethene	ND		1	1.0	0.12	ug/L	12/29/2014 1042
trans-1,2-Dichloroethene	ND		1	1.0	0.21	ug/L	12/29/2014 1042
1,1-Dichloroethene	ND		1	1.0	0.16	ug/L	12/29/2014 1042
1,2-Dichloropropane	ND		1	1.0	0.19	ug/L	12/29/2014 1042
trans-1,3-Dichloropropene	ND		1	1.0	0.11	ug/L	12/29/2014 1042
cis-1,3-Dichloropropene	ND		1	1.0	0.092	ug/L	12/29/2014 1042
Ethylbenzene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
2-Hexanone	ND		1	10	0.27	ug/L	12/29/2014 1042
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	12/29/2014 1042
4-Methyl-2-pentanone	ND		1	10	0.31	ug/L	12/29/2014 1042
Methylene chloride	ND		1	1.0	0.33	ug/L	12/29/2014 1042
Styrene	ND		1	1.0	0.12	ug/L	12/29/2014 1042
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.16	ug/L	12/29/2014 1042
Tetrachloroethene	ND		1	1.0	0.13	ug/L	12/29/2014 1042
Toluene	ND		1	1.0	0.33	ug/L	12/29/2014 1042
1,2,4-Trichlorobenzene	ND		1	1.0	0.51	ug/L	12/29/2014 1042
1,1,2-Trichloroethane	ND		1	1.0	0.21	ug/L	12/29/2014 1042
1,1,1-Trichloroethane	ND		1	1.0	0.074	ug/L	12/29/2014 1042
Trichloroethene	ND		1	1.0	0.18	ug/L	12/29/2014 1042
Vinyl chloride	ND		1	1.0	0.054	ug/L	12/29/2014 1042
Xylenes (total)	ND		1	1.0	0.33	ug/L	12/29/2014 1042

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		113	70-130
1,2-Dichloroethane-d4		105	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64151-002
Batch: 64151
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	95		1	95	60-140	12/29/2014 0946
Benzene	50	44		1	89	70-130	12/29/2014 0946
Bromodichloromethane	50	45		1	90	70-130	12/29/2014 0946
Bromoform	50	49		1	99	70-130	12/29/2014 0946
Bromomethane (Methyl bromide)	50	52		1	103	60-140	12/29/2014 0946
2-Butanone (MEK)	100	95		1	95	60-140	12/29/2014 0946
Carbon disulfide	50	48		1	95	60-140	12/29/2014 0946
Carbon tetrachloride	50	47		1	94	70-130	12/29/2014 0946
Chlorobenzene	50	45		1	90	70-130	12/29/2014 0946
Chloroethane	50	53		1	107	42-163	12/29/2014 0946
Chloroform	50	45		1	90	70-130	12/29/2014 0946
Chloromethane (Methyl chloride)	50	54		1	107	60-140	12/29/2014 0946
Dibromochloromethane	50	47		1	94	70-130	12/29/2014 0946
1,4-Dichlorobenzene	50	44		1	87	70-130	12/29/2014 0946
1,3-Dichlorobenzene	50	44		1	88	70-130	12/29/2014 0946
1,2-Dichlorobenzene	50	44		1	89	70-130	12/29/2014 0946
1,2-Dichloroethane	50	47		1	94	70-130	12/29/2014 0946
1,1-Dichloroethane	50	46		1	92	70-130	12/29/2014 0946
cis-1,2-Dichloroethene	50	45		1	89	70-130	12/29/2014 0946
trans-1,2-Dichloroethene	50	44		1	89	70-130	12/29/2014 0946
1,1-Dichloroethene	50	46		1	91	70-130	12/29/2014 0946
1,2-Dichloropropane	50	45		1	91	70-130	12/29/2014 0946
trans-1,3-Dichloropropene	50	47		1	94	70-130	12/29/2014 0946
cis-1,3-Dichloropropene	50	47		1	93	70-130	12/29/2014 0946
Ethylbenzene	50	46		1	93	70-130	12/29/2014 0946
2-Hexanone	100	93		1	93	60-140	12/29/2014 0946
Methyl tertiary butyl ether (MTBE)	50	46		1	93	70-130	12/29/2014 0946
4-Methyl-2-pentanone	100	95		1	95	60-140	12/29/2014 0946
Methylene chloride	50	43		1	87	70-130	12/29/2014 0946
Styrene	50	46		1	93	70-130	12/29/2014 0946
1,1,2,2-Tetrachloroethane	50	46		1	93	60-140	12/29/2014 0946
Tetrachloroethene	50	46		1	92	70-130	12/29/2014 0946
Toluene	50	44		1	89	70-130	12/29/2014 0946
1,2,4-Trichlorobenzene	50	44		1	88	70-130	12/29/2014 0946
1,1,2-Trichloroethane	50	46		1	91	70-130	12/29/2014 0946
1,1,1-Trichloroethane	50	46		1	92	70-130	12/29/2014 0946
Trichloroethene	50	45		1	90	70-130	12/29/2014 0946
Vinyl chloride	50	53		1	105	70-130	12/29/2014 0946
Xylenes (total)	100	91		1	91	70-130	12/29/2014 0946

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		106	70-130
1,2-Dichloroethane-d4		101	70-130
Toluene-d8		103	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MS

Sample ID: PL20001-001MS
Batch: 64151
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	ND	500000	440000		5000	88	60-140	12/29/2014 1832
Benzene	ND	250000	230000		5000	92	72-127	12/29/2014 1832
Bromodichloromethane	ND	250000	230000		5000	93	71-143	12/29/2014 1832
Bromoform	ND	250000	250000		5000	99	65-131	12/29/2014 1832
Bromomethane (Methyl bromide)	ND	250000	270000		5000	110	36-168	12/29/2014 1832
2-Butanone (MEK)	ND	500000	460000		5000	92	60-140	12/29/2014 1832
Carbon disulfide	ND	250000	250000		5000	99	60-140	12/29/2014 1832
Carbon tetrachloride	ND	250000	240000		5000	97	37-166	12/29/2014 1832
Chlorobenzene	ND	250000	230000		5000	92	78-129	12/29/2014 1832
Chloroethane	ND	250000	280000		5000	114	60-140	12/29/2014 1832
Chloroform	ND	250000	240000		5000	94	63-123	12/29/2014 1832
Chloromethane (Methyl chloride)	ND	250000	290000		5000	115	20-158	12/29/2014 1832
Dibromochloromethane	ND	250000	240000		5000	97	74-134	12/29/2014 1832
1,4-Dichlorobenzene	ND	250000	220000		5000	88	70-130	12/29/2014 1832
1,3-Dichlorobenzene	ND	250000	220000		5000	89	70-130	12/29/2014 1832
1,2-Dichlorobenzene	ND	250000	230000		5000	91	70-130	12/29/2014 1832
1,2-Dichloroethane	ND	250000	240000		5000	97	59-143	12/29/2014 1832
1,1-Dichloroethane	ND	250000	240000		5000	98	69-132	12/29/2014 1832
trans-1,2-Dichloroethene	ND	250000	230000		5000	93	67-141	12/29/2014 1832
cis-1,2-Dichloroethene	110	250000	230000		5000	93	70-130	12/29/2014 1832
1,1-Dichloroethene	ND	250000	240000		5000	97	50-132	12/29/2014 1832
1,2-Dichloropropane	ND	250000	240000		5000	95	71-126	12/29/2014 1832
trans-1,3-Dichloropropene	ND	250000	230000		5000	94	73-131	12/29/2014 1832
cis-1,3-Dichloropropene	ND	250000	230000		5000	92	69-130	12/29/2014 1832
Ethylbenzene	ND	250000	230000		5000	94	79-132	12/29/2014 1832
2-Hexanone	ND	500000	470000		5000	95	60-140	12/29/2014 1832
Methyl tertiary butyl ether (MTBE)	ND	250000	240000		5000	95	60-140	12/29/2014 1832
4-Methyl-2-pentanone	ND	500000	480000		5000	95	60-140	12/29/2014 1832
Methylene chloride	ND	250000	230000		5000	92	69-129	12/29/2014 1832
Styrene	ND	250000	230000		5000	93	70-130	12/29/2014 1832
1,1,2,2-Tetrachloroethane	ND	250000	240000		5000	95	60-155	12/29/2014 1832
Tetrachloroethene	ND	250000	230000		5000	90	70-130	12/29/2014 1832
Toluene	ND	250000	220000		5000	89	75-125	12/29/2014 1832
1,2,4-Trichlorobenzene	ND	250000	220000		5000	88	70-130	12/29/2014 1832
1,1,2-Trichloroethane	ND	250000	230000		5000	93	77-132	12/29/2014 1832
1,1,1-Trichloroethane	ND	250000	240000		5000	97	77-132	12/29/2014 1832
Trichloroethene	ND	250000	230000		5000	92	73-124	12/29/2014 1832
Vinyl chloride	ND	250000	280000		5000	113	29-159	12/29/2014 1832
Xylenes (total)	ND	500000	460000		5000	91	70-130	12/29/2014 1832

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		104	70-130
Bromofluorobenzene		111	70-130
Toluene-d8		105	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MSD

Sample ID: PL20001-001MD
Batch: 64151
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Acetone	ND	500000	420000		5000	83	5.5	60-140	20	12/29/2014 1854
Benzene	ND	250000	230000		5000	92	0.021	72-127	20	12/29/2014 1854
Bromodichloromethane	ND	250000	230000		5000	92	1.2	71-143	20	12/29/2014 1854
Bromoform	ND	250000	250000		5000	100	1.3	65-131	20	12/29/2014 1854
Bromomethane (Methyl bromide)	ND	250000	280000		5000	113	3.1	36-168	20	12/29/2014 1854
2-Butanone (MEK)	ND	500000	450000		5000	91	1.5	60-140	20	12/29/2014 1854
Carbon disulfide	ND	250000	250000		5000	98	1.2	60-140	20	12/29/2014 1854
Carbon tetrachloride	ND	250000	240000		5000	98	0.81	37-166	20	12/29/2014 1854
Chlorobenzene	ND	250000	230000		5000	92	0.076	78-129	20	12/29/2014 1854
Chloroethane	ND	250000	290000		5000	118	3.5	60-140	20	12/29/2014 1854
Chloroform	ND	250000	240000		5000	95	1.0	63-123	20	12/29/2014 1854
Chloromethane (Methyl chloride)	ND	250000	290000		5000	118	2.4	20-158	20	12/29/2014 1854
Dibromochloromethane	ND	250000	240000		5000	97	0.27	74-134	20	12/29/2014 1854
1,4-Dichlorobenzene	ND	250000	230000		5000	90	2.3	70-130	20	12/29/2014 1854
1,3-Dichlorobenzene	ND	250000	230000		5000	91	1.7	70-130	20	12/29/2014 1854
1,2-Dichlorobenzene	ND	250000	230000		5000	93	2.0	70-130	20	12/29/2014 1854
1,2-Dichloroethane	ND	250000	240000		5000	98	1.0	59-143	20	12/29/2014 1854
1,1-Dichloroethane	ND	250000	250000		5000	99	1.3	69-132	20	12/29/2014 1854
trans-1,2-Dichloroethene	ND	250000	230000		5000	94	0.51	67-141	20	12/29/2014 1854
cis-1,2-Dichloroethene	110	250000	240000		5000	95	2.2	70-130	20	12/29/2014 1854
1,1-Dichloroethene	ND	250000	240000		5000	98	0.29	50-132	20	12/29/2014 1854
1,2-Dichloropropane	ND	250000	240000		5000	95	0.23	71-126	20	12/29/2014 1854
trans-1,3-Dichloropropene	ND	250000	240000		5000	95	1.2	73-131	20	12/29/2014 1854
cis-1,3-Dichloropropene	ND	250000	230000		5000	92	0.12	69-130	20	12/29/2014 1854
Ethylbenzene	ND	250000	230000		5000	93	0.33	79-132	20	12/29/2014 1854
2-Hexanone	ND	500000	470000		5000	93	1.9	60-140	20	12/29/2014 1854
Methyl tertiary butyl ether (MTBE)	ND	250000	240000		5000	96	0.47	60-140	20	12/29/2014 1854
4-Methyl-2-pentanone	ND	500000	470000		5000	95	0.52	60-140	20	12/29/2014 1854
Methylene chloride	ND	250000	230000		5000	92	0.21	69-129	20	12/29/2014 1854
Styrene	ND	250000	230000		5000	93	0.88	70-130	20	12/29/2014 1854
1,1,2,2-Tetrachloroethane	ND	250000	240000		5000	98	2.9	60-155	20	12/29/2014 1854
Tetrachloroethene	ND	250000	230000		5000	92	1.4	70-130	20	12/29/2014 1854
Toluene	ND	250000	220000		5000	89	0.017	75-125	20	12/29/2014 1854
1,2,4-Trichlorobenzene	ND	250000	230000		5000	92	4.7	70-130	20	12/29/2014 1854
1,1,2-Trichloroethane	ND	250000	240000		5000	94	1.5	77-132	20	12/29/2014 1854
1,1,1-Trichloroethane	ND	250000	240000		5000	97	0.52	77-132	20	12/29/2014 1854
Trichloroethene	ND	250000	230000		5000	92	0.51	73-124	20	12/29/2014 1854
Vinyl chloride	ND	250000	290000		5000	117	3.0	29-159	20	12/29/2014 1854
Xylenes (total)	ND	500000	460000		5000	92	1.1	70-130	20	12/29/2014 1854

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		104	70-130
Bromofluorobenzene		111	70-130
Toluene-d8		104	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ64227-001
Batch: 64227
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/L	12/29/2014 2309
Benzene	ND		1	1.0	0.13	ug/L	12/29/2014 2309
Bromodichloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 2309
Bromoform	ND		1	1.0	0.66	ug/L	12/29/2014 2309
Bromomethane (Methyl bromide)	ND		1	2.0	0.80	ug/L	12/29/2014 2309
2-Butanone (MEK)	ND		1	10	2.0	ug/L	12/29/2014 2309
Carbon disulfide	ND		1	1.0	0.097	ug/L	12/29/2014 2309
Carbon tetrachloride	ND		1	1.0	0.14	ug/L	12/29/2014 2309
Chlorobenzene	ND		1	2.0	0.33	ug/L	12/29/2014 2309
Chloroethane	ND		1	2.0	0.47	ug/L	12/29/2014 2309
Chloroform	ND		1	1.0	0.33	ug/L	12/29/2014 2309
Chloromethane (Methyl chloride)	ND		1	1.0	0.35	ug/L	12/29/2014 2309
Dibromochloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,4-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,3-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,2-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	12/29/2014 2309
1,1-Dichloroethane	ND		1	1.0	0.13	ug/L	12/29/2014 2309
trans-1,2-Dichloroethene	ND		1	1.0	0.21	ug/L	12/29/2014 2309
cis-1,2-Dichloroethene	ND		1	1.0	0.12	ug/L	12/29/2014 2309
1,1-Dichloroethene	ND		1	1.0	0.16	ug/L	12/29/2014 2309
1,2-Dichloropropane	ND		1	1.0	0.19	ug/L	12/29/2014 2309
trans-1,3-Dichloropropene	ND		1	1.0	0.11	ug/L	12/29/2014 2309
cis-1,3-Dichloropropene	ND		1	1.0	0.092	ug/L	12/29/2014 2309
Ethylbenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
2-Hexanone	ND		1	10	0.27	ug/L	12/29/2014 2309
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	12/29/2014 2309
4-Methyl-2-pentanone	ND		1	10	0.31	ug/L	12/29/2014 2309
Methylene chloride	ND		1	1.0	0.33	ug/L	12/29/2014 2309
Styrene	ND		1	1.0	0.12	ug/L	12/29/2014 2309
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.16	ug/L	12/29/2014 2309
Tetrachloroethene	ND		1	1.0	0.13	ug/L	12/29/2014 2309
Toluene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,2,4-Trichlorobenzene	ND		1	1.0	0.51	ug/L	12/29/2014 2309
1,1,2-Trichloroethane	ND		1	1.0	0.21	ug/L	12/29/2014 2309
1,1,1-Trichloroethane	ND		1	1.0	0.074	ug/L	12/29/2014 2309
Trichloroethene	ND		1	1.0	0.18	ug/L	12/29/2014 2309
Vinyl chloride	ND		1	1.0	0.054	ug/L	12/29/2014 2309
Xylenes (total)	ND		1	1.0	0.33	ug/L	12/29/2014 2309

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		102	70-130
1,2-Dichloroethane-d4		107	70-130
Toluene-d8		100	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64227-002
Batch: 64227
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	91		1	91	60-140	12/29/2014 2145
Benzene	50	46		1	92	70-130	12/29/2014 2145
Bromodichloromethane	50	50		1	100	70-130	12/29/2014 2145
Bromoform	50	49		1	98	70-130	12/29/2014 2145
Bromomethane (Methyl bromide)	50	49		1	99	60-140	12/29/2014 2145
2-Butanone (MEK)	100	87		1	87	60-140	12/29/2014 2145
Carbon disulfide	50	47		1	93	60-140	12/29/2014 2145
Carbon tetrachloride	50	52		1	105	70-130	12/29/2014 2145
Chlorobenzene	50	48		1	95	70-130	12/29/2014 2145
Chloroethane	50	50		1	100	42-163	12/29/2014 2145
Chloroform	50	47		1	93	70-130	12/29/2014 2145
Chloromethane (Methyl chloride)	50	55		1	110	60-140	12/29/2014 2145
Dibromochloromethane	50	51		1	102	70-130	12/29/2014 2145
1,4-Dichlorobenzene	50	48		1	97	70-130	12/29/2014 2145
1,3-Dichlorobenzene	50	51		1	102	70-130	12/29/2014 2145
1,2-Dichlorobenzene	50	53		1	105	70-130	12/29/2014 2145
1,2-Dichloroethane	50	46		1	92	70-130	12/29/2014 2145
1,1-Dichloroethane	50	46		1	92	70-130	12/29/2014 2145
trans-1,2-Dichloroethene	50	47		1	95	70-130	12/29/2014 2145
cis-1,2-Dichloroethene	50	45		1	90	70-130	12/29/2014 2145
1,1-Dichloroethene	50	47		1	95	70-130	12/29/2014 2145
1,2-Dichloropropane	50	48		1	96	70-130	12/29/2014 2145
trans-1,3-Dichloropropene	50	49		1	98	70-130	12/29/2014 2145
cis-1,3-Dichloropropene	50	49		1	98	70-130	12/29/2014 2145
Ethylbenzene	50	49		1	97	70-130	12/29/2014 2145
2-Hexanone	100	96		1	96	60-140	12/29/2014 2145
Methyl tertiary butyl ether (MTBE)	50	47		1	94	70-130	12/29/2014 2145
4-Methyl-2-pentanone	100	96		1	96	60-140	12/29/2014 2145
Methylene chloride	50	43		1	86	70-130	12/29/2014 2145
Styrene	50	51		1	102	70-130	12/29/2014 2145
1,1,2,2-Tetrachloroethane	50	49		1	98	60-140	12/29/2014 2145
Tetrachloroethene	50	50		1	100	70-130	12/29/2014 2145
Toluene	50	49		1	98	70-130	12/29/2014 2145
1,2,4-Trichlorobenzene	50	58		1	116	70-130	12/29/2014 2145
1,1,2-Trichloroethane	50	47		1	94	70-130	12/29/2014 2145
1,1,1-Trichloroethane	50	50		1	99	70-130	12/29/2014 2145
Trichloroethene	50	48		1	96	70-130	12/29/2014 2145
Vinyl chloride	50	52		1	104	70-130	12/29/2014 2145
Xylenes (total)	100	98		1	98	70-130	12/29/2014 2145

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		100	70-130
1,2-Dichloroethane-d4		102	70-130
Toluene-d8		106	70-130

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ64324-001
Batch: 64324
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/L	12/31/2014 0007
Benzene	ND		1	1.0	0.13	ug/L	12/31/2014 0007
Bromodichloromethane	ND		1	1.0	0.33	ug/L	12/31/2014 0007
Bromoform	ND		1	1.0	0.66	ug/L	12/31/2014 0007
Bromomethane (Methyl bromide)	ND		1	2.0	0.80	ug/L	12/31/2014 0007
2-Butanone (MEK)	ND		1	10	2.0	ug/L	12/31/2014 0007
Carbon disulfide	ND		1	1.0	0.097	ug/L	12/31/2014 0007
Carbon tetrachloride	ND		1	1.0	0.14	ug/L	12/31/2014 0007
Chlorobenzene	ND		1	2.0	0.33	ug/L	12/31/2014 0007
Chloroethane	ND		1	2.0	0.47	ug/L	12/31/2014 0007
Chloroform	ND		1	1.0	0.33	ug/L	12/31/2014 0007
Chloromethane (Methyl chloride)	ND		1	1.0	0.35	ug/L	12/31/2014 0007
Dibromochloromethane	ND		1	1.0	0.33	ug/L	12/31/2014 0007
1,3-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/31/2014 0007
1,4-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/31/2014 0007
1,2-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/31/2014 0007
1,1-Dichloroethane	ND		1	1.0	0.13	ug/L	12/31/2014 0007
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	12/31/2014 0007
trans-1,2-Dichloroethene	ND		1	1.0	0.21	ug/L	12/31/2014 0007
cis-1,2-Dichloroethene	ND		1	1.0	0.12	ug/L	12/31/2014 0007
1,1-Dichloroethene	ND		1	1.0	0.16	ug/L	12/31/2014 0007
1,2-Dichloropropane	ND		1	1.0	0.19	ug/L	12/31/2014 0007
cis-1,3-Dichloropropene	ND		1	1.0	0.092	ug/L	12/31/2014 0007
trans-1,3-Dichloropropene	ND		1	1.0	0.11	ug/L	12/31/2014 0007
Ethylbenzene	ND		1	1.0	0.33	ug/L	12/31/2014 0007
2-Hexanone	ND		1	10	0.27	ug/L	12/31/2014 0007
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	12/31/2014 0007
4-Methyl-2-pentanone	ND		1	10	0.31	ug/L	12/31/2014 0007
Methylene chloride	ND		1	1.0	0.33	ug/L	12/31/2014 0007
Styrene	ND		1	1.0	0.12	ug/L	12/31/2014 0007
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.16	ug/L	12/31/2014 0007
Tetrachloroethene	ND		1	1.0	0.13	ug/L	12/31/2014 0007
Toluene	ND		1	1.0	0.33	ug/L	12/31/2014 0007
1,2,4-Trichlorobenzene	ND		1	1.0	0.51	ug/L	12/31/2014 0007
1,1,1-Trichloroethane	ND		1	1.0	0.074	ug/L	12/31/2014 0007
1,1,2-Trichloroethane	ND		1	1.0	0.21	ug/L	12/31/2014 0007
Trichloroethene	ND		1	1.0	0.18	ug/L	12/31/2014 0007
Vinyl chloride	ND		1	1.0	0.054	ug/L	12/31/2014 0007
Xylenes (total)	ND		1	1.0	0.33	ug/L	12/31/2014 0007

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		111	70-130
1,2-Dichloroethane-d4		104	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64324-002
Batch: 64324
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	110		1	107	60-140	12/30/2014 2250
Benzene	50	47		1	93	70-130	12/30/2014 2250
Bromodichloromethane	50	47		1	95	70-130	12/30/2014 2250
Bromoform	50	51		1	101	70-130	12/30/2014 2250
Bromomethane (Methyl bromide)	50	49		1	97	60-140	12/30/2014 2250
2-Butanone (MEK)	100	99		1	99	60-140	12/30/2014 2250
Carbon disulfide	50	49		1	98	60-140	12/30/2014 2250
Carbon tetrachloride	50	47		1	95	70-130	12/30/2014 2250
Chlorobenzene	50	47		1	94	70-130	12/30/2014 2250
Chloroethane	50	50		1	100	42-163	12/30/2014 2250
Chloroform	50	46		1	92	70-130	12/30/2014 2250
Chloromethane (Methyl chloride)	50	51		1	101	60-140	12/30/2014 2250
Dibromochloromethane	50	50		1	100	70-130	12/30/2014 2250
1,3-Dichlorobenzene	50	47		1	93	70-130	12/30/2014 2250
1,4-Dichlorobenzene	50	46		1	92	70-130	12/30/2014 2250
1,2-Dichlorobenzene	50	47		1	95	70-130	12/30/2014 2250
1,1-Dichloroethane	50	47		1	95	70-130	12/30/2014 2250
1,2-Dichloroethane	50	48		1	96	70-130	12/30/2014 2250
trans-1,2-Dichloroethene	50	46		1	91	70-130	12/30/2014 2250
cis-1,2-Dichloroethene	50	46		1	92	70-130	12/30/2014 2250
1,1-Dichloroethene	50	48		1	96	70-130	12/30/2014 2250
1,2-Dichloropropane	50	48		1	96	70-130	12/30/2014 2250
cis-1,3-Dichloropropene	50	48		1	97	70-130	12/30/2014 2250
trans-1,3-Dichloropropene	50	49		1	98	70-130	12/30/2014 2250
Ethylbenzene	50	48		1	97	70-130	12/30/2014 2250
2-Hexanone	100	99		1	99	60-140	12/30/2014 2250
Methyl tertiary butyl ether (MTBE)	50	48		1	96	70-130	12/30/2014 2250
4-Methyl-2-pentanone	100	100		1	100	60-140	12/30/2014 2250
Methylene chloride	50	45		1	91	70-130	12/30/2014 2250
Styrene	50	48		1	96	70-130	12/30/2014 2250
1,1,2,2-Tetrachloroethane	50	49		1	98	60-140	12/30/2014 2250
Tetrachloroethene	50	48		1	95	70-130	12/30/2014 2250
Toluene	50	46		1	92	70-130	12/30/2014 2250
1,2,4-Trichlorobenzene	50	48		1	95	70-130	12/30/2014 2250
1,1,1-Trichloroethane	50	46		1	93	70-130	12/30/2014 2250
1,1,2-Trichloroethane	50	48		1	95	70-130	12/30/2014 2250
Trichloroethene	50	48		1	96	70-130	12/30/2014 2250
Vinyl chloride	50	50		1	100	70-130	12/30/2014 2250
Xylenes (total)	100	95		1	95	70-130	12/30/2014 2250

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		108	70-130
1,2-Dichloroethane-d4		102	70-130
Toluene-d8		104	70-130

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ63839-001
Batch: 63839
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Arsenic	ND		1	0.010	0.0040	mg/L	12/31/2014 1814
Barium	ND		1	0.025	0.0075	mg/L	12/31/2014 1814
Cadmium	ND		1	0.0020	0.00060	mg/L	12/31/2014 1814
Chromium	ND		1	0.0050	0.0021	mg/L	01/02/2015 0938
Lead	ND		1	0.010	0.0019	mg/L	12/31/2014 1814
Selenium	ND		1	0.010	0.0026	mg/L	12/31/2014 1814
Silver	ND		1	0.0050	0.00040	mg/L	12/31/2014 1814

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ63839-002
Batch: 63839
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	0.40	0.42		5	104	80-120	12/31/2014 1818
Barium	2.0	2.2		5	108	80-120	12/31/2014 1818
Cadmium	0.40	0.43		5	107	80-120	12/31/2014 1818
Chromium	2.0	2.0		1	101	80-120	01/02/2015 0942
Lead	0.40	0.44		5	111	80-120	12/31/2014 1818
Selenium	0.40	0.45		5	112	80-120	12/31/2014 1818
Silver	0.40	0.37		5	93	80-120	12/31/2014 1818

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MB

Sample ID: PQ63839-001
Batch: 63839
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Arsenic	ND		1	0.010	0.0040	mg/L	12/31/2014 1814
Dissolved Barium	ND		1	0.025	0.0075	mg/L	12/31/2014 1814
Dissolved Cadmium	ND		1	0.0020	0.00060	mg/L	12/31/2014 1814
Dissolved Chromium	ND		1	0.0050	0.0021	mg/L	01/02/2015 0938
Dissolved Lead	ND		1	0.010	0.0019	mg/L	12/31/2014 1814
Dissolved Selenium	ND		1	0.010	0.0026	mg/L	12/31/2014 1814
Dissolved Silver	ND		1	0.0050	0.00040	mg/L	12/31/2014 1814

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - LCS

Sample ID: PQ63839-002
Batch: 63839
Analytical Method: 6010C
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/23/2014 1605

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Arsenic	0.40	0.42		5	104	80-120	12/31/2014 1818
Dissolved Barium	2.0	2.2		5	108	80-120	12/31/2014 1818
Dissolved Cadmium	0.40	0.43		5	107	80-120	12/31/2014 1818
Dissolved Chromium	2.0	2.0		1	101	80-120	01/02/2015 0942
Dissolved Lead	0.40	0.44		5	111	80-120	12/31/2014 1818
Dissolved Selenium	0.40	0.45		5	112	80-120	12/31/2014 1818
Dissolved Silver	0.40	0.37		5	93	80-120	12/31/2014 1818

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ64238-001
Batch: 64238
Analytical Method: 7470A
Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	ND		1	0.00010	0.000015	mg/L	12/30/2014 1315

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ64238-002
Batch: 64238
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.0020	0.0019		1	96	85-115	12/30/2014 1317

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MS

Sample ID: PL20001-001MS
Batch: 64238
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	ND	0.0020	0.0019		1	94	85-115	12/30/2014 1320

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MSD

Sample ID: PL20001-001MD
Batch: 64238
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Mercury	ND	0.0020	0.0019		1	95	0.84	85-115	20	12/30/2014 1322

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MB

Sample ID: PQ64238-001
Batch: 64238
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Mercury	ND		1	0.00010	0.000015	mg/L	12/30/2014 1315

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - LCS

Sample ID: PQ64238-002
Batch: 64238
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Mercury	0.0020	0.0019		1	96	85-115	12/30/2014 1317

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

Chain of Custody Record

Number 43713

Client: ARCADIS	Report to Contact: Scott Bostian	Telephone No. / E-mail: Scott.Bostian@arcadis-U.com	Quote No.
Address: 801 Corporate Center Dr. #300	Sampler's Signature: X / Danny Mayo	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Raleigh State: NC Zip Code: 27607	Printed Name: Jared Fine / Danny May		PL20001
Project Name: HAA-01			

Project No.	P.O. No.	Date	Time	Grab / Composite	Matrix: Aqueous	Soil	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	S2O3 Na	VOC	RCRA 8 Metals	Hex. Chrome	Remarks / Cooler I.D.
10153001.0001.DE001																	
Sample ID / Description (Containers for each sample may be combined on one line.)																	
HA01COEMW08(121914)	12/19/14	0911	G	X			2		2	3				X	X	X	Metals Total + Dissolved
HA01MW12D(121914)		1011	G	X						3				X			
HA01MW12(121914)		1047	G	X			1		1	3				X	X	X	
HA01COEMW06(121914)		1137	G	X			1		1	3				X	X	X	
HA01MW13(121914)		0922	G	X			1		1	3				X	X	X	
HA01COEMW07(121914)		1006	G	X						3				X			
HA01MW21(121914)		1106	G	X			2		2	3				X	X	X	
HA01COEMW05(121914)		1212	G	X			1		1	3				X	X	X	
HA01COEMW04(121914)		1231	G	X			1		1	3				X	X	X	
TRIP BLANK		—	—	X						2				X			

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	12/19/14	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by FedEx	12/20/14	0240	4. Laboratory received by	12/20/14	0240

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle): (Yes) No Ice Pack
Receipt Temp. 2.3 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Level 1 Report v2.1

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 16

Page 1 of 1
Replaces Date: 07/15/14
Effective Date: 11/07/14

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: mam/11/04/14 Lot #: R120001

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☑		1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt: 1@15/2.4/2.3 °C ___/___/___°C ___/___/___°C ___/___/___°C Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: #4 IR Gun Correction Factor: 0.1 °C Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.)
Yes ☑	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐		5. Were proper custody procedures (relinquished/received) followed?
Yes ☐	No ☑	NA ☐	5a Were samples relinquished by client to commercial courier?
Yes ☑	No ☐		6. Were sample IDs listed on the COC?
Yes ☑	No ☐		7. Were sample IDs listed on all sample containers?
Yes ☑	No ☐		8. Was collection date & time listed on the COC?
Yes ☑	No ☐		9. Was collection date & time listed on all sample containers?
Yes ☑	No ☐		10. Did all container label information (ID, date, time) agree with the COC?
Yes ☑	No ☐		11. Were tests to be performed listed on the COC?
Yes ☑	No ☐		12. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐		13. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐		14. Was adequate sample volume available?
mam 11/04/14 Yes ☑	No ☑		15. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑		16. Were any samples containers missing?
Yes ☐	No ☑		17. Were there any excess samples not listed on COC?
Yes ☐	No ☑	NA ☐	18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	20. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	22. Were collection temperatures documented on the COC for NC samples?
Yes ☐	No ☐	NA ☑	23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
Yes ☐	No ☑		24. Was the quote number used taken from the container label?
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)			
Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) using SR #_____.			
Sample(s)_____ were received with bubbles >6 mm in diameter.			
Sample(s)_____ were received with TRC >0.2 mg/L (If #21 is No)			
SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____ Sample(s)_____ were not received at a pH of <2 and were adjusted accordingly using SR#			
Sample labels applied by: mam Verified by: _____ Date: 11/04/14			

Comments:

Report of Analysis

ARCADIS U.S., Inc.
30 Patewood Drive
Suite 155
Greenville, SC 29615
Attention: Rachelle Borne

Project Name: HAA-01

Project Number: 1015300.0001.DE001

Lot Number: PL24008

Date Completed: 01/08/2015



Nisreen Saikaly
Project Manager

This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

PL24008

Case Narrative
ARCADIS U.S., Inc.
Lot Number: PL24008

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Hexavalent Chromium

Samples were received outside the holding time for Hexavalent Chromium analysis.

The MS/MSD recoveries in batches 63961 and 64178 were outside acceptance criteria. All other QA/QC criteria for the batch were within acceptance criteria and method control limits. The MS/MSD recovery results are attributed to matrix interference. The associated sample results were reported and no corrective action was required.

Semivolatile Organic Compounds

LCS recovery for many compounds was outside method control limits in batch 64194. The associated sample is -004. No sample remained for re-extraction.

Sample Summary

ARCADIS U.S., Inc.

Lot Number: PL24008

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	HA01COEMW02(122314)	Aqueous	12/23/2014 0951	12/24/2014
002	HA01COEMW03(122314)	Aqueous	12/23/2014 1051	12/24/2014
003	HA01HMW14R(122314)	Aqueous	12/23/2014 1151	12/24/2014
004	HA01HMW09(122314)	Aqueous	12/23/2014 1036	12/24/2014
005	HA01MW09(122314)	Aqueous	12/23/2014 0922	12/24/2014
006	HA01HMW08(122314)	Aqueous	12/23/2014 1142	12/24/2014
007	HA01COEMW01(122214)	Aqueous	12/22/2014 1611	12/24/2014
008	HA01MW10(122214)	Aqueous	12/22/2014 1642	12/24/2014
009	HA01MW11(122214)	Aqueous	12/22/2014 1550	12/24/2014
010	TRIP BLANK	Aqueous	12/23/2014	12/24/2014

(10 samples)

Executive Summary
ARCADIS U.S., Inc.
Lot Number: PL24008

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	HA01COEMW02(122314)	Aqueous	Benzene	8260B	0.99	J	ug/L	6
001	HA01COEMW02(122314)	Aqueous	trans-1,2-Dichloroethene	8260B	2.1		ug/L	6
001	HA01COEMW02(122314)	Aqueous	cis-1,2-Dichloroethene	8260B	51		ug/L	6
001	HA01COEMW02(122314)	Aqueous	2-Hexanone	8260B	1.2	J	ug/L	6
001	HA01COEMW02(122314)	Aqueous	Vinyl chloride	8260B	0.31	J	ug/L	6
001	HA01COEMW02(122314)	Aqueous	Aldrin	8081B	0.0065	JP	ug/L	8
001	HA01COEMW02(122314)	Aqueous	gamma-BHC (Lindane)	8081B	0.0090	J	ug/L	8
001	HA01COEMW02(122314)	Aqueous	alpha-BHC	8081B	0.0032	JP	ug/L	8
001	HA01COEMW02(122314)	Aqueous	beta-BHC	8081B	0.020	JP	ug/L	8
001	HA01COEMW02(122314)	Aqueous	delta-BHC	8081B	0.013	JP	ug/L	8
001	HA01COEMW02(122314)	Aqueous	gamma-Chlordane	8081B	0.0022	JP	ug/L	8
001	HA01COEMW02(122314)	Aqueous	Endosulfan sulfate	8081B	0.010	JP	ug/L	8
001	HA01COEMW02(122314)	Aqueous	Endrin	8081B	0.0035	J	ug/L	8
001	HA01COEMW02(122314)	Aqueous	Endrin aldehyde	8081B	0.0054	BJP	ug/L	8
002	HA01COEMW03(122314)	Aqueous	Benzene	8260B	3.1	J	ug/L	10
002	HA01COEMW03(122314)	Aqueous	trans-1,2-Dichloroethene	8260B	98		ug/L	10
002	HA01COEMW03(122314)	Aqueous	cis-1,2-Dichloroethene	8260B	1900		ug/L	10
002	HA01COEMW03(122314)	Aqueous	Toluene	8260B	6.9	J	ug/L	10
002	HA01COEMW03(122314)	Aqueous	Vinyl chloride	8260B	120		ug/L	10
002	HA01COEMW03(122314)	Aqueous	Dissolved Barium	6010C	0.064		mg/L	13
002	HA01COEMW03(122314)	Aqueous	Dissolved Silver	6010C	0.00040	J	mg/L	13
002	HA01COEMW03(122314)	Aqueous	Barium	6010C	0.062		mg/L	14
002	HA01COEMW03(122314)	Aqueous	Chromium	6010C	0.0043	J	mg/L	14
002	HA01COEMW03(122314)	Aqueous	Mercury	7470A	0.000018	J	mg/L	14
002	HA01COEMW03(122314)	Aqueous	Silver	6010C	0.00066	J	mg/L	14
003	HA01HMW14R(122314)	Aqueous	trans-1,2-Dichloroethene	8260B	3.4		ug/L	15
003	HA01HMW14R(122314)	Aqueous	cis-1,2-Dichloroethene	8260B	27		ug/L	15
003	HA01HMW14R(122314)	Aqueous	Trichloroethene	8260B	0.30	J	ug/L	15
003	HA01HMW14R(122314)	Aqueous	Aldrin	8081B	0.0018	JP	ug/L	17
003	HA01HMW14R(122314)	Aqueous	gamma-BHC (Lindane)	8081B	0.0039	J	ug/L	17
003	HA01HMW14R(122314)	Aqueous	beta-BHC	8081B	0.0058	JP	ug/L	17
003	HA01HMW14R(122314)	Aqueous	delta-BHC	8081B	0.0095	JP	ug/L	17
003	HA01HMW14R(122314)	Aqueous	gamma-Chlordane	8081B	0.0018	JP	ug/L	17
003	HA01HMW14R(122314)	Aqueous	Endosulfan sulfate	8081B	0.0017	JP	ug/L	17
003	HA01HMW14R(122314)	Aqueous	Endrin aldehyde	8081B	0.0082	BJ	ug/L	17
003	HA01HMW14R(122314)	Aqueous	Heptachlor epoxide	8081B	0.0023	JP	ug/L	17
004	HA01HMW09(122314)	Aqueous	Benzene	8260B	0.44	J	ug/L	18
004	HA01HMW09(122314)	Aqueous	Ethylbenzene	8260B	0.83	J	ug/L	18
004	HA01HMW09(122314)	Aqueous	2-Methylnaphthalene	8270D	0.21	J	ug/L	20
004	HA01HMW09(122314)	Aqueous	Naphthalene	8270D	4.1		ug/L	21
005	HA01MW09(122314)	Aqueous	Toluene	8260B	1.4		ug/L	22
005	HA01MW09(122314)	Aqueous	gamma-BHC (Lindane)	8081B	0.014	J	ug/L	24
005	HA01MW09(122314)	Aqueous	alpha-BHC	8081B	0.021	JP	ug/L	24
005	HA01MW09(122314)	Aqueous	beta-BHC	8081B	0.079		ug/L	24
005	HA01MW09(122314)	Aqueous	delta-BHC	8081B	0.0061	JP	ug/L	24

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	HA01MW09(122314)	Aqueous	gamma-Chlordane	8081B	0.0028	JP	ug/L	24
005	HA01MW09(122314)	Aqueous	4,4'-DDD	8081B	0.0064	JP	ug/L	24
005	HA01MW09(122314)	Aqueous	Dieldrin	8081B	0.0032	JP	ug/L	24
005	HA01MW09(122314)	Aqueous	Endosulfan sulfate	8081B	0.0071	JP	ug/L	24
005	HA01MW09(122314)	Aqueous	Endrin	8081B	0.017	JP	ug/L	24
005	HA01MW09(122314)	Aqueous	Endrin aldehyde	8081B	0.011	BJP	ug/L	24
005	HA01MW09(122314)	Aqueous	Methoxychlor	8081B	0.021	J	ug/L	24
007	HA01COEMW01(122214)	Aqueous	cis-1,2-Dichloroethene	8260B	2.5		ug/L	27
007	HA01COEMW01(122214)	Aqueous	Aldrin	8081B	0.0080	J	ug/L	29
007	HA01COEMW01(122214)	Aqueous	gamma-BHC (Lindane)	8081B	0.0043	JP	ug/L	29
007	HA01COEMW01(122214)	Aqueous	alpha-BHC	8081B	0.0031	JP	ug/L	29
007	HA01COEMW01(122214)	Aqueous	beta-BHC	8081B	0.018	JP	ug/L	29
007	HA01COEMW01(122214)	Aqueous	delta-BHC	8081B	0.013	JP	ug/L	29
007	HA01COEMW01(122214)	Aqueous	gamma-Chlordane	8081B	0.0029	JP	ug/L	29
007	HA01COEMW01(122214)	Aqueous	Dieldrin	8081B	0.0015	J	ug/L	29
007	HA01COEMW01(122214)	Aqueous	Endrin aldehyde	8081B	0.0062	BJP	ug/L	29
007	HA01COEMW01(122214)	Aqueous	Heptachlor epoxide	8081B	0.0043	JP	ug/L	29
007	HA01COEMW01(122214)	Aqueous	Methoxychlor	8081B	0.0084	J	ug/L	29

(63 detections)

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-001
Description: HA01COEMW02(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 0951
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 0457	PMM2		64226

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	0.99	J	1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	2.1		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	51		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	1.2	J	10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	0.31	J	1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-001
Description: HA01COEMW02(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 0951
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		104	70-130
Bromofluorobenzene		110	70-130
Toluene-d8		101	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-001
Description: HA01COEMW02(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 0951
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	1	01/06/2015 1202	MEM	12/29/2014 1702	64188

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	0.0065	JP	0.025	0.0017	ug/L	1
gamma-BHC (Lindane)	58-89-9	8081B	0.0090	J	0.025	0.0011	ug/L	1
alpha-BHC	319-84-6	8081B	0.0032	JP	0.025	0.0010	ug/L	1
beta-BHC	319-85-7	8081B	0.020	JP	0.025	0.0039	ug/L	1
delta-BHC	319-86-8	8081B	0.013	JP	0.025	0.0011	ug/L	1
alpha-Chlordane	5103-71-9	8081B	ND		0.025	0.0013	ug/L	1
gamma-Chlordane	5103-74-2	8081B	0.0022	JP	0.025	0.0015	ug/L	1
4,4'-DDD	72-54-8	8081B	ND		0.025	0.0010	ug/L	1
4,4'-DDE	72-55-9	8081B	ND		0.025	0.011	ug/L	1
4,4'-DDT	50-29-3	8081B	ND		0.025	0.0020	ug/L	1
Dieldrin	60-57-1	8081B	ND		0.025	0.0010	ug/L	1
Endosulfan I	959-98-8	8081B	ND		0.025	0.0022	ug/L	1
Endosulfan II	33213-65-9	8081B	ND		0.025	0.0015	ug/L	1
Endosulfan sulfate	1031-07-8	8081B	0.010	JP	0.025	0.0011	ug/L	1
Endrin	72-20-8	8081B	0.0035	J	0.025	0.0010	ug/L	1
Endrin aldehyde	7421-93-4	8081B	0.0054	BJP	0.025	0.0019	ug/L	1
Endrin ketone	53494-70-5	8081B	ND		0.025	0.0012	ug/L	1
Heptachlor	76-44-8	8081B	ND		0.025	0.013	ug/L	1
Heptachlor epoxide	1024-57-3	8081B	ND		0.025	0.0020	ug/L	1
Methoxychlor	72-43-5	8081B	ND		0.10	0.0020	ug/L	1
Toxaphene	8001-35-2	8081B	ND		0.25	0.11	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl		47	10-122
Tetrachloro-m-xylene		59	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-002
Description: HA01COEMW03(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1051
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Hexavalent C) 7196A	1	12/24/2014 1332	BWS		63961
1		(Hexavalent C) 7196A	1	12/24/2014 1332	BLB		64178

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Hexavalent Chromium	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1
Hexavalent Chromium - Dissolved	18540-29-9	7196A	ND	H	0.020	0.0081	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-002
Description: HA01COEMW03(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1051
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	20	12/30/2014 0625	PMM2		64226

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		400	130	ug/L	1
Benzene	71-43-2	8260B	3.1	J	20	2.6	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		20	6.6	ug/L	1
Bromoform	75-25-2	8260B	ND		20	13	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		40	16	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		200	41	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		20	1.9	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		20	2.7	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		40	6.6	ug/L	1
Chloroethane	75-00-3	8260B	ND		40	9.4	ug/L	1
Chloroform	67-66-3	8260B	ND		20	6.6	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		20	7.0	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		20	6.6	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		20	6.6	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		20	6.6	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		20	6.6	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		20	2.9	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		20	2.6	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	98		20	4.1	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	1900		20	2.4	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		20	3.2	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		20	3.8	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		20	2.1	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		20	1.8	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		20	6.6	ug/L	1
2-Hexanone	591-78-6	8260B	ND		200	5.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		20	8.0	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		200	6.2	ug/L	1
Methylene chloride	75-09-2	8260B	ND		20	6.6	ug/L	1
Styrene	100-42-5	8260B	ND		20	2.4	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		20	3.3	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		20	2.6	ug/L	1
Toluene	108-88-3	8260B	6.9	J	20	6.6	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		20	10	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		20	4.2	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		20	1.5	ug/L	1
Trichloroethene	79-01-6	8260B	ND		20	3.6	ug/L	1
Vinyl chloride	75-01-4	8260B	120		20	1.1	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		20	6.6	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-002
Description: HA01COEMW03(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1051
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		103	70-130
Bromofluorobenzene		111	70-130
Toluene-d8		101	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-002
Description: HA01COEMW03(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1051
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	20	12/30/2014 0625	ALL		64417

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
1,4-Dioxane	123-91-1	8260B	ND		100	34	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		103	70-130
Bromofluorobenzene		111	70-130
Toluene-d8		101	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Dissolved RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-002
Description: HA01COEMW03(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1051
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1313	HKB	12/30/2014 0946	64240
1	3005A	6010C	1	01/01/2015 0010	RKT	12/26/2014 0912	63991

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Dissolved Barium	7440-39-3	6010C	0.064		0.025	0.0075	mg/L	1
Dissolved Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Dissolved Chromium	7440-47-3	6010C	ND		0.0050	0.0021	mg/L	1
Dissolved Lead	7439-92-1	6010C	ND		0.010	0.0019	mg/L	1
Dissolved Mercury	7439-97-6	7470A	ND		0.00010	0.000015	mg/L	1
Dissolved Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Dissolved Silver	7440-22-4	6010C	0.00040	J	0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

RCRA Metals

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-002
Description: HA01COEMW03(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1051
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	12/30/2014 1304	HKB	12/30/2014 0946	64240
1	3005A	6010C	1	01/01/2015 0005	RKT	12/26/2014 0912	63991

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Arsenic	7440-38-2	6010C	ND		0.010	0.0040	mg/L	1
Barium	7440-39-3	6010C	0.062		0.025	0.0075	mg/L	1
Cadmium	7440-43-9	6010C	ND		0.0020	0.00060	mg/L	1
Chromium	7440-47-3	6010C	0.0043	J	0.0050	0.0021	mg/L	1
Lead	7439-92-1	6010C	ND		0.010	0.0019	mg/L	1
Mercury	7439-97-6	7470A	0.000018	J	0.00010	0.000015	mg/L	1
Selenium	7782-49-2	6010C	ND		0.010	0.0026	mg/L	1
Silver	7440-22-4	6010C	0.00066	J	0.0050	0.00040	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-003
Description: HA01HMW14R(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1151
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1358	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	3.4		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	27		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	0.30	J	1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-003
Description: HA01HMW14R(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1151
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		114	70-130
Toluene-d8		103	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-003
Description: HA01HMW14R(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1151
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	1	01/06/2015 1245	MEM	12/29/2014 1702	64188

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	0.0018	JP	0.025	0.0017	ug/L	1
gamma-BHC (Lindane)	58-89-9	8081B	0.0039	J	0.025	0.0011	ug/L	1
alpha-BHC	319-84-6	8081B	ND		0.025	0.0010	ug/L	1
beta-BHC	319-85-7	8081B	0.0058	JP	0.025	0.0039	ug/L	1
delta-BHC	319-86-8	8081B	0.0095	JP	0.025	0.0011	ug/L	1
alpha-Chlordane	5103-71-9	8081B	ND		0.025	0.0013	ug/L	1
gamma-Chlordane	5103-74-2	8081B	0.0018	JP	0.025	0.0015	ug/L	1
4,4'-DDD	72-54-8	8081B	ND		0.025	0.0010	ug/L	1
4,4'-DDE	72-55-9	8081B	ND		0.025	0.011	ug/L	1
4,4'-DDT	50-29-3	8081B	ND		0.025	0.0020	ug/L	1
Dieldrin	60-57-1	8081B	ND		0.025	0.0010	ug/L	1
Endosulfan I	959-98-8	8081B	ND		0.025	0.0022	ug/L	1
Endosulfan II	33213-65-9	8081B	ND		0.025	0.0015	ug/L	1
Endosulfan sulfate	1031-07-8	8081B	0.0017	JP	0.025	0.0011	ug/L	1
Endrin	72-20-8	8081B	ND		0.025	0.0010	ug/L	1
Endrin aldehyde	7421-93-4	8081B	0.0082	BJ	0.025	0.0019	ug/L	1
Endrin ketone	53494-70-5	8081B	ND		0.025	0.0012	ug/L	1
Heptachlor	76-44-8	8081B	ND		0.025	0.013	ug/L	1
Heptachlor epoxide	1024-57-3	8081B	0.0023	JP	0.025	0.0020	ug/L	1
Methoxychlor	72-43-5	8081B	ND		0.10	0.0020	ug/L	1
Toxaphene	8001-35-2	8081B	ND		0.25	0.11	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl		51	10-122
Tetrachloro-m-xylene		65	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-004
Description: HA01HMW09(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1036
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1420	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	0.44	J	1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	0.83	J	1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-004
Description: HA01HMW09(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1036
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		100	70-130
Bromofluorobenzene		108	70-130
Toluene-d8		99	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-004
Description: HA01HMW09(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1036
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	01/02/2015 1517	DRB1	12/29/2014 1637	64194

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acenaphthene	83-32-9	8270D	ND		1.0	0.090	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		1.0	0.16	ug/L	1
Anthracene	120-12-7	8270D	ND		1.0	0.13	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		1.0	0.15	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		1.0	0.16	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		1.0	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		1.0	0.23	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		1.0	0.12	ug/L	1
4-Bromophenyl phenyl ether	101-55-3	8270D	ND		1.0	0.12	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		5.0	1.7	ug/L	1
Carbazole	86-74-8	8270D	ND		1.0	0.25	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		1.0	0.22	ug/L	1
4-Chloroaniline	106-47-8	8270D	ND		1.0	0.13	ug/L	1
bis(2-Chloroethoxy)methane	111-91-1	8270D	ND		1.0	0.13	ug/L	1
bis(2-Chloroisopropyl)ether	108-60-1	8270D	ND		1.0	0.080	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		1.0	0.12	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		1.0	0.13	ug/L	1
4-Chlorophenyl phenyl ether	7005-72-3	8270D	ND		1.0	0.11	ug/L	1
Chrysene	218-01-9	8270D	ND		1.0	0.12	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		1.0	0.13	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		1.0	0.16	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		5.0	0.81	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.0	0.15	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		5.0	1.7	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		5.0	1.7	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		1.0	0.31	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		5.0	1.7	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		5.0	1.5	ug/L	1
2,4-Dinitrophenol	51-28-5	8270D	ND		5.0	0.25	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		2.0	0.45	ug/L	1
2,6-Dinitrotoluene	606-20-2	8270D	ND		2.0	0.40	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		5.0	1.7	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		5.0	1.7	ug/L	1
Fluoranthene	206-44-0	8270D	ND		1.0	0.21	ug/L	1
Fluorene	86-73-7	8270D	ND		1.0	0.10	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		1.0	0.21	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		1.0	0.090	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		5.0	0.23	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		1.0	0.11	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		1.0	0.23	ug/L	1
Isophorone	78-59-1	8270D	ND		1.0	0.080	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	0.21	J	1.0	0.080	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		1.0	0.17	ug/L	1
3 & 4-Methylphenol	106-44-5	8270D	ND		2.0	0.57	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Semivolatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-004
Description: HA01HMW09(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1036
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	01/02/2015 1517	DRB1	12/29/2014 1637	64194

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Naphthalene	91-20-3	8270D	4.1		1.0	0.070	ug/L	1
2-Nitroaniline	88-74-4	8270D	ND		2.0	0.55	ug/L	1
3-Nitroaniline	99-09-2	8270D	ND		2.0	0.77	ug/L	1
4-Nitroaniline	100-01-6	8270D	ND		2.0	0.39	ug/L	1
Nitrobenzene	98-95-3	8270D	ND		1.0	0.10	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		2.0	0.27	ug/L	1
4-Nitrophenol	100-02-7	8270D	ND		5.0	0.64	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		1.0	0.080	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		1.0	0.38	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		5.0	0.54	ug/L	1
Phenanthrene	85-01-8	8270D	ND		1.0	0.18	ug/L	1
Phenol	108-95-2	8270D	ND		1.0	0.11	ug/L	1
Pyrene	129-00-0	8270D	ND		1.0	0.16	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		1.0	0.18	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		1.0	0.22	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		106	37-129
2-Fluorophenol		92	24-127
Nitrobenzene-d5		89	38-127
Phenol-d5		95	28-128
Terphenyl-d14		106	10-148
2,4,6-Tribromophenol		112	41-144

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-005
Description: HA01MW09(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 0922
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1442	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	1.4		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-005
Description: HA01MW09(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 0922
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		111	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-005
Description: HA01MW09(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 0922
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	1	01/06/2015 1259	MEM	12/29/2014 1702	64188

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	ND		0.025	0.0017	ug/L	1
gamma-BHC (Lindane)	58-89-9	8081B	0.014	J	0.025	0.0011	ug/L	1
alpha-BHC	319-84-6	8081B	0.021	JP	0.025	0.0010	ug/L	1
beta-BHC	319-85-7	8081B	0.079		0.025	0.0039	ug/L	1
delta-BHC	319-86-8	8081B	0.0061	JP	0.025	0.0011	ug/L	1
alpha-Chlordane	5103-71-9	8081B	ND		0.025	0.0013	ug/L	1
gamma-Chlordane	5103-74-2	8081B	0.0028	JP	0.025	0.0015	ug/L	1
4,4'-DDD	72-54-8	8081B	0.0064	JP	0.025	0.0010	ug/L	1
4,4'-DDE	72-55-9	8081B	ND		0.025	0.011	ug/L	1
4,4'-DDT	50-29-3	8081B	ND		0.025	0.0020	ug/L	1
Dieldrin	60-57-1	8081B	0.0032	JP	0.025	0.0010	ug/L	1
Endosulfan I	959-98-8	8081B	ND		0.025	0.0022	ug/L	1
Endosulfan II	33213-65-9	8081B	ND		0.025	0.0015	ug/L	1
Endosulfan sulfate	1031-07-8	8081B	0.0071	JP	0.025	0.0011	ug/L	1
Endrin	72-20-8	8081B	0.017	JP	0.025	0.0010	ug/L	1
Endrin aldehyde	7421-93-4	8081B	0.011	BJP	0.025	0.0019	ug/L	1
Endrin ketone	53494-70-5	8081B	ND		0.025	0.0012	ug/L	1
Heptachlor	76-44-8	8081B	ND		0.025	0.013	ug/L	1
Heptachlor epoxide	1024-57-3	8081B	ND		0.025	0.0020	ug/L	1
Methoxychlor	72-43-5	8081B	0.021	J	0.10	0.0020	ug/L	1
Toxaphene	8001-35-2	8081B	ND		0.25	0.11	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl		49	10-122
Tetrachloro-m-xylene		76	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-006
Description: HA01HMW08(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1142
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1503	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-006
Description: HA01HMW08(122314)
Matrix: Aqueous
Date Sampled: 12/23/2014 1142
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		100	70-130
Bromofluorobenzene		106	70-130
Toluene-d8		99	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-007
Description: HA01COEMW01(122214)
Matrix: Aqueous
Date Sampled: 12/22/2014 1611
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1525	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	2.5		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-007
Description: HA01COEMW01(122214)
Matrix: Aqueous
Date Sampled: 12/22/2014 1611
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		110	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Organochlorine Pesticides by GC

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-007
Description: HA01COEMW01(122214)
Matrix: Aqueous
Date Sampled: 12/22/2014 1611
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8081B	1	01/06/2015 1314	MEM	12/29/2014 1702	64188

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Aldrin	309-00-2	8081B	0.0080	J	0.025	0.0017	ug/L	1
gamma-BHC (Lindane)	58-89-9	8081B	0.0043	JP	0.025	0.0011	ug/L	1
alpha-BHC	319-84-6	8081B	0.0031	JP	0.025	0.0010	ug/L	1
beta-BHC	319-85-7	8081B	0.018	JP	0.025	0.0039	ug/L	1
delta-BHC	319-86-8	8081B	0.013	JP	0.025	0.0011	ug/L	1
alpha-Chlordane	5103-71-9	8081B	ND		0.025	0.0013	ug/L	1
gamma-Chlordane	5103-74-2	8081B	0.0029	JP	0.025	0.0015	ug/L	1
4,4'-DDD	72-54-8	8081B	ND		0.025	0.0010	ug/L	1
4,4'-DDE	72-55-9	8081B	ND		0.025	0.011	ug/L	1
4,4'-DDT	50-29-3	8081B	ND		0.025	0.0020	ug/L	1
Dieldrin	60-57-1	8081B	0.0015	J	0.025	0.0010	ug/L	1
Endosulfan I	959-98-8	8081B	ND		0.025	0.0022	ug/L	1
Endosulfan II	33213-65-9	8081B	ND		0.025	0.0015	ug/L	1
Endosulfan sulfate	1031-07-8	8081B	ND		0.025	0.0011	ug/L	1
Endrin	72-20-8	8081B	ND		0.025	0.0010	ug/L	1
Endrin aldehyde	7421-93-4	8081B	0.0062	BJP	0.025	0.0019	ug/L	1
Endrin ketone	53494-70-5	8081B	ND		0.025	0.0012	ug/L	1
Heptachlor	76-44-8	8081B	ND		0.025	0.013	ug/L	1
Heptachlor epoxide	1024-57-3	8081B	0.0043	JP	0.025	0.0020	ug/L	1
Methoxychlor	72-43-5	8081B	0.0084	J	0.10	0.0020	ug/L	1
Toxaphene	8001-35-2	8081B	ND		0.25	0.11	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl		49	10-122
Tetrachloro-m-xylene		65	46-119

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-008
Description: HA01MW10(122214)
Matrix: Aqueous
Date Sampled: 12/22/2014 1642
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1546	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-008
Description: HA01MW10(122214)
Matrix: Aqueous
Date Sampled: 12/22/2014 1642
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		103	70-130
Bromofluorobenzene		108	70-130
Toluene-d8		101	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-009
Description: HA01MW11(122214)
Matrix: Aqueous
Date Sampled: 12/22/2014 1550
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1608	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-009
Description: HA01MW11(122214)
Matrix: Aqueous
Date Sampled: 12/22/2014 1550
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		104	70-130
Bromofluorobenzene		108	70-130
Toluene-d8		101	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-010
Description: TRIP BLANK
Matrix: Aqueous
Date Sampled: 12/23/2014
Date Received: 12/24/2014

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	12/30/2014 1337	PAP		64288

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	6.7	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.33	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.66	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.80	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.097	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.14	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		2.0	0.33	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.47	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.33	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.35	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.33	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.33	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.13	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.21	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.12	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.16	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.19	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.11	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.092	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.27	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.31	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.33	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.12	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.16	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.13	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.51	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.21	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.074	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.18	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.054	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: PL24008-010
Description: TRIP BLANK
Matrix: Aqueous
Date Sampled: 12/23/2014
Date Received: 12/24/2014

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		101	70-130
Bromofluorobenzene		105	70-130
Toluene-d8		98	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

QC Summary

Inorganic non-metals - MB

Sample ID: PQ63961-001
Batch: 63961
Analytical Method: 7196A

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Hexavalent Chromium	ND		1	0.020	0.0081	mg/L	12/24/2014 1332

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: PQ63961-002
Batch: 63961
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	0.10	0.090		1	90	90-110	12/24/2014 1332

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL24008-002MS
Batch: 63961
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium	ND	0.10	ND	N	1	0.00	75-125	12/24/2014 1332

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: PL24008-002MD
Batch: 63961
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Hexavalent Chromium	ND	0.10	ND	N	1	0.00	0.00	75-125	20	12/24/2014 1332

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: PQ64178-001
Batch: 64178
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Hexavalent Chromium - Dissolved	ND		1	0.020	0.0081	mg/L	12/24/2014 1332

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: PQ64178-002
Batch: 64178
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium - Dissolved	0.10	0.090		1	90	90-110	12/24/2014 1332

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: PL24008-002MS
Batch: 64178
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexavalent Chromium - Dissolved	ND	0.10	0.0019	N	1	1.9	75-125	12/24/2014 1332

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: PL24008-002MD
Batch: 64178
Analytical Method: 7196A
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Hexavalent Chromium - Dissolved	ND	0.10	0.0018	N	1	1.8	5.6	75-125	20	12/24/2014 1332

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ64226-001
Batch: 64226
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/L	12/29/2014 2309
Benzene	ND		1	1.0	0.13	ug/L	12/29/2014 2309
Bromodichloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 2309
Bromoform	ND		1	1.0	0.66	ug/L	12/29/2014 2309
Bromomethane (Methyl bromide)	ND		1	2.0	0.80	ug/L	12/29/2014 2309
2-Butanone (MEK)	ND		1	10	2.0	ug/L	12/29/2014 2309
Carbon disulfide	ND		1	1.0	0.097	ug/L	12/29/2014 2309
Carbon tetrachloride	ND		1	1.0	0.14	ug/L	12/29/2014 2309
Chlorobenzene	ND		1	2.0	0.33	ug/L	12/29/2014 2309
Chloroethane	ND		1	2.0	0.47	ug/L	12/29/2014 2309
Chloroform	ND		1	1.0	0.33	ug/L	12/29/2014 2309
Chloromethane (Methyl chloride)	ND		1	1.0	0.35	ug/L	12/29/2014 2309
Dibromochloromethane	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,3-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,4-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,2-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	12/29/2014 2309
1,1-Dichloroethane	ND		1	1.0	0.13	ug/L	12/29/2014 2309
cis-1,2-Dichloroethene	ND		1	1.0	0.12	ug/L	12/29/2014 2309
trans-1,2-Dichloroethene	ND		1	1.0	0.21	ug/L	12/29/2014 2309
1,1-Dichloroethene	ND		1	1.0	0.16	ug/L	12/29/2014 2309
1,2-Dichloropropane	ND		1	1.0	0.19	ug/L	12/29/2014 2309
trans-1,3-Dichloropropene	ND		1	1.0	0.11	ug/L	12/29/2014 2309
cis-1,3-Dichloropropene	ND		1	1.0	0.092	ug/L	12/29/2014 2309
Ethylbenzene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
2-Hexanone	ND		1	10	0.27	ug/L	12/29/2014 2309
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	12/29/2014 2309
4-Methyl-2-pentanone	ND		1	10	0.31	ug/L	12/29/2014 2309
Methylene chloride	ND		1	1.0	0.33	ug/L	12/29/2014 2309
Styrene	ND		1	1.0	0.12	ug/L	12/29/2014 2309
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.16	ug/L	12/29/2014 2309
Tetrachloroethene	ND		1	1.0	0.13	ug/L	12/29/2014 2309
Toluene	ND		1	1.0	0.33	ug/L	12/29/2014 2309
1,2,4-Trichlorobenzene	ND		1	1.0	0.51	ug/L	12/29/2014 2309
1,1,1-Trichloroethane	ND		1	1.0	0.074	ug/L	12/29/2014 2309
1,1,2-Trichloroethane	ND		1	1.0	0.21	ug/L	12/29/2014 2309
Trichloroethene	ND		1	1.0	0.18	ug/L	12/29/2014 2309
Vinyl chloride	ND		1	1.0	0.054	ug/L	12/29/2014 2309
Xylenes (total)	ND		1	1.0	0.33	ug/L	12/29/2014 2309

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		109	70-130
1,2-Dichloroethane-d4		103	70-130
Toluene-d8		100	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64226-002
Batch: 64226
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	110		1	106	60-140	12/29/2014 2149
Benzene	50	45		1	90	70-130	12/29/2014 2149
Bromodichloromethane	50	47		1	94	70-130	12/29/2014 2149
Bromoform	50	51		1	103	70-130	12/29/2014 2149
Bromomethane (Methyl bromide)	50	53		1	107	60-140	12/29/2014 2149
2-Butanone (MEK)	100	100		1	100	60-140	12/29/2014 2149
Carbon disulfide	50	49		1	99	60-140	12/29/2014 2149
Carbon tetrachloride	50	47		1	95	70-130	12/29/2014 2149
Chlorobenzene	50	47		1	93	70-130	12/29/2014 2149
Chloroethane	50	55		1	109	42-163	12/29/2014 2149
Chloroform	50	46		1	93	70-130	12/29/2014 2149
Chloromethane (Methyl chloride)	50	56		1	112	60-140	12/29/2014 2149
Dibromochloromethane	50	49		1	98	70-130	12/29/2014 2149
1,3-Dichlorobenzene	50	47		1	94	70-130	12/29/2014 2149
1,4-Dichlorobenzene	50	47		1	94	70-130	12/29/2014 2149
1,2-Dichlorobenzene	50	48		1	96	70-130	12/29/2014 2149
1,2-Dichloroethane	50	49		1	98	70-130	12/29/2014 2149
1,1-Dichloroethane	50	47		1	94	70-130	12/29/2014 2149
cis-1,2-Dichloroethene	50	46		1	92	70-130	12/29/2014 2149
trans-1,2-Dichloroethene	50	45		1	90	70-130	12/29/2014 2149
1,1-Dichloroethene	50	47		1	95	70-130	12/29/2014 2149
1,2-Dichloropropane	50	47		1	94	70-130	12/29/2014 2149
trans-1,3-Dichloropropene	50	48		1	97	70-130	12/29/2014 2149
cis-1,3-Dichloropropene	50	48		1	95	70-130	12/29/2014 2149
Ethylbenzene	50	48		1	96	70-130	12/29/2014 2149
2-Hexanone	100	100		1	101	60-140	12/29/2014 2149
Methyl tertiary butyl ether (MTBE)	50	48		1	97	70-130	12/29/2014 2149
4-Methyl-2-pentanone	100	100		1	101	60-140	12/29/2014 2149
Methylene chloride	50	45		1	90	70-130	12/29/2014 2149
Styrene	50	48		1	97	70-130	12/29/2014 2149
1,1,2,2-Tetrachloroethane	50	51		1	101	60-140	12/29/2014 2149
Tetrachloroethene	50	47		1	93	70-130	12/29/2014 2149
Toluene	50	45		1	90	70-130	12/29/2014 2149
1,2,4-Trichlorobenzene	50	50		1	100	70-130	12/29/2014 2149
1,1,1-Trichloroethane	50	47		1	94	70-130	12/29/2014 2149
1,1,2-Trichloroethane	50	48		1	96	70-130	12/29/2014 2149
Trichloroethene	50	46		1	91	70-130	12/29/2014 2149
Vinyl chloride	50	55		1	109	70-130	12/29/2014 2149
Xylenes (total)	100	95		1	95	70-130	12/29/2014 2149

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		107	70-130
1,2-Dichloroethane-d4		101	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MS

Sample ID: PL24008-002MS
Batch: 64226
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	ND	2000	1700		20	85	60-140	12/30/2014 0647
Benzene	3.1	1000	960		20	96	72-127	12/30/2014 0647
Bromodichloromethane	ND	1000	970		20	97	71-143	12/30/2014 0647
Bromoform	ND	1000	1000		20	102	65-131	12/30/2014 0647
Bromomethane (Methyl bromide)	ND	1000	1100		20	112	36-168	12/30/2014 0647
2-Butanone (MEK)	ND	2000	1900		20	96	60-140	12/30/2014 0647
Carbon disulfide	ND	1000	1100		20	105	60-140	12/30/2014 0647
Carbon tetrachloride	ND	1000	1000		20	101	37-166	12/30/2014 0647
Chlorobenzene	ND	1000	970		20	97	78-129	12/30/2014 0647
Chloroethane	ND	1000	1200		20	117	60-140	12/30/2014 0647
Chloroform	ND	1000	960		20	96	63-123	12/30/2014 0647
Chloromethane (Methyl chloride)	ND	1000	1200		20	119	20-158	12/30/2014 0647
Dibromochloromethane	ND	1000	1000		20	101	74-134	12/30/2014 0647
1,4-Dichlorobenzene	ND	1000	990		20	99	70-130	12/30/2014 0647
1,3-Dichlorobenzene	ND	1000	990		20	99	70-130	12/30/2014 0647
1,2-Dichlorobenzene	ND	1000	1000		20	101	70-130	12/30/2014 0647
1,2-Dichloroethane	ND	1000	990		20	99	59-143	12/30/2014 0647
1,1-Dichloroethane	ND	1000	990		20	99	69-132	12/30/2014 0647
trans-1,2-Dichloroethene	98	1000	1100		20	96	67-141	12/30/2014 0647
cis-1,2-Dichloroethene	1900	1000	2800		20	91	70-130	12/30/2014 0647
1,1-Dichloroethene	ND	1000	1000		20	102	50-132	12/30/2014 0647
1,2-Dichloropropane	ND	1000	990		20	99	71-126	12/30/2014 0647
trans-1,3-Dichloropropene	ND	1000	970		20	97	73-131	12/30/2014 0647
cis-1,3-Dichloropropene	ND	1000	960		20	96	69-130	12/30/2014 0647
Ethylbenzene	ND	1000	1000		20	102	79-132	12/30/2014 0647
2-Hexanone	ND	2000	2000		20	100	60-140	12/30/2014 0647
Methyl tertiary butyl ether (MTBE)	ND	1000	980		20	98	60-140	12/30/2014 0647
4-Methyl-2-pentanone	ND	2000	2000		20	102	60-140	12/30/2014 0647
Methylene chloride	ND	1000	930		20	93	69-129	12/30/2014 0647
Styrene	ND	1000	1000		20	101	70-130	12/30/2014 0647
1,1,2,2-Tetrachloroethane	ND	1000	1000		20	104	60-155	12/30/2014 0647
Tetrachloroethene	ND	1000	990		20	99	70-130	12/30/2014 0647
Toluene	6.9	1000	950		20	94	75-125	12/30/2014 0647
1,2,4-Trichlorobenzene	ND	1000	1000		20	100	70-130	12/30/2014 0647
1,1,2-Trichloroethane	ND	1000	990		20	99	77-132	12/30/2014 0647
1,1,1-Trichloroethane	ND	1000	1000		20	101	77-132	12/30/2014 0647
Trichloroethene	ND	1000	970		20	97	73-124	12/30/2014 0647
Vinyl chloride	120	1000	1300		20	116	29-159	12/30/2014 0647
Xylenes (total)	ND	2000	2000		20	100	70-130	12/30/2014 0647

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		105	70-130
Bromofluorobenzene		111	70-130
Toluene-d8		106	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MSD

Sample ID: PL24008-002MD
Batch: 64226
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Acetone	ND	2000	1700		20	83	2.7	60-140	20	12/30/2014 0709
Benzene	3.1	1000	950		20	95	1.1	72-127	20	12/30/2014 0709
Bromodichloromethane	ND	1000	960		20	96	0.84	71-143	20	12/30/2014 0709
Bromoform	ND	1000	1000		20	103	1.1	65-131	20	12/30/2014 0709
Bromomethane (Methyl bromide)	ND	1000	1100		20	114	1.4	36-168	20	12/30/2014 0709
2-Butanone (MEK)	ND	2000	1900		20	94	2.4	60-140	20	12/30/2014 0709
Carbon disulfide	ND	1000	1000		20	104	0.81	60-140	20	12/30/2014 0709
Carbon tetrachloride	ND	1000	1000		20	102	0.58	37-166	20	12/30/2014 0709
Chlorobenzene	ND	1000	970		20	97	0.10	78-129	20	12/30/2014 0709
Chloroethane	ND	1000	1200		20	117	0.11	60-140	20	12/30/2014 0709
Chloroform	ND	1000	970		20	97	0.96	63-123	20	12/30/2014 0709
Chloromethane (Methyl chloride)	ND	1000	1200		20	119	0.37	20-158	20	12/30/2014 0709
Dibromochloromethane	ND	1000	1000		20	100	1.1	74-134	20	12/30/2014 0709
1,4-Dichlorobenzene	ND	1000	960		20	96	2.5	70-130	20	12/30/2014 0709
1,3-Dichlorobenzene	ND	1000	970		20	97	2.3	70-130	20	12/30/2014 0709
1,2-Dichlorobenzene	ND	1000	990		20	99	1.9	70-130	20	12/30/2014 0709
1,2-Dichloroethane	ND	1000	990		20	99	0.24	59-143	20	12/30/2014 0709
1,1-Dichloroethane	ND	1000	1000		20	100	1.1	69-132	20	12/30/2014 0709
trans-1,2-Dichloroethene	98	1000	1100		20	96	0.32	67-141	20	12/30/2014 0709
cis-1,2-Dichloroethene	1900	1000	2800		20	88	1.1	70-130	20	12/30/2014 0709
1,1-Dichloroethene	ND	1000	1000		20	100	1.8	50-132	20	12/30/2014 0709
1,2-Dichloropropane	ND	1000	980		20	98	1.5	71-126	20	12/30/2014 0709
trans-1,3-Dichloropropene	ND	1000	970		20	97	0.67	73-131	20	12/30/2014 0709
cis-1,3-Dichloropropene	ND	1000	950		20	95	1.6	69-130	20	12/30/2014 0709
Ethylbenzene	ND	1000	1000		20	100	1.6	79-132	20	12/30/2014 0709
2-Hexanone	ND	2000	2000		20	98	1.9	60-140	20	12/30/2014 0709
Methyl tertiary butyl ether (MTBE)	ND	1000	970		20	97	0.69	60-140	20	12/30/2014 0709
4-Methyl-2-pentanone	ND	2000	2000		20	99	3.3	60-140	20	12/30/2014 0709
Methylene chloride	ND	1000	930		20	93	0.52	69-129	20	12/30/2014 0709
Styrene	ND	1000	1000		20	100	0.78	70-130	20	12/30/2014 0709
1,1,2,2-Tetrachloroethane	ND	1000	1000		20	102	2.6	60-155	20	12/30/2014 0709
Tetrachloroethene	ND	1000	980		20	98	1.7	70-130	20	12/30/2014 0709
Toluene	6.9	1000	940		20	93	0.98	75-125	20	12/30/2014 0709
1,2,4-Trichlorobenzene	ND	1000	1000		20	100	0.083	70-130	20	12/30/2014 0709
1,1,2-Trichloroethane	ND	1000	980		20	98	0.93	77-132	20	12/30/2014 0709
1,1,1-Trichloroethane	ND	1000	1000		20	101	0.11	77-132	20	12/30/2014 0709
Trichloroethene	ND	1000	960		20	96	1.0	73-124	20	12/30/2014 0709
Vinyl chloride	120	1000	1300		20	115	0.45	29-159	20	12/30/2014 0709
Xylenes (total)	ND	2000	2000		20	98	1.4	70-130	20	12/30/2014 0709

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		103	70-130
Bromofluorobenzene		111	70-130
Toluene-d8		104	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ64288-001
Batch: 64288
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	6.7	ug/L	12/30/2014 1212
Benzene	ND		1	1.0	0.13	ug/L	12/30/2014 1212
Bromodichloromethane	ND		1	1.0	0.33	ug/L	12/30/2014 1212
Bromoform	ND		1	1.0	0.66	ug/L	12/30/2014 1212
Bromomethane (Methyl bromide)	ND		1	2.0	0.80	ug/L	12/30/2014 1212
2-Butanone (MEK)	ND		1	10	2.0	ug/L	12/30/2014 1212
Carbon disulfide	ND		1	1.0	0.097	ug/L	12/30/2014 1212
Carbon tetrachloride	ND		1	1.0	0.14	ug/L	12/30/2014 1212
Chlorobenzene	ND		1	2.0	0.33	ug/L	12/30/2014 1212
Chloroethane	ND		1	2.0	0.47	ug/L	12/30/2014 1212
Chloroform	ND		1	1.0	0.33	ug/L	12/30/2014 1212
Chloromethane (Methyl chloride)	ND		1	1.0	0.35	ug/L	12/30/2014 1212
Dibromochloromethane	ND		1	1.0	0.33	ug/L	12/30/2014 1212
1,4-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/30/2014 1212
1,3-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/30/2014 1212
1,2-Dichlorobenzene	ND		1	1.0	0.33	ug/L	12/30/2014 1212
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	12/30/2014 1212
1,1-Dichloroethane	ND		1	1.0	0.13	ug/L	12/30/2014 1212
trans-1,2-Dichloroethene	ND		1	1.0	0.21	ug/L	12/30/2014 1212
cis-1,2-Dichloroethene	ND		1	1.0	0.12	ug/L	12/30/2014 1212
1,1-Dichloroethene	ND		1	1.0	0.16	ug/L	12/30/2014 1212
1,2-Dichloropropane	ND		1	1.0	0.19	ug/L	12/30/2014 1212
trans-1,3-Dichloropropene	ND		1	1.0	0.11	ug/L	12/30/2014 1212
cis-1,3-Dichloropropene	ND		1	1.0	0.092	ug/L	12/30/2014 1212
Ethylbenzene	ND		1	1.0	0.33	ug/L	12/30/2014 1212
2-Hexanone	ND		1	10	0.27	ug/L	12/30/2014 1212
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	12/30/2014 1212
4-Methyl-2-pentanone	ND		1	10	0.31	ug/L	12/30/2014 1212
Methylene chloride	ND		1	1.0	0.33	ug/L	12/30/2014 1212
Styrene	ND		1	1.0	0.12	ug/L	12/30/2014 1212
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.16	ug/L	12/30/2014 1212
Tetrachloroethene	ND		1	1.0	0.13	ug/L	12/30/2014 1212
Toluene	ND		1	1.0	0.33	ug/L	12/30/2014 1212
1,2,4-Trichlorobenzene	ND		1	1.0	0.51	ug/L	12/30/2014 1212
1,1,2-Trichloroethane	ND		1	1.0	0.21	ug/L	12/30/2014 1212
1,1,1-Trichloroethane	ND		1	1.0	0.074	ug/L	12/30/2014 1212
Trichloroethene	ND		1	1.0	0.18	ug/L	12/30/2014 1212
Vinyl chloride	ND		1	1.0	0.054	ug/L	12/30/2014 1212
Xylenes (total)	ND		1	1.0	0.33	ug/L	12/30/2014 1212

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		115	70-130
1,2-Dichloroethane-d4		105	70-130
Toluene-d8		104	70-130

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64288-002
Batch: 64288
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	110		1	109	60-140	12/30/2014 1111
Benzene	50	49		1	97	70-130	12/30/2014 1111
Bromodichloromethane	50	50		1	99	70-130	12/30/2014 1111
Bromoform	50	53		1	107	70-130	12/30/2014 1111
Bromomethane (Methyl bromide)	50	53		1	105	60-140	12/30/2014 1111
2-Butanone (MEK)	100	110		1	105	60-140	12/30/2014 1111
Carbon disulfide	50	52		1	105	60-140	12/30/2014 1111
Carbon tetrachloride	50	51		1	102	70-130	12/30/2014 1111
Chlorobenzene	50	49		1	97	70-130	12/30/2014 1111
Chloroethane	50	54		1	108	42-163	12/30/2014 1111
Chloroform	50	50		1	99	70-130	12/30/2014 1111
Chloromethane (Methyl chloride)	50	53		1	105	60-140	12/30/2014 1111
Dibromochloromethane	50	51		1	103	70-130	12/30/2014 1111
1,4-Dichlorobenzene	50	49		1	97	70-130	12/30/2014 1111
1,3-Dichlorobenzene	50	49		1	98	70-130	12/30/2014 1111
1,2-Dichlorobenzene	50	49		1	99	70-130	12/30/2014 1111
1,2-Dichloroethane	50	51		1	103	70-130	12/30/2014 1111
1,1-Dichloroethane	50	50		1	100	70-130	12/30/2014 1111
trans-1,2-Dichloroethene	50	48		1	96	70-130	12/30/2014 1111
cis-1,2-Dichloroethene	50	49		1	99	70-130	12/30/2014 1111
1,1-Dichloroethene	50	51		1	101	70-130	12/30/2014 1111
1,2-Dichloropropane	50	50		1	100	70-130	12/30/2014 1111
trans-1,3-Dichloropropene	50	51		1	102	70-130	12/30/2014 1111
cis-1,3-Dichloropropene	50	51		1	102	70-130	12/30/2014 1111
Ethylbenzene	50	51		1	101	70-130	12/30/2014 1111
2-Hexanone	100	100		1	102	60-140	12/30/2014 1111
Methyl tertiary butyl ether (MTBE)	50	51		1	103	70-130	12/30/2014 1111
4-Methyl-2-pentanone	100	100		1	104	60-140	12/30/2014 1111
Methylene chloride	50	48		1	96	70-130	12/30/2014 1111
Styrene	50	50		1	101	70-130	12/30/2014 1111
1,1,2,2-Tetrachloroethane	50	51		1	101	60-140	12/30/2014 1111
Tetrachloroethene	50	50		1	99	70-130	12/30/2014 1111
Toluene	50	48		1	97	70-130	12/30/2014 1111
1,2,4-Trichlorobenzene	50	50		1	101	70-130	12/30/2014 1111
1,1,2-Trichloroethane	50	50		1	99	70-130	12/30/2014 1111
1,1,1-Trichloroethane	50	51		1	101	70-130	12/30/2014 1111
Trichloroethene	50	50		1	100	70-130	12/30/2014 1111
Vinyl chloride	50	53		1	106	70-130	12/30/2014 1111
Xylenes (total)	100	100		1	100	70-130	12/30/2014 1111

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		107	70-130
1,2-Dichloroethane-d4		102	70-130
Toluene-d8		104	70-130

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ64417-001
Batch: 64417
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
1,4-Dioxane	ND		1	5.0	1.7	ug/L	12/29/2014 2309

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		109	70-130
1,2-Dichloroethane-d4		103	70-130
Toluene-d8		100	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64417-002
Batch: 64417
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
1,4-Dioxane	500	470		1	94	43-173	12/29/2014 2149

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		107	70-130
1,2-Dichloroethane-d4		101	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ64194-001
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
2,4,5-Trichlorophenol	ND		1	1.0	0.18	ug/L	01/02/2015 1431
2,4,6-Trichlorophenol	ND		1	1.0	0.22	ug/L	01/02/2015 1431
2,4-Dichlorophenol	ND		1	1.0	0.15	ug/L	01/02/2015 1431
2,4-Dimethylphenol	ND		1	1.0	0.31	ug/L	01/02/2015 1431
2,4-Dinitrophenol	ND		1	5.0	0.25	ug/L	01/02/2015 1431
2,4-Dinitrotoluene	ND		1	2.0	0.45	ug/L	01/02/2015 1431
2,6-Dinitrotoluene	ND		1	2.0	0.40	ug/L	01/02/2015 1431
2-Chloronaphthalene	ND		1	1.0	0.12	ug/L	01/02/2015 1431
2-Chlorophenol	ND		1	1.0	0.13	ug/L	01/02/2015 1431
2-Methylnaphthalene	ND		1	1.0	0.080	ug/L	01/02/2015 1431
2-Methylphenol	ND		1	1.0	0.17	ug/L	01/02/2015 1431
2-Nitroaniline	ND		1	2.0	0.55	ug/L	01/02/2015 1431
2-Nitrophenol	ND		1	2.0	0.27	ug/L	01/02/2015 1431
3 & 4-Methylphenol	ND		1	2.0	0.57	ug/L	01/02/2015 1431
3,3'-Dichlorobenzidine	ND		1	5.0	0.81	ug/L	01/02/2015 1431
3-Nitroaniline	ND		1	2.0	0.77	ug/L	01/02/2015 1431
4,6-Dinitro-2-methylphenol	ND		1	5.0	1.5	ug/L	01/02/2015 1431
4-Bromophenyl phenyl ether	ND		1	1.0	0.12	ug/L	01/02/2015 1431
4-Chloro-3-methyl phenol	ND		1	1.0	0.22	ug/L	01/02/2015 1431
4-Chloroaniline	ND		1	1.0	0.13	ug/L	01/02/2015 1431
4-Chlorophenyl phenyl ether	ND		1	1.0	0.11	ug/L	01/02/2015 1431
4-Nitroaniline	ND		1	2.0	0.39	ug/L	01/02/2015 1431
4-Nitrophenol	ND		1	5.0	0.64	ug/L	01/02/2015 1431
Acenaphthene	ND		1	1.0	0.090	ug/L	01/02/2015 1431
Acenaphthylene	ND		1	1.0	0.16	ug/L	01/02/2015 1431
Anthracene	ND		1	1.0	0.13	ug/L	01/02/2015 1431
Benzo(a)anthracene	ND		1	1.0	0.15	ug/L	01/02/2015 1431
Benzo(a)pyrene	ND		1	1.0	0.16	ug/L	01/02/2015 1431
Benzo(b)fluoranthene	ND		1	1.0	0.20	ug/L	01/02/2015 1431
Benzo(g,h,i)perylene	ND		1	1.0	0.23	ug/L	01/02/2015 1431
Benzo(k)fluoranthene	ND		1	1.0	0.12	ug/L	01/02/2015 1431
bis(2-Chloroethoxy)methane	ND		1	1.0	0.13	ug/L	01/02/2015 1431
bis(2-Chloroisopropyl)ether	ND		1	1.0	0.080	ug/L	01/02/2015 1431
bis(2-Ethylhexyl)phthalate	ND		1	5.0	1.7	ug/L	01/02/2015 1431
Butyl benzyl phthalate	ND		1	5.0	1.7	ug/L	01/02/2015 1431
Carbazole	ND		1	1.0	0.25	ug/L	01/02/2015 1431
Chrysene	ND		1	1.0	0.12	ug/L	01/02/2015 1431
Di-n-butyl phthalate	ND		1	5.0	1.7	ug/L	01/02/2015 1431
Di-n-octylphthalate	ND		1	5.0	1.7	ug/L	01/02/2015 1431
Dibenzo(a,h)anthracene	ND		1	1.0	0.13	ug/L	01/02/2015 1431
Dibenzofuran	ND		1	1.0	0.16	ug/L	01/02/2015 1431
Diethylphthalate	ND		1	5.0	1.7	ug/L	01/02/2015 1431
Dimethyl phthalate	ND		1	5.0	1.7	ug/L	01/02/2015 1431
Fluoranthene	ND		1	1.0	0.21	ug/L	01/02/2015 1431

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ64194-001
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Fluorene	ND		1	1.0	0.10	ug/L	01/02/2015 1431
Hexachlorobenzene	ND		1	1.0	0.21	ug/L	01/02/2015 1431
Hexachlorobutadiene	ND		1	1.0	0.090	ug/L	01/02/2015 1431
Hexachlorocyclopentadiene	ND		1	5.0	0.23	ug/L	01/02/2015 1431
Hexachloroethane	ND		1	1.0	0.11	ug/L	01/02/2015 1431
Indeno(1,2,3-c,d)pyrene	ND		1	1.0	0.23	ug/L	01/02/2015 1431
Isophorone	ND		1	1.0	0.080	ug/L	01/02/2015 1431
N-Nitrosodi-n-propylamine	ND		1	1.0	0.080	ug/L	01/02/2015 1431
N-Nitrosodiphenylamine (Diphenylamine)	ND		1	1.0	0.38	ug/L	01/02/2015 1431
Naphthalene	ND		1	1.0	0.070	ug/L	01/02/2015 1431
Nitrobenzene	ND		1	1.0	0.10	ug/L	01/02/2015 1431
Pentachlorophenol	ND		1	5.0	0.54	ug/L	01/02/2015 1431
Phenanthrene	ND		1	1.0	0.18	ug/L	01/02/2015 1431
Phenol	ND		1	1.0	0.11	ug/L	01/02/2015 1431
Pyrene	ND		1	1.0	0.16	ug/L	01/02/2015 1431

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		87	41-144
2-Fluorobiphenyl		104	37-129
2-Fluorophenol		91	24-127
Nitrobenzene-d5		84	38-127
Phenol-d5		91	28-128
Terphenyl-d14		111	10-148

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64194-002
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
2,4,5-Trichlorophenol	20	20		1	101	46-125	01/02/2015 1454
2,4,6-Trichlorophenol	20	21		1	103	36-123	01/02/2015 1454
2,4-Dichlorophenol	20	21		1	103	38-127	01/02/2015 1454
2,4-Dimethylphenol	20	28	N	1	138	36-110	01/02/2015 1454
2,4-Dinitrophenol	100	100		1	101	33-143	01/02/2015 1454
2,4-Dinitrotoluene	40	44		1	111	55-137	01/02/2015 1454
2,6-Dinitrotoluene	40	43		1	107	53-128	01/02/2015 1454
2-Chloronaphthalene	20	17		1	87	42-132	01/02/2015 1454
2-Chlorophenol	20	19		1	97	40-128	01/02/2015 1454
2-Methylnaphthalene	20	20		1	101	40-132	01/02/2015 1454
2-Methylphenol	20	18		1	91	33-122	01/02/2015 1454
2-Nitroaniline	40	38		1	94	48-126	01/02/2015 1454
2-Nitrophenol	40	39		1	98	44-131	01/02/2015 1454
3 & 4-Methylphenol	40	36		1	91	48-112	01/02/2015 1454
3-Nitroaniline	40	4.3	N	1	11	29-109	01/02/2015 1454
4,6-Dinitro-2-methylphenol	100	100		1	102	46-151	01/02/2015 1454
4-Bromophenyl phenyl ether	20	19		1	97	49-123	01/02/2015 1454
4-Chloro-3-methyl phenol	20	20		1	98	48-136	01/02/2015 1454
4-Chloroaniline	20	7.1		1	36	18-73	01/02/2015 1454
4-Chlorophenyl phenyl ether	20	20		1	102	34-124	01/02/2015 1454
4-Nitroaniline	40	19		1	48	42-154	01/02/2015 1454
4-Nitrophenol	100	100		1	100	43-145	01/02/2015 1454
Acenaphthene	20	21		1	103	51-130	01/02/2015 1454
Acenaphthylene	20	21		1	107	46-131	01/02/2015 1454
Anthracene	20	21		1	105	48-122	01/02/2015 1454
Benzo(a)anthracene	20	20		1	101	50-143	01/02/2015 1454
Benzo(a)pyrene	20	110	N	1	533	55-141	01/02/2015 1454
Benzo(b)fluoranthene	20	210	N	1	1040	48-147	01/02/2015 1454
Benzo(g,h,i)perylene	20	110	N	1	542	48-139	01/02/2015 1454
Benzo(k)fluoranthene	20	190	N	1	968	48-148	01/02/2015 1454
bis(2-Chloroethoxy)methane	20	11		1	57	46-130	01/02/2015 1454
bis(2-Chloroisopropyl)ether	20	17		1	87	36-133	01/02/2015 1454
bis(2-Ethylhexyl)phthalate	20	17		1	86	40-141	01/02/2015 1454
Butyl benzyl phthalate	20	20		1	100	52-142	01/02/2015 1454
Carbazole	20	2.3	N	1	11	45-101	01/02/2015 1454
Chrysene	20	22		1	111	51-137	01/02/2015 1454
Di-n-butyl phthalate	20	22		1	112	50-134	01/02/2015 1454
Di-n-octylphthalate	20	160	N	1	786	50-136	01/02/2015 1454
Dibenzo(a,h)anthracene	20	160	N	1	809	48-139	01/02/2015 1454
Dibenzofuran	20	20		1	102	45-142	01/02/2015 1454
Diethylphthalate	20	21		1	106	48-124	01/02/2015 1454
Dimethyl phthalate	20	21		1	106	43-122	01/02/2015 1454
Fluoranthene	20	22		1	109	50-124	01/02/2015 1454
Fluorene	20	21		1	106	39-122	01/02/2015 1454

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ64194-002
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hexachlorobenzene	20	21		1	104	46-125	01/02/2015 1454
Hexachlorobutadiene	20	18		1	90	38-121	01/02/2015 1454
Hexachlorocyclopentadiene	100	58		1	58	24-110	01/02/2015 1454
Hexachloroethane	20	17		1	85	32-109	01/02/2015 1454
Indeno(1,2,3-c,d)pyrene	20	120	N	1	599	49-146	01/02/2015 1454
Isophorone	20	18		1	91	43-118	01/02/2015 1454
N-Nitrosodi-n-propylamine	20	17		1	84	46-135	01/02/2015 1454
N-Nitrosodiphenylamine (Diphenylamine)	4.3	2.0		1	46	44-124	01/02/2015 1454
Naphthalene	20	19		1	95	45-118	01/02/2015 1454
Nitrobenzene	20	18		1	88	46-131	01/02/2015 1454
Pentachlorophenol	100	84		1	84	30-137	01/02/2015 1454
Phenanthrene	20	21		1	105	49-122	01/02/2015 1454
Phenol	20	17		1	87	35-118	01/02/2015 1454
Pyrene	20	19		1	95	50-130	01/02/2015 1454

Surrogate	Q	% Rec	Acceptance Limit
2,4,6-Tribromophenol		112	41-144
2-Fluorobiphenyl		102	37-129
2-Fluorophenol		89	24-127
Nitrobenzene-d5		90	38-127
Phenol-d5		89	28-128
Terphenyl-d14		120	10-148

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MS

Sample ID: PL24008-004MS
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acenaphthene	ND	40	42		1	105	10-133	01/02/2015 1540
Acenaphthylene	ND	40	49		1	124	34-128	01/02/2015 1540
Anthracene	ND	40	39		1	98	48-122	01/02/2015 1540
Benzo(a)anthracene	ND	40	31		1	77	53-98	01/02/2015 1540
Benzo(a)pyrene	ND	40	24		1	61	11-160	01/02/2015 1540
Benzo(b)fluoranthene	ND	40	34		1	84	10-165	01/02/2015 1540
Benzo(g,h,i)perylene	ND	40	23		1	58	42-111	01/02/2015 1540
Benzo(k)fluoranthene	ND	40	32		1	81	13-175	01/02/2015 1540
4-Bromophenyl phenyl ether	ND	40	37		1	93	49-123	01/02/2015 1540
Butyl benzyl phthalate	ND	40	37		1	91	52-142	01/02/2015 1540
Carbazole	ND	40	41	N	1	104	45-101	01/02/2015 1540
4-Chloro-3-methyl phenol	ND	40	40	N	1	99	40-98	01/02/2015 1540
4-Chloroaniline	ND	40	11		1	28	10-98	01/02/2015 1540
bis(2-Chloroethoxy)methane	ND	40	36		1	91	43-93	01/02/2015 1540
bis(2-Chloroisopropyl)ether	ND	40	35		1	88	36-99	01/02/2015 1540
2-Chloronaphthalene	ND	40	35		1	86	40-89	01/02/2015 1540
2-Chlorophenol	ND	40	39	N	1	97	33-92	01/02/2015 1540
4-Chlorophenyl phenyl ether	ND	40	39		1	98	34-124	01/02/2015 1540
Chrysene	ND	40	32		1	80	51-107	01/02/2015 1540
Dibenzo(a,h)anthracene	ND	40	24		1	61	47-116	01/02/2015 1540
Dibenzofuran	ND	40	40	N	1	101	45-94	01/02/2015 1540
2,4-Dichlorophenol	ND	40	42		1	104	34-105	01/02/2015 1540
Diethylphthalate	ND	40	41		1	101	48-124	01/02/2015 1540
Dimethyl phthalate	ND	40	42		1	105	43-122	01/02/2015 1540
2,4-Dimethylphenol	ND	40	55	N	1	138	33-77	01/02/2015 1540
Di-n-butyl phthalate	ND	40	37		1	92	50-134	01/02/2015 1540
4,6-Dinitro-2-methylphenol	ND	200	210		1	103	33-118	01/02/2015 1540
2,4-Dinitrophenol	ND	200	200		1	101	19-119	01/02/2015 1540
2,4-Dinitrotoluene	ND	80	86	N	1	108	50-104	01/02/2015 1540
2,6-Dinitrotoluene	ND	80	86		1	108	53-128	01/02/2015 1540
Di-n-octylphthalate	ND	40	27		1	67	40-112	01/02/2015 1540
bis(2-Ethylhexyl)phthalate	ND	40	24		1	61	10-142	01/02/2015 1540
Fluoranthene	ND	40	39		1	97	50-124	01/02/2015 1540
Fluorene	ND	40	42		1	105	39-122	01/02/2015 1540
Hexachlorobenzene	ND	40	39		1	98	46-125	01/02/2015 1540
Hexachlorobutadiene	ND	40	35		1	87	42-94	01/02/2015 1540
Hexachlorocyclopentadiene	ND	200	100		1	52	14-89	01/02/2015 1540
Hexachloroethane	ND	40	35	N	1	87	39-86	01/02/2015 1540
Indeno(1,2,3-c,d)pyrene	ND	40	24		1	59	43-113	01/02/2015 1540
Isophorone	ND	40	37	N	1	92	42-84	01/02/2015 1540
2-Methylnaphthalene	0.21	40	41		1	101	40-132	01/02/2015 1540
2-Methylphenol	ND	40	38		1	95	33-122	01/02/2015 1540
3 & 4-Methylphenol	ND	80	77		1	96	24-97	01/02/2015 1540
Naphthalene	4.1	40	39		1	86	46-89	01/02/2015 1540

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MS

Sample ID: PL24008-004MS
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
2-Nitroaniline	ND	80	85		1	106	48-126	01/02/2015 1540
3-Nitroaniline	ND	80	32		1	40	10-110	01/02/2015 1540
4-Nitroaniline	ND	80	73		1	91	41-99	01/02/2015 1540
Nitrobenzene	ND	40	35		1	89	44-91	01/02/2015 1540
2-Nitrophenol	ND	80	79		1	99	34-102	01/02/2015 1540
4-Nitrophenol	ND	200	190		1	94	29-122	01/02/2015 1540
N-Nitrosodi-n-propylamine	ND	40	34		1	84	41-96	01/02/2015 1540
N-Nitrosodiphenylamine (Diphenylamine)	ND	83	24		1	29	10-150	01/02/2015 1540
Pentachlorophenol	ND	200	160		1	82	32-110	01/02/2015 1540
Phenanthrene	ND	40	41		1	102	49-122	01/02/2015 1540
Phenol	ND	40	35		1	88	33-92	01/02/2015 1540
Pyrene	ND	40	37		1	91	50-130	01/02/2015 1540
2,4,5-Trichlorophenol	ND	40	41		1	102	46-125	01/02/2015 1540
2,4,6-Trichlorophenol	ND	40	41		1	103	36-123	01/02/2015 1540

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl	N	20	37-129
2-Fluorophenol	N	17	24-127
Nitrobenzene-d5	N	18	38-127
Phenol-d5	N	18	28-128
Terphenyl-d14		16	10-148
2,4,6-Tribromophenol	N	22	41-144

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MSD

Sample ID: PL24008-004MD
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Acenaphthene	ND	40	43		1	108	2.6	10-133	40	01/02/2015 1603
Acenaphthylene	ND	40	51		1	127	2.8	34-128	40	01/02/2015 1603
Anthracene	ND	40	41		1	102	4.7	48-122	40	01/02/2015 1603
Benzo(a)anthracene	ND	40	35		1	87	12	53-98	40	01/02/2015 1603
Benzo(a)pyrene	ND	40	29		1	73	18	11-160	40	01/02/2015 1603
Benzo(b)fluoranthene	ND	40	36		1	90	6.3	10-165	40	01/02/2015 1603
Benzo(g,h,i)perylene	ND	40	25		1	62	7.2	42-111	40	01/02/2015 1603
Benzo(k)fluoranthene	ND	40	36		1	91	12	13-175	40	01/02/2015 1603
4-Bromophenyl phenyl ether	ND	40	38		1	96	3.5	49-123	40	01/02/2015 1603
Butyl benzyl phthalate	ND	40	39		1	98	7.1	52-142	40	01/02/2015 1603
Carbazole	ND	40	44	N	1	111	6.9	45-101	40	01/02/2015 1603
4-Chloro-3-methyl phenol	ND	40	40	N	1	99	0.18	40-98	40	01/02/2015 1603
4-Chloroaniline	ND	40	20	+	1	49	56	10-98	40	01/02/2015 1603
bis(2-Chloroethoxy)methane	ND	40	37		1	92	1.1	43-93	40	01/02/2015 1603
bis(2-Chloroisopropyl)ether	ND	40	34		1	86	2.3	36-99	40	01/02/2015 1603
2-Chloronaphthalene	ND	40	35		1	87	0.47	40-89	40	01/02/2015 1603
2-Chlorophenol	ND	40	38	N	1	95	1.8	33-92	40	01/02/2015 1603
4-Chlorophenyl phenyl ether	ND	40	40		1	101	3.2	34-124	40	01/02/2015 1603
Chrysene	ND	40	36		1	89	12	51-107	40	01/02/2015 1603
Dibenzo(a,h)anthracene	ND	40	27		1	66	9.1	47-116	40	01/02/2015 1603
Dibenzofuran	ND	40	41	N	1	102	0.91	45-94	40	01/02/2015 1603
2,4-Dichlorophenol	ND	40	41		1	101	2.4	34-105	40	01/02/2015 1603
Diethylphthalate	ND	40	41		1	103	1.5	48-124	40	01/02/2015 1603
Dimethyl phthalate	ND	40	42		1	106	0.61	43-122	40	01/02/2015 1603
2,4-Dimethylphenol	ND	40	52	N	1	130	5.5	33-77	40	01/02/2015 1603
Di-n-butyl phthalate	ND	40	37		1	92	0.033	50-134	40	01/02/2015 1603
4,6-Dinitro-2-methylphenol	ND	200	210		1	106	2.6	33-118	40	01/02/2015 1603
2,4-Dinitrophenol	ND	200	210		1	103	1.7	19-119	40	01/02/2015 1603
2,4-Dinitrotoluene	ND	80	88	N	1	110	1.6	50-104	40	01/02/2015 1603
2,6-Dinitrotoluene	ND	80	88		1	109	1.4	53-128	40	01/02/2015 1603
Di-n-octylphthalate	ND	40	30		1	76	13	40-112	40	01/02/2015 1603
bis(2-Ethylhexyl)phthalate	ND	40	30		1	76	21	10-142	40	01/02/2015 1603
Fluoranthene	ND	40	40		1	99	1.9	50-124	40	01/02/2015 1603
Fluorene	ND	40	43		1	106	1.3	39-122	40	01/02/2015 1603
Hexachlorobenzene	ND	40	42		1	104	6.5	46-125	40	01/02/2015 1603
Hexachlorobutadiene	ND	40	35		1	87	0.76	42-94	40	01/02/2015 1603
Hexachlorocyclopentadiene	ND	200	110		1	55	4.1	14-89	40	01/02/2015 1603
Hexachloroethane	ND	40	33		1	83	4.3	39-86	40	01/02/2015 1603
Indeno(1,2,3-c,d)pyrene	ND	40	26		1	64	8.6	43-113	40	01/02/2015 1603
Isophorone	ND	40	37	N	1	92	0.82	42-84	40	01/02/2015 1603
2-Methylnaphthalene	0.21	40	41		1	101	0.21	40-132	40	01/02/2015 1603
2-Methylphenol	ND	40	37		1	94	1.4	33-122	40	01/02/2015 1603
3 & 4-Methylphenol	ND	80	75		1	94	2.0	24-97	40	01/02/2015 1603
Naphthalene	4.1	40	37		1	82	3.9	46-89	40	01/02/2015 1603

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Semivolatile Organic Compounds by GC/MS - MSD

Sample ID: PL24008-004MD
Batch: 64194
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1637

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
2-Nitroaniline	ND	80	87		1	108	2.1	48-126	40	01/02/2015 1603
3-Nitroaniline	ND	80	62	+	1	77	64	10-110	40	01/02/2015 1603
4-Nitroaniline	ND	80	86	N	1	107	16	41-99	40	01/02/2015 1603
Nitrobenzene	ND	40	34		1	86	3.3	44-91	40	01/02/2015 1603
2-Nitrophenol	ND	80	78		1	97	1.7	34-102	40	01/02/2015 1603
4-Nitrophenol	ND	200	190		1	95	1.1	29-122	40	01/02/2015 1603
N-Nitrosodi-n-propylamine	ND	40	33		1	83	2.0	41-96	40	01/02/2015 1603
N-Nitrosodiphenylamine (Diphenylamine)	ND	83	33		1	40	32	10-150	40	01/02/2015 1603
Pentachlorophenol	ND	200	160		1	82	0.93	32-110	40	01/02/2015 1603
Phenanthrene	ND	40	41		1	104	2.1	49-122	40	01/02/2015 1603
Phenol	ND	40	35		1	88	0.65	33-92	40	01/02/2015 1603
Pyrene	ND	40	38		1	95	3.6	50-130	40	01/02/2015 1603
2,4,5-Trichlorophenol	ND	40	41		1	101	0.35	46-125	40	01/02/2015 1603
2,4,6-Trichlorophenol	ND	40	42		1	105	1.8	36-123	40	01/02/2015 1603

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl	N	20	37-129
2-Fluorophenol	N	17	24-127
Nitrobenzene-d5	N	18	38-127
Phenol-d5	N	18	28-128
Terphenyl-d14		19	10-148
2,4,6-Tribromophenol	N	22	41-144

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MB

Sample ID: PQ64188-001
Batch: 64188
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1702

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
4,4'-DDD	ND		1	0.025	0.0010	ug/L	01/06/2015 1134
4,4'-DDE	ND		1	0.025	0.011	ug/L	01/06/2015 1134
4,4'-DDT	ND		1	0.025	0.0020	ug/L	01/06/2015 1134
Aldrin	ND		1	0.025	0.0017	ug/L	01/06/2015 1134
alpha-BHC	ND		1	0.025	0.0010	ug/L	01/06/2015 1134
alpha-Chlordane	ND		1	0.025	0.0013	ug/L	01/06/2015 1134
beta-BHC	ND		1	0.025	0.0039	ug/L	01/06/2015 1134
delta-BHC	ND		1	0.025	0.0011	ug/L	01/06/2015 1134
Dieldrin	ND		1	0.025	0.0010	ug/L	01/06/2015 1134
Endosulfan I	ND		1	0.025	0.0022	ug/L	01/06/2015 1134
Endosulfan II	ND		1	0.025	0.0015	ug/L	01/06/2015 1134
Endosulfan sulfate	ND		1	0.025	0.0011	ug/L	01/06/2015 1134
Endrin	ND		1	0.025	0.0010	ug/L	01/06/2015 1134
Endrin aldehyde	0.0042	J	1	0.025	0.0019	ug/L	01/06/2015 1134
Endrin ketone	ND		1	0.025	0.0012	ug/L	01/06/2015 1134
gamma-BHC (Lindane)	ND		1	0.025	0.0011	ug/L	01/06/2015 1134
gamma-Chlordane	ND		1	0.025	0.0015	ug/L	01/06/2015 1134
Heptachlor	ND		1	0.025	0.013	ug/L	01/06/2015 1134
Heptachlor epoxide	ND		1	0.025	0.0020	ug/L	01/06/2015 1134
Methoxychlor	ND		1	0.10	0.0020	ug/L	01/06/2015 1134
Toxaphene	ND		1	0.25	0.11	ug/L	01/06/2015 1134

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		55	10-122
Tetrachloro-m-xylene		65	46-119

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - LCS

Sample ID: PQ64188-002
Batch: 64188
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1702

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
4,4'-DDD	0.50	0.47		1	94	70-130	01/06/2015 1148
4,4'-DDE	0.50	0.47		1	94	70-130	01/06/2015 1148
4,4'-DDT	0.50	0.50		1	100	70-130	01/06/2015 1148
Aldrin	0.50	0.46		1	92	70-130	01/06/2015 1148
alpha-BHC	0.50	0.44		1	88	70-130	01/06/2015 1148
alpha-Chlordane	0.50	0.48		1	95	70-130	01/06/2015 1148
beta-BHC	0.50	0.42		1	84	70-130	01/06/2015 1148
delta-BHC	0.50	0.47		1	95	70-130	01/06/2015 1148
Dieldrin	0.50	0.49		1	98	70-130	01/06/2015 1148
Endosulfan I	0.50	0.46		1	92	70-130	01/06/2015 1148
Endosulfan II	0.50	0.48		1	96	70-130	01/06/2015 1148
Endosulfan sulfate	0.50	0.49		1	98	70-130	01/06/2015 1148
Endrin	0.50	0.47		1	93	70-130	01/06/2015 1148
Endrin aldehyde	0.50	0.45		1	91	70-130	01/06/2015 1148
Endrin ketone	0.50	0.51		1	102	70-130	01/06/2015 1148
gamma-BHC (Lindane)	0.50	0.45		1	91	70-130	01/06/2015 1148
gamma-Chlordane	0.50	0.45		1	90	70-130	01/06/2015 1148
Heptachlor	0.50	0.42		1	85	70-130	01/06/2015 1148
Heptachlor epoxide	0.50	0.45		1	90	70-130	01/06/2015 1148
Methoxychlor	0.50	0.52		1	104	70-130	01/06/2015 1148

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		70	10-122
Tetrachloro-m-xylene		64	46-119

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MS

Sample ID: PL24008-001MS
Batch: 64188
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1702

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Aldrin	0.0065	1.0	0.80		1	79	70-130	01/06/2015 1217
gamma-BHC (Lindane)	0.0090	1.0	0.92		1	91	70-130	01/06/2015 1217
alpha-BHC	0.0032	1.0	0.94		1	94	70-130	01/06/2015 1217
beta-BHC	0.020	1.0	0.95		1	93	70-130	01/06/2015 1217
delta-BHC	0.013	1.0	1.1		1	110	70-130	01/06/2015 1217
alpha-Chlordane	ND	1.0	0.87		1	87	70-130	01/06/2015 1217
gamma-Chlordane	0.0022	1.0	0.84		1	84	70-130	01/06/2015 1217
4,4'-DDD	ND	1.0	0.92		1	92	70-130	01/06/2015 1217
4,4'-DDE	ND	1.0	0.88		1	88	70-130	01/06/2015 1217
4,4'-DDT	ND	1.0	1.0		1	100	70-130	01/06/2015 1217
Dieldrin	ND	1.0	0.93		1	93	70-130	01/06/2015 1217
Endosulfan I	ND	1.0	0.84		1	84	70-130	01/06/2015 1217
Endosulfan II	ND	1.0	0.92		1	92	70-130	01/06/2015 1217
Endosulfan sulfate	0.010	1.0	1.2		1	118	70-130	01/06/2015 1217
Endrin	0.0035	1.0	0.90		1	89	70-130	01/06/2015 1217
Endrin aldehyde	0.0054	1.0	1.0		1	100	70-130	01/06/2015 1217
Endrin ketone	ND	1.0	1.1		1	110	70-130	01/06/2015 1217
Heptachlor	ND	1.0	0.92		1	92	70-130	01/06/2015 1217
Heptachlor epoxide	ND	1.0	0.88		1	88	70-130	01/06/2015 1217
Methoxychlor	ND	1.0	1.0		1	102	70-130	01/06/2015 1217

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		39	10-122
Tetrachloro-m-xylene		66	46-119

PQL = Practical quantitation limit

ND = Not detected at or above the MDL

P = The RPD between two GC columns exceeds 40%

J = Estimated result < PQL and ≥ MDL

N = Recovery is out of criteria

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Organochlorine Pesticides by GC - MSD

Sample ID: PL24008-001MD
Batch: 64188
Analytical Method: 8081B

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 12/29/2014 1702

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Aldrin	0.0065	1.0	0.83		1	82	4.1	70-130	30	01/06/2015 1231
gamma-BHC (Lindane)	0.0090	1.0	0.92		1	91	0.76	70-130	30	01/06/2015 1231
alpha-BHC	0.0032	1.0	0.92		1	92	2.2	70-130	30	01/06/2015 1231
beta-BHC	0.020	1.0	0.94		1	92	0.51	70-130	30	01/06/2015 1231
delta-BHC	0.013	1.0	1.1		1	111	1.6	70-130	30	01/06/2015 1231
alpha-Chlordane	ND	1.0	0.89		1	89	2.5	70-130	30	01/06/2015 1231
gamma-Chlordane	0.0022	1.0	0.87		1	86	2.8	70-130	30	01/06/2015 1231
4,4'-DDD	ND	1.0	0.97		1	97	5.5	70-130	30	01/06/2015 1231
4,4'-DDE	ND	1.0	0.91		1	91	2.5	70-130	30	01/06/2015 1231
4,4'-DDT	ND	1.0	1.1		1	111	10	70-130	30	01/06/2015 1231
Dieldrin	ND	1.0	0.95		1	95	2.8	70-130	30	01/06/2015 1231
Endosulfan I	ND	1.0	0.90		1	90	7.1	70-130	30	01/06/2015 1231
Endosulfan II	ND	1.0	0.96		1	96	3.9	70-130	30	01/06/2015 1231
Endosulfan sulfate	0.010	1.0	1.2		1	119	0.39	70-130	30	01/06/2015 1231
Endrin	0.0035	1.0	0.93		1	93	3.6	70-130	30	01/06/2015 1231
Endrin aldehyde	0.0054	1.0	1.1		1	105	4.9	70-130	30	01/06/2015 1231
Endrin ketone	ND	1.0	1.2		1	118	6.9	70-130	30	01/06/2015 1231
Heptachlor	ND	1.0	0.96		1	96	3.7	70-130	30	01/06/2015 1231
Heptachlor epoxide	ND	1.0	0.92		1	92	4.2	70-130	30	01/06/2015 1231
Methoxychlor	ND	1.0	1.1		1	113	9.4	70-130	30	01/06/2015 1231

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		53	10-122
Tetrachloro-m-xylene		65	46-119

PQL = Practical quantitation limit

ND = Not detected at or above the MDL

P = The RPD between two GC columns exceeds 40%

J = Estimated result < PQL and ≥ MDL

N = Recovery is out of criteria

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ63991-001
Batch: 63991
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/26/2014 912

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Arsenic	ND		1	0.010	0.0040	mg/L	12/31/2014 2218
Barium	ND		1	0.025	0.0075	mg/L	12/31/2014 2218
Cadmium	ND		1	0.0020	0.00060	mg/L	12/31/2014 2218
Chromium	ND		1	0.0050	0.0021	mg/L	12/31/2014 2218
Lead	ND		1	0.010	0.0019	mg/L	12/31/2014 2218
Selenium	ND		1	0.010	0.0026	mg/L	12/31/2014 2218
Silver	ND		1	0.0050	0.00040	mg/L	12/31/2014 2218

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ63991-002
Batch: 63991
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/26/2014 912

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	0.40	0.42		1	105	80-120	12/31/2014 2223
Barium	2.0	2.2		1	109	80-120	12/31/2014 2223
Cadmium	0.40	0.41		1	101	80-120	12/31/2014 2223
Chromium	2.0	2.1		1	107	80-120	12/31/2014 2223
Lead	0.40	0.43		1	107	80-120	12/31/2014 2223
Selenium	0.40	0.43		1	107	80-120	12/31/2014 2223
Silver	0.40	0.42		1	104	80-120	12/31/2014 2223

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MB

Sample ID: PQ63991-001
Batch: 63991
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/26/2014 912

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Arsenic	ND		1	0.010	0.0040	mg/L	12/31/2014 2218
Dissolved Barium	ND		1	0.025	0.0075	mg/L	12/31/2014 2218
Dissolved Cadmium	ND		1	0.0020	0.00060	mg/L	12/31/2014 2218
Dissolved Chromium	ND		1	0.0050	0.0021	mg/L	12/31/2014 2218
Dissolved Lead	ND		1	0.010	0.0019	mg/L	12/31/2014 2218
Dissolved Selenium	ND		1	0.010	0.0026	mg/L	12/31/2014 2218
Dissolved Silver	ND		1	0.0050	0.00040	mg/L	12/31/2014 2218

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - LCS

Sample ID: PQ63991-002
Batch: 63991
Analytical Method: 6010C

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 12/26/2014 912

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Arsenic	0.40	0.42		1	105	80-120	12/31/2014 2223
Dissolved Barium	2.0	2.2		1	109	80-120	12/31/2014 2223
Dissolved Cadmium	0.40	0.41		1	101	80-120	12/31/2014 2223
Dissolved Chromium	2.0	2.1		1	107	80-120	12/31/2014 2223
Dissolved Lead	0.40	0.43		1	107	80-120	12/31/2014 2223
Dissolved Selenium	0.40	0.43		1	107	80-120	12/31/2014 2223
Dissolved Silver	0.40	0.42		1	104	80-120	12/31/2014 2223

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MB

Sample ID: PQ64240-001
Batch: 64240
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	ND		1	0.00010	0.000015	mg/L	12/30/2014 1247

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - LCS

Sample ID: PQ64240-002
Batch: 64240
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.0020	0.0019		1	96	85-115	12/30/2014 1249

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MS

Sample ID: PL24008-002MS
Batch: 64240
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.000018	0.0020	0.0019		1	95	85-115	12/30/2014 1309

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

RCRA Metals - MSD

Sample ID: PL24008-002MD
Batch: 64240
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Mercury	0.000018	0.0020	0.0019		1	97	1.1	85-115	20	12/30/2014 1311

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - MB

Sample ID: PQ64240-001
Batch: 64240
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Mercury	ND		1	0.00010	0.000015	mg/L	12/30/2014 1247

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved RCRA Metals - LCS

Sample ID: PQ64240-002
Batch: 64240
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 12/30/2014 946

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Mercury	0.0020	0.0019		1	96	85-115	12/30/2014 1249

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

SHEALY ENVIRONMENTAL SERVICES, INC.

106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

Chain of Custody Record

Number 43714

Client: ARCADIS	Report to Contact: Scott Bostian	Telephone No. / E-mail: scott.bostian@arcadis-us.com
Address: 801 Corporate Center Dr. #300	Sampler's Signature: X / Danny Mays	Quote No.
City: Raleigh State: NC Zip Code: 27607	Printed Name: Jared Fine / Danny Mays	Page 1 of 1
Project Name: HAA-01		PL24008
Project No.: 10153801.0001.AE001	P.O. No.	

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	Grab / Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	VOC	SVOC	RCRA 8 Metals	Hex Chrome	QC Pesticides	1,4-Dioxane	Remarks / Cooler I.D.
HA01COEMW02(122314)	12/23/14	0951	G	X			2			3			X				X		
HA01COEMW03(122314)	12/23/14	1051	G	X			2	2		3			X		X	X		X	
HA01HMW14R(122314)	12/23/14	1151	G	X			2			3			X				X		
HA01HMW09(122314)	12/23/14	1036	G	X			2			3			X	X					
HA01MW09(122314)	12/23/14	0922	G	X			2			3			X				X		
HA01HMW08(122314)	12/23/14	1142	G	X						3			X						
HA01COEMW01(122214)	12/22/14	1611	G	X			2			3			X				X		
HA01MW10(122214)	12/22/14	1642	G	X						3			X						
HA01MW11(122214)	12/22/14	1550	G	X						3			X						
TRIP BLANK	12/23/14	—	—	X						2			X						

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☑ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	12/23/14	1400	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	12-24-14	1125	4. Laboratory received by: Kelly M	12-24-14	1125

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes / No Ice Pack
Receipt Temp. 1-6, 1-9 °C 403, 098

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AO-133 Effective Date: 06-01-2014

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com
Level 1 Report v2.1
SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 16

Replaces Date: 07/15/14
Effective Date: 11/07/14

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: KWP / 12-24-14 Lot #: PL24008

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other			
Yes ☑	No ☐		1. Were custody seals present on the cooler?
Yes ☑	No ☐	NA ☐	2. If custody seals were present, were they intact and unbroken?
Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt: 403 / 1.7 / 1.6 °C 098 / 2.0 / 1.9 °C ___ / ___ / ___ °C ___ / ___ / ___ °C Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: #4 IR Gun Correction Factor: -0.1 °C Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.)
Yes ☐	No ☑	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐		5. Were proper custody procedures (relinquished/received) followed?
Yes ☐	No ☑	NA ☐	5a Were samples relinquished by client to commercial courier?
Yes ☑	No ☐		6. Were sample IDs listed on the COC?
Yes ☑	No ☐		7. Were sample IDs listed on all sample containers?
Yes ☑	No ☐		8. Was collection date & time listed on the COC?
Yes ☑	No ☐		9. Was collection date & time listed on all sample containers?
Yes ☑	No ☐		10. Did all container label information (ID, date, time) agree with the COC?
Yes ☑	No ☐		11. Were tests to be performed listed on the COC?
Yes ☑	No ☐		12. Did all samples arrive in the proper containers for each test?
Yes ☐	No ☐		13. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐		14. Was adequate sample volume available?
Yes ☐	No ☑		15. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑		16. Were any samples containers missing?
Yes ☐	No ☑		17. Were there any excess samples not listed on COC?
Yes ☐	No ☑	NA ☐	18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	20. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	22. Were collection temperatures documented on the COC for NC samples?
Yes ☐	No ☐	NA ☑	23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
Yes ☐	No ☑		24. Was the quote number used taken from the container label?
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)			
Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) using SR #_____.			
Sample(s)_____ were received with bubbles >6 mm in diameter.			
Sample(s)_____ were received with TRC >0.2 mg/L (If #21 is No)			
SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____ Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR#_____			
Sample labels applied by: KWP Verified by: _____ Date: 12-24-14			

Comments: Cr 64 received out of hold

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

Analytical data were evaluated in accordance with applicable USEPA SW-846 method requirements, "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999), "USEPA Contract Laboratory Program National Functional Guidelines for Inrganic Data Review" (July 2002), analytical method control criteria, the analytical laboratory Quality Assurance Control Limits, the Fort Stewart Military Reservation and Hunter Army Airfield Quality Assurance Project Plan (ARCADIS-2008), and professional judgment.

The data review summarized in this report includes a review of all sample collection documentation and the electronic data validation of the analytical data housed in the project database. Sample collection documentation included sample collection logs and chains of custody. The electronic data validation was performed utilizing the EQuIS Data Qualification Module (DQM). DQM checks for the following parameters:

- Holding times and preservation;
- Blank contamination;
    1. Method blanks,
    2. Trip blanks,
    3. Equipment blanks;
- Matrix spike and Duplicate sample recovery;
- Matrix Spike and Matrix Spike Duplicate relative percent differences;
- Laboratory Control Sample and Duplicate recovery;
- Laboratory Control Sample and Duplicate relative percent differences;
- Surrogate recovery (organic analyses only); and
- Field duplicate relative percent difference.

Manual review was performed for the following items:

- Sample dilutions and reporting limits;
- Case Narratives; and
- Laboratory Duplicates

Data was generated by Shealy Environmental Services, Inc. – West Columbia, South Carolina. Data qualifiers were applied electronically to the database with any additional qualifiers added manually. A summary of the data as amended by data qualifiers is included with the original hard copy reports.

The attached table summarizes the data that were qualified due to QC deficiencies. The table indicates compounds/analytes qualified based on electronic and manual validation. Refer to the associated method section of the validation checklist for a detailed explanation of qualification. All other data in these SDGs are considered usable as reported.

ARCADIS

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

The following list of data qualifiers and definitions were applied in accordance with qualification criteria defined in the greater than guidance documents:

UB Compound/analyte detected in blank or associated blank, qualified as a non-detect at listed value.

J The analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected greater than the reporting limit; however, the reported quantitation limit is approximate and may, or may not represent the actual limit of quantitation necessary to accurately and precisely measure analyte in the sample.

R The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria; and the presence or absence of the analyte cannot be verified.

U Not detected at the quantitative reporting limit

DQM RUN BY:	Rachelle Borne	01/28/15
REVIEW PERFORMED BY:	Rachelle Borne	01/28/15
SIGNATURE:	Rachelle Borne	01/30/15

ARCADIS

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

The following samples were included in this SDG:

SDG	Sample ID	Sample Date	Parent Sample
PL18008	HA01HMW02(121614)	12/16/2014	
PL18008	HA01HMW04(121614)	12/16/2014	
PL18008	HA01HMW06(121714)	12/16/2014	
PL18008	HA01HMW10(121714)	12/17/2014	
PL18008	HA01HMW11(121614)	12/16/2014	
PL18008	HA01HMW13(121614)	12/16/2014	
PL18008	HA01HMW23(121714)	12/17/2014	
PL18008	HA01HMW24(121714)	12/17/2014	
PL18008	HA01MW14(121614)	12/16/2014	
PL18008	HA01MW15(121714)	12/17/2014	
PL18008	HA01MW17(121614)	12/16/2014	
PL18008	HA01SD01(121714)	12/17/2014	
PL18008	HA01SD02(121714)	12/17/2014	
PL18008	HA01SD03(121714)	12/17/2014	
PL18008	HA01SW02(121714)	12/17/2014	
PL18008	HA01SW03(121714)	12/17/2014	
PL18008	TRIP BLANK_20141216	12/16/2014	
PL18008	D1(121614)	12/16/2014	HA01HMW13(121614)
PL18008	D2(121614)	12/16/2014	HA01MW14(121614)
PL18008	D2(121714)	12/17/2014	HA01SD01(121714)
PL18008	HA01SW01(121714)	12/17/2014	
PL18008	D1(121714)	12/17/2014	HA01SW01(121714)
PL18008	HA01MW14D(121714)	12/17/2014	
PL19009	HAO1SD04(121814)	12/18/2014	
PL19009	HAO1SD05(121814)	12/18/2014	
PL19009	HAO1SD06(121814)	12/18/2014	
PL19009	HAO1SW04(121814)	12/18/2014	
PL19009	HAO1SW05(121814)	12/18/2014	
PL19009	HAO1SW06(121814)	12/18/2014	
PL19009	TRIP BLANK_20141218	12/18/2014	
PL20001	HA01COEMW04(121914)	12/19/2014	
PL20001	HA01COEMW05(121914)	12/19/2014	
PL20001	HA01COEMW06(121914)	12/19/2014	
PL20001	HA01COEMW07(121914)	12/19/2014	
PL20001	HA01COEMW08(121914)	12/19/2014	
PL20001	HA01HMW21(121914)	12/19/2014	
PL20001	HA01MW12(121914)	12/19/2014	
PL20001	HA01MW13(121914)	12/19/2014	
PL20001	TRIP BLANK_20141219	12/19/2014	
PL20001	HA01MW12D(121914)	12/19/2014	
PL24008	HA01COEMW01(122214)	12/22/2014	
PL24008	HA01COEMW02(122314)	12/23/2014	

ARCADIS

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

SDG	Sample ID	Sample Date	Parent Sample
PL24008	HA01COEMW03(122314)	12/23/2014	
PL24008	HA01HMW08(122314)	12/23/2014	
PL24008	HA01HMW09(122314)	12/23/2014	
PL24008	HA01HMW14R(122314)	12/23/2014	
PL24008	HA01MW09(122314)	12/23/2014	
PL24008	HA01MW10(122214)	12/22/2014	
PL24008	HA01MW11(122214)	12/22/2014	
PL24008	TRIP BLANK_20141223	12/23/2014	

ARCADIS

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

ANALYTICAL DATA PACKAGE DOCUMENTATION

GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Methods of analysis		X		X	
4. Reporting limits of analysis		X		X	
5. Master tracking list		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preparation/extraction date		X		X	
9. Sample analysis date		X		X	
10. Copy of chain-of-custody form signed by lab sample custodian		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Laboratory Signature		X		X	
13. South Carolina Certification Number		X		X	

QA - quality assurance

The analytical report was complete with the following exceptions or notations.

Note: The laboratory reported values between the quantitative reporting limit and the method detection limit as estimated concentrations. The "J" qualifier was retained in this validation. Non-detect values are reported at the quantitative reporting limit.

ARCADIS

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

VOLATILE ORGANIC COMPOUNDS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		DQM	DQM	
B. Equipment blanks	NA		NA	
C. Trip blanks		DQM		DQM
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS) A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
6. Matrix spike (MS)				
A. MS %R	DQM		DQM	
B. MS duplicate (MSD) %R	DQM		DQM	
C. MS/MSD precision (RPD)	DQM		DQM	
7. Field/Lab Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference
DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8260B.

3A. SDG (PL18008) 2-Hexanone was detected in the method blanks for batches 63558 and 63634. The associated field samples were non-detect for these compounds; therefore, qualification of the data was not warranted.

SDG (PL19009) 2-Hexanone was detected in the method blanks for batches 63946 and 63634. The associated field samples were non-detect for these compounds; therefore, qualification of the data was not warranted.

3C. SDG (PL18008) Carbon disulfide was detected in the trip blank. The associated field samples were qualified as non-detect for this compound if the sample concentrations were less than five times the blank value.

SDG (PL19009) Carbon disulfide and toluene were detected in the trip blank. The associated field samples were non-detect for these compounds; therefore, qualification of the data was not warranted.

SDG (PL20001) Carbon disulfide was detected in the trip blank. The associated field samples were non-detect for this compound; therefore, qualification of the data was not warranted.

6. SDG (PL18008) Samples HA01HMW06(121714) and HA01MW15(121714) were used as the MS/MSDs. The recoveries and RPDs were acceptable.

SDG (PL2001) Sample HA01COEMW08(121914) was used as the MS/MSD. The recoveries and RPDs were acceptable.

SDG (PL24008) Sample HA01COEMW03(122314) was used as the MS/MSD. The recoveries and RPDs were acceptable.

7. SDG (PL18008) Sample D1(121614) was collected as a field duplicate of HA01HMW13(121614). The RPDs were acceptable at less than 40%.

SDG (PL18008) Sample D2(121614) was collected as a field duplicate of HA01HMW14(121614). The RPDs were acceptable at non-detect.

SDG (PL18008) Sample D1(121714) was collected as a field duplicate of HA01SW01(121714). The RPDs were acceptable at less than 40%.

SDG (PL18008) Sample D2(121714) was collected as a field duplicate of HA01SD01(121714). The RPDs were acceptable at less than 70%.

SEMIVOLATILE ORGANIC COMPOUNDS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	NA		NA	
4. Surrogate spike recoveries		DQM	DQM	
5. Laboratory control sample (LCS) A. LCS %R		DQM	DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
6. Matrix spike (MS)				
A. MS %R		DQM		DQM
B. MS duplicate (MSD) %R		DQM		DQM
C. MS/MSD precision (RPD)		DQM		DQM
7. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference
DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8270D.

4. SDG (PL19009) Two surrogate recoveries were above the control limit in sample HAO1SW05(121814). All SVOC results for this sample were non-detect; therefore, qualification of the data was not warranted.

5A. SDGs (PL18008 and PL19009) The recoveries of 2,4-dimethylphenol and 4-chloroaniline were above the control limit in the LCS for batch 63919. The associated field samples were non-detect for these compounds; therefore, qualification of the data was not warranted.

SDG (PL24008) Several recoveries above the control limit in the LCS. The associated field sample was non-detect for these compounds; therefore, qualification of the data was not warranted. The recoveries of 3-nitroaniline and carbazole were below the control limit in the LCS. The associated field sample was qualified as estimated for these compounds.

6. SDG (PL18008) Sample HA01HMW06(121714) was used as the MS/MSD. The recoveries of carbazole, 3-nitroaniline, 4-nitroaniline and Diphenylamine were less than 10% in the MS and/or the MSD. The parent sample was qualified as rejected for these compounds. Several recoveries and RPDs were outside the control limits. The parent sample was qualified as estimated for these compounds when applicable. See the attached qualification summary for details of the qualifications.

SDG (PL18008) Sample HA01SW03(121714) was used as the MS/MSD. The recoveries of 2,4-dimethylphenol, isophorone and nitrobenzene were above the control limit in the MS and/or the MSD. The parent sample was non-detect for these compounds; therefore, qualification of the data was not warranted.

SDG (PL18008) Sample HA01SD02(121714) was used as the MS/MSD. The recovery of hexachlorocyclopentadiene was below the control limit in the MS. The RPD for this compound was above the control limit. The parent sample was qualified as estimated for hexachlorocyclopentadiene**.**

SDG (PL24008) Sample HA01MW09(122314) was used as the MS/MSD. Several recoveries were above the control limit in the MS and/or the MSD. The parent sample was non-detect for those compounds; therefore, qualification of the data was not warranted. The RPDs for p-chloroaniline and 3-nitroaniline were above the control limit. The parent sample was qualified as estimated for these compounds.

7. SDG (PL18008) Sample D1(121614) was collected as a field duplicate of HA01HMW13(121614). The RPDs were acceptable at less than 40%.

SDG (PL18008) Sample D1(121714) was collected as a field duplicate of HA01SW01(121714). The RPDs were acceptable at non-detect.

SDG (PL18008) Sample D2(121714) was collected as a field duplicate of HA01SD01(121714). The RPDs for anthracene and bis(2-ethylhexyl)phthalate were above the 70% control limit. The parent and the duplicate were qualified as estimated for these compounds.

ARCADIS

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

PESTICIDES

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		DQM		DQM
B. Equipment blanks	NA		NA	
4. Laboratory control sample (LCS) A. LCS %R		DQM		DQM
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
5. Matrix spike (MS)				
A. MS %R	DQM		DQM	
B. MS duplicate (MSD) %R	DQM		DQM	
C. MS/MSD precision (RPD)	DQM		DQM	
6. Surrogate Recoveries	DQM		DQM	
7. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference
DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8081

Note: The "P qualifier was used by the laboratory to indicate that the %D between the 2 columns was greater than 40%. The "P" will be changed to a "J" in this validation to indicate that the result is considered an estimated value.

3A. SDG (PL18008) Endrin, alpha-BHC, delat-BHC and gamma-BHC were detected in the method blank. The associated field samples were qualified as non-detect for these compounds if the sample concentrations were less than five times the blank values.

SDG (PL24008) Endrin aldehyde was detected in the method blank. The associated field samples were qualified as non-detect for this compound if the sample concentrations were less than five times the blank value.

4. SDG (PL19009) The recovery of endrin was below the control limit in the LCS for batch 63984. The associated field samples were qualified as estimated for this compound. The recovery of endrin ketone was above the control limit in the LCS. The associated field samples were non-detect for this compound; therefore, qualification of the data was not warranted.

5. SDG (PL18008) Sample D1(121714) was used as the MS/MSD. The recoveries and RPDs were acceptable.

SDG (PL19009) Sample HAO1SW06(121814) was used as the MS/MSD. The recoveries and RPDs were acceptable.

7. SDG (PL18008) Sample D2(121614) was collected as a field duplicate of HA01HMW14(121614). The RPDs were acceptable at less than 40%.

   SDG (PL18008) Sample D1(121714) was collected as a field duplicate of HA01SW01(121714). The RPDs were acceptable at less than 40%.

   SDG (PL18008) Sample D2(121714) was collected as a field duplicate of HA01SD01(121714). The RPDs were acceptable at less than 70%.

HUNTER STEWART
ELECTRONIC VALIDATION REVIEW REPORT
SDG: PL18008, PL19009, PL20001 and PL24008
HAA-01

METALS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		DQM	DQM	
B. Equipment blanks	NA		NA	
4. Laboratory control sample (LCS) A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
5. Matrix spike (MS)				
A. MS %R	DQM		DQM	
B. MS duplicate (MSD) %R	DQM		DQM	
C. MS/MSD precision (RPD)	DQM		DQM	
6. Field Duplicate precision (RPD)		DQM		DQM

M – Manual Review %R - percent recovery RPD - relative percent difference
DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 6010/7471/7470.

3A. SDG (PL18008 and PL19009) Barium was detected in the method blank for batch 64841. The associated field samples were greater than ten times the blank value for this metal; therefore, qualification of the data was not warranted. Mercury was detected in the method blank for batch 64167. The associated field samples were non-detect for mercury; therefore, qualification of the data was not warranted.

SDG (PL19009) Cadmium and lead were detected in the method blank for batch 63996. The associated field samples were greater than ten times the blank values for these metals; therefore, qualification of the data was not warranted.

5. SDG (PL18008) Samples HA01MW15(121714) and HA01SD02(121714) were used as the MS/MSDs. The recoveries and RPDs were acceptable.

SDG (PL20001) Sample HA01COEMW08(121914) was used as the MS/MSD for mercury. The recoveries and RPD were acceptable.

SDG (PL24008) Sample HA01COEMW03(122314) was used as the MS/MSD for mercury. The recoveries and RPD were acceptable.

6. SDG (PL18008) Sample D2(121614) was collected as a field duplicate of HA01HMW14(121614). The RPD for chromium was above the 40% control limit. The parent and the duplicate were qualified as estimated for chromium.

SDG (PL18008) Sample D1(121714) was collected as a field duplicate of HA01SW01(121714). The RPD for barium was above the 40% control limit. The parent and the duplicate were qualified as estimated for barium.

SDG (PL18008) Sample D2(121714) was collected as a field duplicate of HA01SD01(121714). The RPDs were acceptable at less than 70%.

GENERAL CHEMISTRY

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation		DQM		DQM
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	NA		NA	
4. Laboratory control sample (LCS) A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
5. Matrix spike (MS)				
A. MS %R		DQM		DQM
B. MS duplicate (MSD) %R		DQM		DQM
C. MS/MSD precision (RPD)	DQM		DQM	
6. Field Duplicate precision (RPD)	NA		NA	

M – Manual Review %R - percent recovery RPD - relative percent difference
DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Methods 7196A

1. SDG (PL19009) Samples HAO1SW06(121814), HAO1SW05(121814) and HAO1SW04(121814) were analyzed for hexavalent chromium a few hours beyond the recommended 24 hour holding time. These samples were qualified as estimated for hexavalent chromium.

   SDG (PL20001) Samples HA01COEMW08(121914) and HA01MW13(121914) were analyzed for hexavalent chromium a few hours beyond the recommended 24 hour holding time. These samples were qualified as estimated for hexavalent chromium.

   SDG (PL24008) Samples HA01COEMW03(122314) was analyzed for hexavalent chromium a few hours beyond the recommended 24 hour holding time. This sample was qualified as estimated for total and dissolved hexavalent chromium.

5. SDG (PL18008) Sample HA01MW15(121714) was used as the MS/MSD. The recoveries of dissolved hexavalent chromium were below the control limit in the MS and the MSD. The parent sample was qualified as estimated for this compound.

   SDG (PL18008) Sample HA01SW01(121714) was used as the MS/MSD. The recoveries and RPD were acceptable.

   SDG (PL19009) Sample HAO1SD06(121814) was used as the MS/MSD. The recoveries and RPDs were acceptable.

   SDG (PL19009) Sample HAO1SD06(121814) was used as the MS/MSD. The recovery of hexavalent chromium was 0% in the MS and the MSD. The parent sample was qualified as rejected for hexavalent chromium.

SDG (PL19009) Sample HAO1SD05(121814) was used as the MS. The recovery of hexavalent chromium was below the control limit in the MS. The parent sample was qualified as estimated for hexavalent chromium.

SDG (PL19009) Sample HAO1SD04(121814) was used as the MS. The recovery of hexavalent chromium was above the control limit in the MS. The parent sample was non-detect for hexavalent chromium; therefore, qualification of the data was not warranted.

SDG (PL20001) Samples HA01COEMW04(121914) and HA01HMW21(121914) were used as the MS/MSDs. The recovery of hexavalent chromium was 0% in the MS and the MSD. The parent samples were qualified as rejected for hexavalent chromium.

SDG (PL24008) Sample HAO1COEMW03(122314) was used as the MS/MSD. The recovery of hexavalent chromium was 0% in the MS and the MSD. The parent sample was qualified as rejected for hexavalent chromium.

6. SDG (PL18008) Sample D2(121614) was collected as a field duplicate of HA01HMW14(121614). The RPDs were acceptable at non-detect.

SDG (PL18008) Sample D1(121714) was collected as a field duplicate of HA01SW01(121714). The RPD was acceptable at non-detect.

SDG (PL18008) Sample D2(121714) was collected as a field duplicate of HA01SD01(121714). The RPD was acceptable at less than 70%.

HA-01-2

Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	Dilution
PL18008	D1(121714)	SW6010	Barium	0.029	mg/l	J	FD RPD	1
PL18008	D1(121714)	SW8081B	alpha BHC	0.002	ug/l	UB	Blank Contamination	1
PL18008	D1(121714)	SW8081B	delta BHC	0.002	ug/l	UB	Blank Contamination	1
PL18008	D1(121714)	SW8081B	gamma BHC (Lindane)	0.002	ug/l	UB	Blank Contamination	1
PL18008	D1(121714)	SW8081B	Endrin	0.001	ug/l	UB	Blank Contamination	1
PL18008	D1(121714)	SW8081B	Endrin Aldehyde	0.002	ug/l	J	%D between columns	1
PL18008	D1(121714)	SW8260	Carbon disulfide	0.55	ug/l	UB	Blank Contamination	1
PL18008	D2(121614)	SW6010	Chromium	0.25	mg/l	J	FD RPD	1
PL18008	D2(121614)	SW8081B	alpha-Chlordane	0.002	ug/l	J	%D between columns	1
PL18008	D2(121614)	SW8081B	gamma BHC (Lindane)	0.008	ug/l	UB	Blank Contamination	1
PL18008	D2(121614)	SW8081B	alpha BHC	0.001	ug/l	UB	Blank Contamination	1
PL18008	D2(121614)	SW8081B	delta BHC	0.003	ug/l	UB	Blank Contamination	1
PL18008	D2(121614)	SW8081B	gamma-Chlordane	0.003	ug/l	J	%D between columns	1
PL18008	D2(121614)	SW8081B	p,p-DDT	0.007	ug/l	J	%D between columns	1
PL18008	D2(121614)	SW8081B	Endosulfan II	0.005	ug/l	J	%D between columns	1
PL18008	D2(121614)	SW8081B	Endosulfan I	0.002	ug/l	J	%D between columns	1
PL18008	D2(121614)	SW8260	Carbon disulfide	0.36	ug/l	UB	Blank Contamination	1
PL18008	D2(121714)	SW8081B	Endrin Aldehyde	2.4	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	Endosulfan Sulfate	5.3	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	Endosulfan II	0.76	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	p,p-DDT	4.1	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	Endrin ketone	4.5	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	Dieldrin	0.78	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	Endrin	2	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	p,p-DDD	2.7	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8081B	1,1,1-Trichloro-2,2-bis (p-methoxphenyl)-ethane	17	ug/kg	J	%D between columns	10
PL18008	D2(121714)	SW8270	bis(2-Ethylhexyl)phthalate	1100	ug/kg	J	FD RPD	2
PL18008	D2(121714)	SW8270	Anthracene	260	ug/kg	J	FD RPD	2
PL18008	HA01HMW02(121614)	SW8260	Carbon disulfide	0.18	ug/l	UB	Blank Contamination	1
PL18008	HA01HMW06(121714)	SW8260	Carbon disulfide	0.33	ug/l	UB	Blank Contamination	1
PL18008	HA01HMW06(121714)	SW8270	Di-n-octyl phthalate	<5.0	ug/l	UJ	MSD Recovery and MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	2-Nitroaniline	<2.0	ug/l	UJ	MS Recovery and MS/MSD RPD	1

HA-01-2

Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	Dilution
PL18008	HA01HMW06(121714)	SW8270	Carbazole	<1.0	ug/l	R	MS Recovery <10%	1
PL18008	HA01HMW06(121714)	SW8270	Benzo(a)anthracene	<1.0	ug/l	UJ	MS Recovery and MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	Benzo(a)pyrene	<1.0	ug/l	UJ	MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	1,2-Benz-phenanthracene	<1.0	ug/l	UJ	MS/MSD Recovery	1
PL18008	HA01HMW06(121714)	SW8270	Benzo(k)fluoranthene	<1.0	ug/l	UJ	MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	Benzo(b)fluoranthene	<1.0	ug/l	UJ	MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	3-Nitroaniline	<1.0	ug/l	R	MS/MSD Recovery <10%	1
PL18008	HA01HMW06(121714)	SW8270	Benzo(g,h,i)perylene	<1.0	ug/l	UJ	MS Recovery and MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	N-Nitrosodiphenylamine	<1.0	ug/l	R	MS Recovery <10% and MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	bis(2-Chloroethoxy)methane	<1.0	ug/l	UJ	MS Recovery and MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	p-Nitroaniline	<1.0	ug/l	R	MS/MSD Recovery <10%	1
PL18008	HA01HMW06(121714)	SW8270	Indeno(1,2,3-cd)pyrene	<1.0	ug/l	UJ	MS/MSD Recovery and MS/MSD RPD	1
PL18008	HA01HMW06(121714)	SW8270	Dibenzo(a,h)anthracene	<1.0	ug/l	UJ	MS/MSD Recovery and MS/MSD RPD	1
PL18008	HA01HMW10(121714)	SW8260	Carbon disulfide	0.33	ug/l	UB	Blank Contamination	1
PL18008	HA01HMW11(121614)	SW8260	Carbon disulfide	0.57	ug/l	UB	Blank Contamination	1
PL18008	HA01HMW23(121714)	SW8260	Carbon disulfide	0.32	ug/l	UB	Blank Contamination	1
PL18008	HA01HMW24(121714)	SW8260	Carbon disulfide	0.32	ug/l	UB	Blank Contamination	1
PL18008	HA01MW14(121614)	SW6010	Chromium	0.01	mg/l	J	FD RPD	1
PL18008	HA01MW14(121614)	SW8081B	gamma BHC (Lindane)	0.006	ug/l	UB	Blank Contamination	1
PL18008	HA01MW14D(121714)	SW8260	Carbon disulfide	0.35	ug/l	UB	Blank Contamination	1
PL18008	HA01SD01(121714)	SW8081B	Endrin Aldehyde	2	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	p,p-DDD	1	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	1,1,1-Trichloro-2,2-bis (p-methoxphenyl)-ethane	13	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	Endrin	1.8	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	delta BHC	0.62	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	Endrin ketone	4.7	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	p,p-DDT	2.7	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	Endosulfan Sulfate	3.9	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8081B	gamma BHC (Lindane)	2.4	ug/kg	J	%D between columns	10
PL18008	HA01SD01(121714)	SW8270	bis(2-Ethylhexyl)phthalate	150	ug/kg	J	FD RPD	2
PL18008	HA01SD01(121714)	SW8270	Anthracene	88	ug/kg	J	FD RPD	2
PL18008	HA01SD02(121714)	SW8270	Hexachlorocyclopentadiene	<210.0	ug/kg	UJ	MS Recovery and MS/MSD RPD	1

HA-01-2

Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	Dilution
PL18008	HA01SD03(121714)	SW8081B	Endrin ketone	0.56	ug/kg	J	%D between columns	10
PL18008	HA01SW01(121714)	SW6020	Barium	29	ug/l	J	FD RPD	1
PL18008	HA01SW01(121714)	SW8081B	1,1,1-Trichloro-2,2-bis (p-methoxphenyl)-ethane	0.002	ug/l	J	%D between columns	1
PL18008	HA01SW01(121714)	SW8260	Carbon disulfide	0.64	ug/l	UB	Blank Contamination	1
PL18008	HA01SW02(121714)	SW8081B	gamma BHC (Lindane)	0.002	ug/l	UB	Blank Contamination	1
PL18008	HA01SW02(121714)	SW8260	Carbon disulfide	0.35	ug/l	UB	Blank Contamination	1
PL18008	HA01SW03(121714)	SW8081B	gamma BHC (Lindane)	0.001	ug/l	UB	Blank Contamination	1
PL18008	HA01SW03(121714)	SW8260	Carbon disulfide	0.32	ug/l	UB	Blank Contamination	1
PL19009	HAO1SD04(121814)	SW8081B	alpha-Chlordane	1.3	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Endosulfan Sulfate	29	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Endrin Aldehyde	21	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	p,p-DDD	11	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	1,1,1-Trichloro-2,2-bis (p-methoxphenyl)-ethane	80	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Endrin	14	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Dieldrin	4.1	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	gamma-Chlordane	1.4	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	p,p-DDT	12	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Endosulfan II	2.8	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Aldrin	1.5	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Endosulfan I	1.6	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD04(121814)	SW8081B	Endrin ketone	45	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW7196A	Chromium(VI)	<1.5	mg/kg	UJ	MS Recovery	1
PL19009	HAO1SD05(121814)	SW8081B	Endrin	5.9	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW8081B	Endrin Aldehyde	17	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW8081B	p,p-DDD	38	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW8081B	1,1,1-Trichloro-2,2-bis (p-methoxphenyl)-ethane	110	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW8081B	p,p-DDT	13	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW8081B	Endosulfan Sulfate	5.2	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW8081B	Endosulfan II	3.9	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD05(121814)	SW8081B	gamma-Chlordane	3.6	ug/kg	J	%D Between Columns	20

HA-01-2

Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	Dilution
PL19009	HAO1SD06(121814)	SW7196A	Chromium(VI)	<1.9	mg/kg	R	MS/MSD Recovery	1
PL19009	HAO1SD06(121814)	SW8081B	Endrin Aldehyde	6	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD06(121814)	SW8081B	delta BHC	2.4	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD06(121814)	SW8081B	p,p-DDT	6.2	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD06(121814)	SW8081B	Endrin ketone	15	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD06(121814)	SW8081B	Endrin	6.8	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD06(121814)	SW8081B	1,1,1-Trichloro-2,2-bis (p-methoxphenyl)-ethane	11	ug/kg	J	%D Between Columns	20
PL19009	HAO1SD06(121814)	SW8081B	p,p-DDD	3.6	ug/kg	J	%D Between Columns	20
PL19009	HAO1SW04(121814)	SW7196A	Chromium(VI)	<0.02	mg/l	UJ	Holding Time	1
PL19009	HAO1SW04(121814)	SW8081B	Endrin	<0.025	ug/l	UJ	LCS Recovery	1
PL19009	HAO1SW05(121814)	SW7196A	Chromium(VI)	<0.02	mg/l	UJ	Holding Time	1
PL19009	HAO1SW05(121814)	SW8081B	Endrin	<0.25	ug/l	UJ	LCS Recovery	10
PL19009	HAO1SW06(121814)	SW7196A	Chromium(VI)	<0.02	mg/l	UJ	Holding Time	1
PL19009	HAO1SW06(121814)	SW8081B	Endrin	<0.25	ug/l	UJ	LCS Recovery	10
PL20001	HA01COEMW04(121914)	SW7196A	Chromium(VI)	<0.02	mg/l	R	MS/MSD Recovery 0%	1
PL20001	HA01COEMW08(121914)	SW7196A	Chromium(VI)	<0.02	mg/l	UJ	Holding Time	1
PL20001	HA01COEMW08(121914)	SW7196A	Chromium(VI)	<0.02	mg/l	UJ	Holding Time	1
PL20001	HA01HMW21(121914)	SW7196A	Chromium(VI)	<0.02	mg/l	R	MS/MSD Recovery 0%	1
PL20001	HA01MW13(121914)	SW7196A	Chromium(VI)	<0.02	mg/l	UJ	Holding Time	1
PL24008	HA01COEMW01(122214)	SW8081B	gamma-Chlordane	0.003	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW01(122214)	SW8081B	gamma BHC (Lindane)	0.004	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW01(122214)	SW8081B	delta BHC	0.013	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW01(122214)	SW8081B	Endrin Aldehyde	0.006	ug/l	UB	Blank Contamination	1
PL24008	HA01COEMW01(122214)	SW8081B	Heptachlor Epoxide	0.004	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW01(122214)	SW8081B	alpha BHC	0.003	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW01(122214)	SW8081B	beta BHC	0.018	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW02(122314)	SW8081B	beta BHC	0.02	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW02(122314)	SW8081B	Aldrin	0.007	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW02(122314)	SW8081B	alpha BHC	0.003	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW02(122314)	SW8081B	gamma-Chlordane	0.002	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW02(122314)	SW8081B	delta BHC	0.013	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW02(122314)	SW8081B	Endrin Aldehyde	0.005	ug/l	UB	Blank Contamination	1

HA-01-2

Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	Dilution
PL24008	HA01COEMW02(122314)	SW8081B	Endosulfan Sulfate	0.01	ug/l	J	%D Between 2 columns	1
PL24008	HA01COEMW03(122314)	SW7196A	Chromium(VI)	<0.02	mg/l	R	MS/MSD Recovery	1
PL24008	HA01COEMW03(122314)	SW7196A	Chromium(VI)	<0.02	mg/l	R	MS/MSD Recovery	1
PL24008	HA01HMW09(122314)	SW8270	Carbazole	<1.0	ug/l	UJ	LCS Recovery	1
PL24008	HA01HMW09(122314)	SW8270	p-Chloroaniline	<1.0	ug/l	UJ	MS/MSD RPD	1
PL24008	HA01HMW09(122314)	SW8270	3-Nitroaniline	<2.0	ug/l	UJ	LCS Recovery and MS/MSD RPD	1
PL24008	HA01HMW14R(122314)	SW8081B	beta BHC	0.006	ug/l	J	%D Between 2 columns	1
PL24008	HA01HMW14R(122314)	SW8081B	Heptachlor Epoxide	0.002	ug/l	J	%D Between 2 columns	1
PL24008	HA01HMW14R(122314)	SW8081B	Aldrin	0.002	ug/l	J	%D Between 2 columns	1
PL24008	HA01HMW14R(122314)	SW8081B	delta BHC	0.01	ug/l	J	%D Between 2 columns	1
PL24008	HA01HMW14R(122314)	SW8081B	gamma-Chlordane	0.002	ug/l	J	%D Between 2 columns	1
PL24008	HA01HMW14R(122314)	SW8081B	Endrin Aldehyde	0.008	ug/l	UB	Blank Contamination	1
PL24008	HA01HMW14R(122314)	SW8081B	Endosulfan Sulfate	0.002	ug/l	J	%D Between 2 columns	1
PL24008	HA01MW09(122314)	SW8081B	p,p-DDD	0.006	ug/l	J	%D Between 2 columns	1
PL24008	HA01MW09(122314)	SW8081B	Endosulfan Sulfate	0.007	ug/l	J	%D Between 2 columns	1
PL24008	HA01MW09(122314)	SW8081B	alpha BHC	0.021	ug/l	J	%D Between 2 columns	1
PL24008	HA01MW09(122314)	SW8081B	delta BHC	0.006	ug/l	J	%D Between 2 columns	1
PL24008	HA01MW09(122314)	SW8081B	Endrin Aldehyde	0.011	ug/l	UB	Blank Contamination	1
PL24008	HA01MW09(122314)	SW8081B	gamma-Chlordane	0.003	ug/l	J	%D Between 2 columns	1
PL24008	HA01MW09(122314)	SW8081B	Dieldrin	0.003	ug/l	J	%D Between 2 columns	1
PL24008	HA01MW09(122314)	SW8081B	Endrin	0.017	ug/l	J	%D Between 2 columns	1

APPENDIX H

Arcadis Field Investigation Procedures

ARCADIS
Infrastructure, environment, facilities

Imagine the result

Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP)

Fort Stewart Military Reservation and Hunter Army Airfield, Georgia

February 2009

ARCADIS

Jane Kennedy
Project Chemist

Shelley D. Gibbons
Associate Project Manager

Charles A. Bertz, PE
Senior Project Manager

Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP)

Fort Stewart Military Reservation and Hunter Army Airfield, Georgia

Prepared for:
US Army Environmental Command

Prepared by:
ARCADIS
801 Corporate Center Drive
Suite 300
Raleigh
North Carolina 27607
Tel 919.854.1282
Fax 919.854.5448

Our Ref.:
GP08HAFS.SW00

Date:
February 5, 2009

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

Table of Contents

1. Introduction **1-1**

2. Site Preparation and Mobilization Procedures **2-1**

2.1 Initial Coordination 2-1

2.2 Mobilization and Subcontractor Coordination 2-1

2.3 Utility Clearance 2-1

2.4 Site Reconnaissance 2-2

2.5 Field Operations Contingency Plans 2-2

2.6 On-Site ARCADIS Representative 2-3

2.7 Contractor Compliance and Permitting 2-3

2.8 Adherence to Technical Specifications 2-4

3. Field Investigation Procedures **3-1**

3.1 Lithologic Logging 3-1

3.2 Direct Push Borings and Sample Collection 3-2

3.2.1 Soil Sample Collection 3-2

3.2.2 Groundwater Sample Collection 3-3

3.2.3 Membrane Interface Probe Borings 3-4

3.2.4 Temporary Piezometer Installation 3-4

3.2.5 Temporary Piezometer Fluid Gauging 3-5

3.2.6 Direct Push Boring Abandonment 3-6

3.2.7 Temporary Piezometer Abandonment 3-6

3.3 Drilling Techniques 3-6

3.3.1 Hollow-Stem Auger Techniques in Soil 3-6

3.3.2 Mud Rotary Drilling 3-7

3.3.3 Rotasonic Drilling Methodology 3-8

3.4 Collection of Samples for Geotechnical and Chemical Analyses 3-9

3.4.1 Geotechnical Samples in Soil and Unconsolidated Deposits 3-9

3.4.2 Geotechnical Samples in Sediment 3-10

3.4.3 Samples for Chemical Analyses 3-11

3.5 Monitoring Well Construction 3-12

3.5.1 Shallow and Intermediate Well Construction 3-12

3.5.2 Pre-pack Screen Monitoring Well Construction 3-14

3.5.3 Monitoring Well Construction Beneath a Confining or Semi-Confining Layer 3-14

3.5.4 Borehole and Well Abandonment 3-16

3.5.5 Temporary Well Abandonment 3-16

3.5.6 Soil Boring Abandonment 3-16

3.6 Groundwater Level Measurements and Sampling 3-17

3.6.1 Groundwater Level Measurements 3-17

3.6.2 Low-Flow Groundwater Purging and Sample Collection 3-18

3.6.3 Slug Test 3-21

3.6.4 Constant Rate Pump Test 3-22

3.6.5 LNAPL Bail Down Test 3-23

3.7 Test Pit Excavations 3-24

3.8 Sediment Sampling 3-24

3.8.1 Shallow Ditch Sediment Sampling 3-24

3.8.2 Deep Ditch Sediment Sampling 3-25

3.8.3 Shallow Stream Sediment Sampling 3-27

3.9 Surface Water Sampling 3-28

3.10 Field Analytical Measurements 3-30

3.11 Quality Control Samples 3-30

3.12 Field Equipment Decontamination 3-32

3.12.1 Cleaning Materials 3-32

3.12.2 Marking and Segregation of Used Field Equipment 3-33

3.12.3 Safety Procedures to be Utilized During Cleaning Operations 3-33

3.12.4 Storage of Field Equipment and Sample Containers 3-33

3.12.5 Cleaning Procedures 3-34

3.12.5.1 Drilling and Direct Push Equipment 3-34

3.12.5.2 Teflon™, Stainless Steel, or Glass Field Sampling Equipment 3-34

3.12.5.3 Other Sampling Equipment 3-35

3.12.5.4 Trace Organic Sampling Equipment 3-35

3.12.5.5 Field Analytical Equipment and Other Field Instruments 3-36

3.12.5.6 Ice Chests and Shipping Containers 3-36

3.12.6 Disposable Materials 3-36

3.13 Characterization and Disposal of Investigative Derived Wastes 3-37

3.13.1 Soils/Sediment/Waste 3-37

3.13.2 Water 3-37

3.14 Site Survey 3-37

4. Field Documentation Procedures 4-1

4.1 Sample Designation 4-1

4.2 Field Activity Documentation 4-3

4.2.1 Utilities and Structures Checklist 4-4

4.2.2 Location Sketch 4-4

4.2.3 Boring/ Well Construction Logs 4-4

4.2.4 Water Level Measurement Form 4-4

4.2.5 Sample Key 4-4

4.2.6 Sampling Location Survey Summary 4-5

4.2.7 Water Sample Log 4-5

4.2.8 Groundwater Sampling Form 4-5

4.2.9 Well Sampling Summary 4-5

4.2.10 Water Level/Pumping Test Record 4-5

4.2.11 Soil/Sediment Sample Log 4-5

4.2.12 Soil Sampling Summary 4-6

4.2.13 Surface Water Sample Log 4-6

4.2.14 Field Instrument Calibration Form 4-6

4.2.15 Daily Log 4-6

4.2.16 Sample Label 4-7

4.2.17 Chain-of-Custody Form 4-7

4.2.18 Chain-of-Custody Seal 4-8

4.2.19 Bill of Lading 4-8

4.3 Chain-of-Custody Procedures 4-8

4.3.1 Transfer of Custody 4-9

4.3.2 Sample Preparation and Shipment 4-9

4.3.3 Laboratory Sample Receiving 4-9

5. References 5-1

Figure

3-1 Well Schematic for Prepacked Screens

Appendices

A Site-Wide QAPP

B Field Forms

- Utilities and Structures Checklist
- Location Sketch
- Boring/Well Construction Log
- Well Construction Log (Unconsolidated)
- Well Construction Log - Telescoping
- Well Development Form
- Geoprobe® Groundwater Sample Form
- Well Sampling Summary
- Water Level Measurement Form
- Water Level/Pumping Test Record
- Sample Key

- Sampling Location Survey Summary
- Soil/Sediment Sample Log
- Soil Sampling Summary
- Groundwater Sample Form
- Surface Water Sample Log
- PID Calibration Form
- Field Instrument Calibration Log
- Daily Log
- Chain-of-Custody Record

Acronyms and Abbreviations

amsl	above mean sea level
ARCADIS	ARCADIS U.S., Inc.
ASTM	American Society for Testing and Materials
bgs	below ground surface
COC	chain of custody
DPW	Department of Public Works
FID	flame ionization detector
ft	feet
GAEPD	Georgia Environmental Protection Division
gpm	gallons per minute
GPS	global positioning system
HASP	Health and Safety Plan
HSRA	Hazardous Site Response Act
IDW	investigative derived waste
MIP	membrane interface probe
mL/min	milliliters per minute
MS/MSDs	matrix spike/matrix spike duplicates
NAPL	non-aqueous phase liquid
NTUs	nephelometric turbidity units
O.D.	outside diameter
ORP	oxidation reduction potential
OCGA	Official Code of Georgia Annotated
PBC	Performance Based Contract

PCB	polychlorinated biphenyl
PID	photoionization detector
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
TCLP	Toxicity Characteristic Leaching Procedure
UPC	Utility Protection Center
USEPA	United States Environmental Protection Agency
USCS	Unified Soil Classification System
VOC	volatile organic compound

1. Introduction

This Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) was prepared by ARCADIS U.S., Inc. (ARCADIS) to provide field personnel with detailed instructions and procedures regarding field activities to be performed in support of Resource Conservation and Recovery Act (RCRA) and Hazardous Site Response Act (HSRA) remedial activities and to document the performance of all environmental field activities at the Fort Stewart Military Reservation and Hunter Army Airfield in Georgia.

This site-wide SAP provides a detailed description of the field investigation methodologies that will be used to complete the RCRA and HSRA remedial process at the Sites included in ARCADIS' Performance Based Contract (PBC) contract. The QAPP, included as Appendix A, presents the policies, organization, objectives, functional activities, and specific quality assurance/ quality control (QA/QC) procedures. The QA/QC procedures will be employed by ARCADIS to ensure that all technical data generated are accurate and representative, and the data will be of known and usable quality for the intended purpose. Site-specific work plans that further define the scope of activities to be performed at each individual Site will reference this plan for the general procedures to be used in completing the prescribed field activities.

ARCADIS field personnel will use the procedures described in this SAP to produce accurate, comparable, and reproducible data for reduction and evaluation. This SAP is divided into four sections. A brief description of each section is provided below:

- **Section 1, Introduction** – Summarizes the purpose and organization of the plan.

- **Section 2, Site Preparation and Mobilization Procedures** – Describes the tasks to be performed prior to mobilization to the field, including notification and coordination requirements.

- **Section 3, Field Investigation Procedures** – Presents a detailed discussion of the procedures to be used in completing the field tasks, including information on drilling, well construction, sampling, decontamination, investigation derived waste, and the site survey.

- **Section 4, Field Documentation Procedures** – Outlines the methods to be used for sample designation, chain-of-custody (COC) procedures, and field documentation.

Throughout this SAP, reference is made to standard forms and logs used by ARCADIS field personnel to record field observations and measurements. Examples of each of these forms are provided in Appendix B of this SAP.

2. Site Preparation and Mobilization Procedures

Initial project coordination, subcontractor coordination, and utility clearance activities will be conducted prior to initiating the field sampling activities. These pre-mobilization activities are discussed in the following subsections.

2.1 Initial Coordination

The Fort Stewart and Hunter Army Airfield environmental staff will be notified at least 2 weeks before the start of any field work.

2.2 Mobilization and Subcontractor Coordination

The subcontractors, including drillers, laboratories, and surveyors, will be selected and contracts will be executed in advance of beginning the field activities.

2.3 Utility Clearance

Prior to mobilization, all underground utility lines, and other underground structures will be clearly marked. ARCADIS personnel will be responsible for making certain the underground utilities and structures are located and marked. ARCADIS is responsible for submitting a utility locate request through the Georgia Utility Protection Center (UPC). UPC will accept these locate request either by phone or internet. The phone number is (800) 282-7411. The UPC web address is www.gaupc.com and click on IRTH login to make the request. In order to submit a request using the website, pre-registration will be required. The contractor must mark the boundaries of the proposed work site using either white paint, flags or stakes. Department of Public Works (DPW) will accept responsibility for accuracy of the locates pertaining to gas and fuel lines, water lines, electrical lines to include secondary electricity, airfield lighting, low voltage, fire systems, sewer lines, roof drain lines, storm drain lines, industrial waste lines, chilled water lines, high temperature water lines, irrigation systems, and DPW non-fiber computer lines. These requests will be forwarded to all utility companies with services present within the proposed work site.

Permits will be issued within 48 hours of the next business day following the receipt of the request by UPC. The permits will only be valid for 21 days and renewal requests should be submitted a minimum of 3 days prior to expiration. Requesting contractors are responsible for maintaining marks during the 21-day period. If, after acquiring a

permit, a utility is damaged during field activities, the appropriate utility company must be notified. DPW's utilities are listed above and the points of contact are:

Fort Stewart	Carletha Joyce	(912) 767-6669
HAAF	Tony West	(912) 315-5523

The contractor should be prepared to submit proof of a valid permit at that time.

ARCADIS personnel will be responsible for notifying the Fort Stewart and Hunter Army Airfield environmental office of planned intrusive activities at least 2 weeks prior to the initiation of field activities. Upon arrival at the installation, the field operations leader will check the proposed drilling, sampling, and trenching locations for marked underground utilities, other underground structures, and above-ground pipe racks or power lines. A Utilities and Structures Checklist (Appendix B) will be completed by the Field Operations Leader for each area to be sampled prior to commencement of field activities. A copy of the completed checklist will be retained in the ARCADIS project file.

2.4 Site Reconnaissance

Prior to startup of drilling or sampling activities in a particular area, field personnel will conduct a brief site reconnaissance to determine if any problems with the drilling or sampling locations will be encountered. The sampling locations will be sketched on the Location Sketch Form (Appendix B). In addition, at the start of field activities at each Site, the field personnel will notify the Fort Stewart and Hunter Army Airfield environmental staff of the work schedule, and sampling and drilling locations.

2.5 Field Operations Contingency Plans

If during the field program, any unforeseen problems or conditions are encountered that require re-evaluation or corrective action, such as, but not limited to, extreme precipitation events, site emergencies that require evacuation of field personnel, changes in site conditions, security problems, loss of power or communications, or community relations problems, the following contingencies will be put into place:

- For any problem or condition encountered by the field team, the team personnel will immediately notify the Fort Stewart and Hunter Army Airfield environmental staff and/or the ARCADIS Project Manager for direction or approval of corrective action.

- If the problem or condition requires downtime at the site and re-evaluation of any site conditions, assumptions made about the site conditions, or plans prepared for the site, the field team will contact the ARCADIS Project Manager and the Fort Stewart and Hunter Army Airfield environmental staff for consultation.

- If after consultation, the problem or condition continues, the field program will remain on hold until direction is received from the Fort Stewart and Hunter Army Airfield representative and/or ARCADIS Project Manager. The field program will not continue until the problem is resolved.

- Any time these contingency procedures are implemented, the following will be documented in the daily log of activities:

    - Problem or condition encountered;
    - Personnel involved;
    - Management personnel contacted;
    - Corrective actions taken, if any; and
    - Dates and times involved.

2.6 On-Site ARCADIS Representative

A qualified ARCADIS representative will be on-site during all probing, drilling and sample collection activities. The ARCADIS representative will have in their possession a copy of the Site-Specific Work Plan and the associated Site-Wide Work Plans, including the SAP, QAPP, and Health and Safety Plan (HASP). The Site-Wide Work Plans encompass work at all Fort Stewart and Hunter Army Airfield PBC sites. The ARCADIS representative will also have on-site any equipment, tools, references, and documentation necessary to collect, describe, and document the information generated from the field activities.

2.7 Contractor Compliance and Permitting

The contractors selected for this project shall comply with any and all installation, local, state, and federal health and safety regulations and requirements. The contractors are responsible, per ARCADIS' contractual agreements, for securing and/or complying with permits required by state or local authorities. The selected contractors will have the necessary license(s) or certifications required to perform such work in Georgia.

2.8 Adherence to Technical Specifications

All work performed by ARCADIS or a contractor, whether it be drilling, sampling, equipment decontamination or other related activities will be in accordance with the procedures described in this SAP, and properly and completely documented by the on-site ARCADIS representative on forms provided herein (Appendix B).

3. Field Investigation Procedures

A detailed discussion of the field procedures that will be employed to complete the field tasks is provided in the following sections. All field procedures are in accordance with the United States Environmental Protection Agency (USEPA) Field Branches Quality System Technical Procedures (USEPA, 2008).

All soil, groundwater, and surface water samples collected will be analyzed by a certified Georgia Laboratory as listed in the Site-Wide QAPP (Appendix A). Samples will be preserved according to the selected analytical method. Specific method preservation requirements, size and type of sample containers to be used, and holding times for each parameter are listed in the Site-Wide QAPP (Appendix A).

3.1 Lithologic Logging

The lithology of the soil and bedrock samples collected will be described through visual observations of the soil/bedrock cores using the Unified Soil Classification System (USCS) and/or the American Society for Testing and Materials (ASTM) International Standard D 2488 for Description and Identification of Soils. The Boring/Well Construction Log (Appendix B) will be used to record lithologic logging observations. The following logging sequence will be used for the description of unconsolidated materials:

- Describe major soil type and percentage;
- Describe composition of the soil;
- Describe the moisture, texture, and color of the soil;
- Document other geologic observations such as bedding characteristics, structure and orientation, and primary and secondary permeability/porosity (if possible); and
- Document observations on drilling progress including sample interval loss and recovery.

3.2 Direct Push Borings and Sample Collection

Direct-push soil sampling consists of hydraulically pushing or driving a small diameter, hollow steel rod to a target depth and collecting a soil or groundwater sample. The equipment necessary for the collection of samples using the direct push technique is mounted on a regular van or truck for ease of mobility. The steel probe rods, 3 feet (ft) to 4 ft in length, are threaded for easy connection and have tight seals to provide a continuous length of rod. The rods are hydraulically driven or hammered to target depths. The steel rods can be driven to depths of up 150 ft through unconsolidated sediments.

3.2.1 Soil Sample Collection

The following procedures will be used during the collection of soil samples from direct push borings:

1. Record borehole location and intended sample depth intervals on the Boring/Well Construction Log (Appendix B).
2. Line the 3-ft or 4-ft steel soil sampler core barrel with an acetate, polyethylene or Teflon liner and attach sampler to end of steel rods.
3. Hydraulically push or drive the 3-ft or 4-ft soil sampler and rods to intended depth. Soil samples will be collected from intervals specified in the Site-Specific Work Plan.
4. Open the core barrel and disassemble revealing the soil core sample within the liner. Label the depths on each end of liner and mark the top and bottom to maintain proper core orientation
5. Remove a portion of the liner over the entire length of the core using an appropriate cutting tool.
6. Screen soils immediately in the field using a photoionization detector (PID) or flame ionization detector (FID) to document the levels of organic vapors present. To collect volatile organic headspace readings, place the soil sample in a sealed plastic bag approximately two-thirds full allowing for approximately 30 percent headspace. Place the bag in a dry area, which is as close to room temperature (70º F) as practical. After 10 minutes, use a PID or FID to measure the vapors that accumulate in the bag due to off-gassing from the sample. Base PID/FID usage on the target analytes. If a PID is used, select

the appropriate lamp based on the target analyte. Record the measurement on the Sample/Core Log.

7. Collect soil sample(s) for laboratory analysis. Don a clean pair of disposable gloves immediately prior to sample collection. VOC samples will be collected directly from the target depth interval of the soil core to minimize disturbance using an EnCore™ sampler or equivalent (Terra Core). Transfer the remaining soil from the target depth interval to a stainless steel bowl. Mix the soil using a stainless steel spoon until the sample is visually uniform. Remove any debris or larger rocks observed during mixing using the spoon. Collect non-VOC analysis samples from the bowl and place in appropriate sample container, label the container, and place on ice. Note on the field sample log the depth interval from which the sample aliquot was collected. The container and preservative requirements for soil samples are outlined in the Site-Wide QAPP (Appendix A). Double-bag the ice used for sample shipment in self-sealing bags prior to placement in the cooler.
8. Extract from the liners the portion of the soil core not submitted to the laboratory for analysis and use for logging purposes.
9. Describe the soil samples in the field. The lithology of the soil will be described by a qualified and experienced ARCADIS representative through visual observations of the soil core using the USCS or ASTM designation.
10. Place all soil cuttings in drums or roll-off box.
11. Properly decontaminate all down-hole sampling equipment prior to subsequent use in consecutive sample collection. Decontamination procedures are described in Section 3.12.

3.2.2 Groundwater Sample Collection

The following procedures will be used during the collection of shallow groundwater samples from direct push borings. When sampling for metals from direct push borings, both total and dissolved metals will be analyzed to assess the effect of turbidity on the sample results. Polychlorinated biphenyl (PCB) samples will not be collected from direct push borings.

1. Record sampling location and intended sample depth intervals on the Geoprobe® Groundwater Sampling Form (Appendix B).

2. Drive a stainless steel retractable screen attached to the bottom of the hollow steel rods to the target depth beneath the groundwater table. Target depths will be specified in the Site-Specific Work Plan for each Site.
3. Raise rods to approximately 2 to 4 ft to allow the screen to be exposed at the target depth, thus allowing collection of groundwater samples at the target depth.
4. Insert polyethylene or Tygon tubing (1/4-inch diameter) into the hollow rods to allow for collection of grab groundwater samples with a peristaltic pump or dedicated tubing with a check valve assemblage. The tubing with check valve method will be used as the sole means of collecting samples for volatiles organic analysis.
5. Don a clean pair of disposable gloves immediately prior to sample collection. Collect groundwater samples directly into laboratory-prepared, preserved sample bottles and place directly on ice. Fill the sample bottles in the following order: volatile organic compounds (VOCs) first, then remaining analytes.
6. Prepare sample containers according to the container and preservative requirements outlined in the QAPP (Appendix A). Include on the sample label the following: sample identifier, laboratory methodology requested, the sample matrix, date, time, project name, and name of sampler.

3.2.3 Membrane Interface Probe Borings

The Membrane Interface Probe (MIP) is a type of direct push tool, advanced by a standard direct push rig that logs both total VOC concentrations and soil conductivity with depth. The following procedures will be used during the completion of direct push borings using the MIP.

1. Record borehole location on the Boring/Well Construction Log (Appendix B).
2. Hydraulically push the MIP and rods to intended target depth, typically not greater than 60 ft below ground surface (bgs). Because the MIP probe cannot be hydraulically hammered, the MIP probe cannot be driven as deep as conventional Geoprobe® borings.

3.2.4 Temporary Piezometer Installation

Temporary piezometers may be installed in selected Geoprobe® groundwater boring locations in accordance with the Official Code of Georgia Annotated (OCGA) Well

Standards 12-5-134 (State of Georgia, 2008). The temporary piezometer installation procedures are discussed below.

1. After the collection of groundwater samples from the selected Geoprobe® groundwater borings, a temporary piezometer will be installed in the borehole and will be constructed with 10 ft sections of 1-inch to 1¼-inch diameter polyvinyl chloride (PVC) screen and riser.
2. The natural formation will be allowed to collapse around the piezometers.
3. The annular space around the upper 10 ft of the piezometer will be filled with granular bentonite and then hydrated to prevent possible interference from surface water leakage.
4. Because the piezometer is considered temporary, a concrete surface pad will not be installed. Unless otherwise approved by the Georgia Environmental Protection Division (GAEPD), temporary piezometers will be converted to permanent monitoring points or abandoned within 5 days.
5. Each piezometer will be closed with a PVC cap.

3.2.5 Temporary Piezometer Fluid Gauging

Static fluid levels in each temporary piezometer will be gauged using an electronic water-level indicator. Fluid-level measurements will be documented on the Water Level Measurement Form (Appendix B) and will later be converted to mean sea level for reporting purposes.

The following procedures will be implemented when collecting fluid-level measurements:

1. Remove the piezometer cap and document the general condition of the piezometer. In areas where non-aqueous phase liquids (NAPLs) are known to exist or have been present in the past, a PID or FID will be used to check the well for build-up of potentially hazardous gases.
2. Measure static fluid-level elevation using an electronic water-level indicator from fixed reference point (generally the north side of the top of the PVC casing).
3. Repeat the measurements every 5 minutes until two consecutive measurements are obtained that are within 0.01 ft.

Fluid-level measurements will be referenced to a surveyed elevation point located on the top of the piezometer casing. All fluid-level measurements will be taken at least two times to check the reproducibility of the measurement data. If it is found that the measurement cannot be reproduced, a second set of data will be collected. Fluid levels will be collected until the data can be reproduced. This measurement validation process ensures the accuracy of the fluid-level data.

Equipment used to measure the fluid level will be properly decontaminated before first use and between use at each well using the procedures described in Section 3.12.

3.2.6 Direct Push Boring Abandonment

Direct push soil borings installed at the site will be abandoned by allowing the saturated portion of the formation (i.e., unconsolidated sands and gravel) to collapse back into the 2-inch diameter borehole as the Geoprobe® rods are retracted. The upper 10 ft of the borehole will be plugged with granular bentonite and hydrated with potable water to make an impermeable seal.

3.2.7 Temporary Piezometer Abandonment

After the well casing and screen materials from the temporary piezometers have been pulled out of the ground, the borehole will either be filled with granular bentonite or a high solids bentonite-cement slurry mix to within at least three feet of ground surface. If bentonite is used, it will be hydrated with potable water, and the remainder of the borehole will be filled with native soil or clay.

3.3 Drilling Techniques

All soil borings and monitoring wells will be drilled and installed by a Georgia licensed water well driller.

3.3.1 Hollow-Stem Auger Techniques in Soil

Dependent on subsurface soil conditions at the Sites, shallow soil borings may be drilled using hollow-stem auger techniques (ASTM 1452). Soil samples can be collected continuously (if so scoped in a site-specific work plan) using a continuous sampler, or split-spoon sampler (ASTM 1586 and 1587) depending upon percent recovery realized using the continuous core sampler. The following steps outline the

procedures that will be used to drill a shallow borehole for geotechnical or analytical purposes and for the installation of a monitoring well.

1. Record borehole location on the Location Sketch form and intended sample depth intervals on a Boring/Well Construction Log (Appendix B).

2. Clean and assemble the continuous sampler. The continuous core sampler (5 ft in length by 6 inches outside diameter (O.D.) is advanced in the borehole ahead of the augers (8-inch O.D.) and retrieved through the hollow-stem portion of the augers after each 5 ft drilled.

3. Disassemble the core barrel, revealing the soil core sample. Screen the soil samples with a PID/FID and describe in the field using the logging method described in Section 3.1.

4. Collect discrete samples from the core sample based on field screening data (prior to logging) and place in laboratory-prepared glass jars for analytical purposes. The preservation and handling of the samples is discussed in Section 3.4.3.

5. If continuous core sampling is not possible due to the character of the subsurface material encountered, collect samples every 5 ft using a standard split-spoon sampler (2 ft by 2 inch O.D.). Attach the split spoon to the drill rods, insert within the hollow-stem auger, and drive into the unconsolidated deposits using a standard 140-pound drop hammer and rig-driven cathead. Record blow counts for each 6-inch penetration of the split spoon. Drive each split spoon a total of 24 inches.

6. Collect all soil cuttings generated during the drilling of the boreholes and store temporarily on plastic or in a drum or roll-off box while awaiting characterization.

3.3.2 Mud Rotary Drilling

The mud-rotary system consists of a drilling fluid mixture of potable water and bentonite that is pumped down the inside of the drill pipe, and then returned to the surface through the annulus between the drill pipe and the borehole wall. This fluid cools the drill bit, carries the cuttings to the surface, prevents excessive fluid loss into the formation, and

prevents the formation from collapsing. The drilling fluid flows into a mud pit where the cuttings settle out and then is pumped back down the drill rods.

The following steps outline the procedures that will be used for mud rotary drilling.

1. Record borehole location and intended sample depth intervals (if appropriate) on the Boring/Well Construction Log (Appendix B).

2. Drill the deep boreholes from the surface to 1 to 2 ft into the bedrock using a mud rotary drilling rig equipped with a six-inch bit and stabilizer. No formation sampling will be conducted in the deep boreholes.

3. Record any significant or sudden fluid loss or production and soil cutting observations from drilling mud on the Boring/Well Construction Log (Appendix B).

4. Terminate the borehole within the upper 1 to 2 ft of the bedrock surface, which will be determined by the detection of the bedrock fragments in the return mud.

5. Collect all drill cuttings generated during the deep borehole drilling and temporarily stage in either 55-gallon steel drums or a roll-off box while awaiting chemical characterization as discussed in Section 3.13.

3.3.3 Rotasonic Drilling Methodology

Monitoring wells and the soil borings (other than those drilled using direct push methods) will have the option to also be drilled using rotasonic drilling methods. The rotasonic drilling method uses a combination of rotary power, hydraulic pull down pressure, and mechanically generated oscillations to advance a dual line of drill pipe. The top mounted hydraulically powered drill head transmits the rotary power, hydraulic down pressure, and vibratory power directly to the dual line of pipe. The inner drill pipe, measuring from 3-inch to 9-inch I.D., contains a core bit and represents the core barrel sampler. The outer pipe, measuring 4 inches to 12 inches, is used to prevent the collapse of the borehole and is therefore used in the construction of monitoring wells from 1 inch to 8 inches in diameter. This combination of forces advances the inner core barrel sampler through typically difficult unconsolidated deposits and some consolidated formations without the use of mud or air.

Water is not necessary during drilling but may be used in small quantities to help lubricate the drill pipe as it is advanced. Drilling rates are equal to or greater than other conventional rotary methods when they include some method of continuous sampling. The inner drill pipe is always advanced in front of the outer drill pipe. Continuous core samples of 1 foot to 20 ft can be completed depending on job specifications and site conditions.

During typical borehole advancement, the first step is to advance the inner drill pipe and core bit about 6 ft or 10 ft into the ground. Once the inner drill pipe is set, the outer drill pipe is advanced down over the inner drill pipe to hold the boring open. The inner drill pipe is mechanically lifted by the drill head to the surface for core sample recovery. The core sample is vibrated out of the inner drill pipe into a plastic sheath or a stainless steel sample tray. The core sample also can be collected in a split stainless steel or a lexan core barrel liner. The inner drill pipe is then advanced to the top of the next sample interval. These steps are repeated until the desired total depth is reached. Installation of a well would be performed inside the outer drill pipe, which would be removed as the well materials are installed. This will keep the borehole walls from collapsing and ensure that a good sand pack is installed. Monitoring well construction details are discussed in Section 3.5.

All drilling and sampling equipment will be decontaminated according to the procedures outlined in Section 3.12 of this report between each borehole location.

3.4 Collection of Samples for Geotechnical and Chemical Analyses

The procedures for the collection of soil samples during hollow stem auger drilling for geotechnical and chemical analyses are described below.

3.4.1 Geotechnical Samples in Soil and Unconsolidated Deposits

1. Record the soil sample location, depth, date and time of collection, sample identification, name of sampling personnel, and type of drilling and sampling equipment on the Boring/Well Construction Log (Appendix B).

2. Clean and assemble the continuous or split-spoon sampler. The sampler will be fitted with 6-inch long California (brass) rings or equivalent sampler liners, so that soil samples can be retrieved with minimum disturbance for geotechnical analyses.

3. Lower the sampler through the drill stem to the desired sampling depth. If using a split-spoon sampler, drive the sampler with a standard 140-pound hammer free-falling 30 inches in accordance with ASTM Method D1586. Record the number of blows per foot required to drive the split spoon.

4. After the continuous core barrel or split-spoon sampler is retrieved and opened, mark with indelible ink the depths of the sample at the top and bottom of each brass ring. Don a clean pair of disposable gloves immediately prior to sample collection. Using a stainless steel spatula or knife, cut the soil sample between the brass rings. Using plastic caps, cap each end of each ring. Label each ring with the appropriate sample designation.

5. The geotechnical samples do not have to be placed on ice or chilled.

6. Submit to geotechnical laboratory using COC procedures (Section 4.3).

7. From the remaining soil core, conduct field screening and describe soil sample lithology using procedures outlined in Section 3.1.

8. Alternate methodologies that may be used to obtain geotechnical samples, such as the use of a Shelby tube, will be described in the Site-Specific Work Plan for each Site.

3.4.2 Geotechnical Samples in Sediment

The procedures for the collection of geotechnical samples from shallow and deep sediments are outlined below.

1. If standing water is located over the sampling location and a deep sediment sample is to be collected, then the upper sediment and surface water should be removed prior to sample collection. Drive a minimum 4-inch O.D. schedule 40 PVC blank casing into sediment sampling location. Place a wooden board on top of PVC casing while driving casing into sediment to prevent breaking the casing. Use peristaltic pump to remove surface water from casing.

2. If collecting the geotechnical sample at 1.5 to 2.0 ft bgs, remove overburden with a decontaminated stainless steel bucket auger to a depth just above top of sampling depth (i.e., 1.5 ft bgs).

3. Drive a decontaminated 1 to 2-inch diameter stainless steel soil sampler lined with a plastic or acetate liner to depth required. A disposable acetate or thin walled stainless steel soil probe may also be used.

4. If a gravelly substrate is encountered, a decontaminated bucket auger may be used to collect the sample from 1.5 to 2.0 ft bgs.

5. Cap the liner and retract the sampler. The sample core may not remain in the sampler or tube if the top is not capped.

6. Cap the bottom of the sample. If a liner is used, remove the liner from the sampler, then cap the bottom of the sample.

7. If freestanding water was also captured in the sampling tube or liner, remove the top cap and gently pour off the water without disturbing the sediment sample.

8. Don a clean pair of disposable gloves immediately prior to sample collection. If using a bucket auger to collect the geotechnical sample, remove sample from bucket and pack into laboratory container.

9. Document the sample on a Soil/Sediment Sample Log (Appendix B).

10. The geotechnical samples do not have to be placed on ice or chilled.

11. Submit to geotechnical laboratory using COC procedures (Section 4.3).

3.4.3 Samples for Chemical Analyses

The procedures for collection of samples for chemical analyses are outlined below.

1. Record the soil sample location, depth, date and time of collection, sample identification, name of sampling personnel, and type of drilling and sampling equipment on the Boring/Well Construction Log (Appendix B).

2. Clean and assemble the continuous core barrel or split-spoon sampler.

3. Lower the sampler through the drill stem to the desired sampling depth. If using a split-spoon sampler, drive the sampler with a standard 140-pound

hammer free-falling 30 inches in accordance with ASTM Method D1586. Record the number of blows per foot required to drive the split spoon sampler.

4. After the continuous core barrel or split-spoon sampler is retrieved and opened, collect soil samples for chemical analysis. Don a clean pair of disposable gloves immediately prior to sample collection. Collect VOC samples directly from the core barrel or spit spoon sampler using an EnCore™ sampler or equivalent (Terra Core) to minimize sample disturbance. Place the remaining soil sample volume into a stainless steel bowl. Mix the soil using a stainless steel spoon until the sample is visually uniform. Remove any debris or larger rocks from the soil during the mixing process using the spoon. Place the remaining soil samples into their appropriate containers. If the sample material is of size or consistency that an EnCore sampler cannot be used, place the material in a glass 4-ounce container. Immediately store the containers in a cooler on ice at 4º C. Complete the sample label for soil samples selected for analyses.

5. Document the sample on a Soil/Sediment Sample Log.

3.5 Monitoring Well Construction

3.5.1 Shallow and Intermediate Well Construction

The shallow and intermediate wells will be installed in boreholes drilled using hollow-stem auger techniques. Monitoring well construction details will be documented on the appropriate Well Construction Log (Appendix B). No water will be introduced during monitoring well construction unless the borehole conditions require stabilization. If required, the water will be obtained from the Fort Stewart or Hunter Army Airfield potable water system.

1. The screened interval for all monitoring wells is anticipated to be 5- to 10 foot-sections of factory-milled 10-slot, 2-inch O.D., schedule 40 PVC screen, placed in the bottom of each well. The well screen attached to threaded, flush joint, 2-inch O.D., schedule 40 PVC casing will be inserted in the borehole through the minimum 6.25-inch O.D. hollow-stem auger.

2. The screened interval of the monitoring wells will be specified in the Site-Specific Work Plan for each Site.

3. PVC casing will be threaded to the screen and brought to a height of 3 ft above ground level for completion.

4. The annular space between the well and the borehole wall will be backfilled with a clean, graded, size 20 to 40 silica sand pack that will extend from the bottom of the borehole to a minimum of 2 ft above the top of the screened interval. The sand pack will be placed by tremie pipe from the bottom of the borehole through the hollow-stem augers to ensure complete placement around the well screen. The hollow stem auger will be retrieved as the sand pack is emplaced and can typically serve as the tremie pipe for filter pack placement.

5. Approximately 1 ft of very fine sand grade size 50 or smaller may be emplaced above the filter pack to prevent the migration of the bentonite slurry into the well screen.

6. A minimum thickness of 3 ft of bentonite pellets or chips will be placed on top of the filter pack as a seal. If the seal is within the unsaturated zone at the time of installation, granular bentonite will be placed in one-foot lifts, saturated with potable water, and allowed to hydrate. Hydration time will conform to the manufacturer's recommendations before further work on the well is performed.

7. The annular space from the top of the bentonite seal to within 1 foot beneath the frost line (approximately 30 to 36 inches bgs) will be filled with a cement and bentonite slurry containing high solids mixed to the manufacturer's specifications. Alternatively, cement/bentonite slurry consisting of 8 gallons water and 5 percent bentonite by weight per bag of Portland cement will be used, with a target density of 14 to 15 pounds per gallon. The bentonite slurry will be placed with a tremie pipe from the bottom of the annular area to be grouted to ensure proper placement of the slurry.

8. The remaining annular space near land surface will be filled with concrete. All wells will be completed above grade using a protective steel cover. A concrete apron will be installed around the cover. The apron will be a minimum of 2 ft by 2 ft and 6 inches in thickness, and shall be sloped to promote drainage away from the well. The wells will also be equipped with locking caps.

9. At selected locations, steel guard posts or protective barriers will be installed around the wells in a manner designed to prevent vehicles from accidentally damaging the well.

3.5.2 Pre-pack Screen Monitoring Well Construction

For shallow to intermediate monitoring wells where heaving (flowing) sands are expected to be encountered, an alternative method of monitoring well construction would include the use of pre-packed screens during well construction. Figure 3-1 shows the well schematic for the prepacked screens. The construction of these wells would follow the same steps detailed in Section 3.5.1 with the following exceptions.

1. The screened portion of the monitoring well will consist of 5- to 10-foot sections of pre-packed screen. In the case of 2-inch diameter well, the screen will have a 2.0-inch I.D. and a 3.63-inch O.D. Previous site investigations have shown that the 12-slot screen with a 10 by 20 sand pack will be more than adequate for construction of the monitoring well.

2. Formation material will be allowed to collapse around the screen upon removal of the augers to a point 2 ft above the screened interval.

3.5.3 Monitoring Well Construction Beneath a Confining or Semi-Confining Layer

Installation of monitoring wells beneath a confining or semi-confining layer is outlined in the procedures below. Monitoring well construction details will be documented on the appropriate Well Construction Log.

1. An 8-inch PVC casing will be set 1 foot into the top of the confining unit. The casing will then be grouted around the annulus of the casing to the land surface to seal off the casing from the aquifer. The grout will be allowed to set for a period of time in accordance with the manufacturer's specifications to ensure a proper seal is set.

2. Inside of the casing the bore hole will be completed through the confining layer to the aquifer below to the target depth.

3. Inside of the 8-inch casing, the well will be constructed with 2-inch threaded flush joint, Schedule 40 PVC casing and 2-inch threaded flush joint, Schedule 40 PVC, 0.010-inch continuously mill-slotted screen. Schedule 80 well material

will be used for monitoring wells deeper than 100 ft. Pipe joint compound (glue) will not be used in constructing the monitoring wells. If the depth of the well is to be greater than 50 ft, centralizers above the screened interval may be used to aid in well construction.

4. Casing will be added to the well screen and brought from the top of the screened interval to a height of 3 ft above ground level for completion.

5. The annular space between the well and the borehole wall will be backfilled with a clean, graded, size 20 to 40 silica (or alternative gradation based on site-specific data) sand pack that will extend from the bottom of the borehole to a minimum of 2 ft above the top of the screened interval. The sand pack will be placed by tremie pipe from the bottom of the borehole through the hollow-stem augers to ensure complete placement around the well screen.

6. Approximately 1 ft of very fine sand may be emplaced above the filter pack to prevent the migration of the bentonite slurry into the well screen.

7. A minimum thickness of 3 ft of bentonite pellets or chips will be placed on top of the filter pack as a seal. If the seal is within the unsaturated zone at the time of installation, the bentonite will be saturated with potable water and allowed to hydrate. Hydration time will conform to the manufacturer's recommendations before further work on the well is performed.

8. The annular space from the top of the bentonite seal to within 1 foot beneath the frost line will be filled with a cement and bentonite slurry containing high solids mixed to the manufacturer's specifications. The bentonite slurry will be placed with a tremie pipe from the bottom of the annular area to be grouted to ensure proper placement of the slurry.

9. The remaining annular space near land surface will be filled with concrete. All wells will be completed above grade using a protective steel cover. A concrete apron will be installed around the cover. The apron will be a minimum of 2 ft by 2 ft and 6 inches in thickness, and shall be sloped to promote drainage away from the well. The wells will also be equipped with locking caps.

10. At selected locations, steel guard posts or protective barriers will be installed around the well in a manner designed to prevent vehicles from accidentally damaging the well.

3.5.4 Borehole and Well Abandonment

A Georgia licensed water well driller will abandon all boreholes not used for monitoring well installation, temporary wells, or permanent wells in accordance with the OCGA Georgia Well Standards 12-5-134 (State of Georgia, 2008).

3.5.5 Temporary Well Abandonment

Temporary wells will be abandoned by the following procedures.

1. The monitoring well riser pipe and well screen will be removed from each borehole. The riser pipe and screen will be decontaminated by steam cleaning at the designated decontamination area and will be discarded in a sanitary waste landfill.

2. The entire borehole will be grouted with a cement and bentonite slurry containing high solids mixed to the manufacturer's specifications. The bentonite slurry will be placed with a tremie pipe from the bottom of the annular area to be grouted to ensure proper placement of the slurry.

3. The abandoned borehole will be marked with a flag or stake.

3.5.6 Soil Boring Abandonment

The procedures for abandoning boreholes are as follows:

1. The entire borehole will be grouted with a cement and bentonite slurry containing high solids mixed to the manufacturer's specifications. The bentonite slurry will be placed with a tremie pipe from the bottom of the annular area to be grouted to ensure proper placement of the slurry.

2. The abandoned borehole will be marked with a flag or stake to allow for surveying.

3.6 Groundwater Level Measurements and Sampling

3.6.1 Groundwater Level Measurements

Water level measurements will be referenced to a surveyed elevation point located on the top of the well casing. This measurement point will be surveyed by a Certified Land Surveyor and referenced to ft above mean sea level (amsl). An electronic water level probe will be used to gauge the water level in the new wells, in addition to the existing monitoring wells and piezometers at the facility.

Water levels will be recorded in the new monitoring wells, existing monitoring wells and piezometers within 24 hours prior to each groundwater sampling event. The total well depth may also be measured at this time to determine if sediment has accumulated in the well thereby reducing the effective well depth. Water level measurements at each Site will begin with the upgradient wells (i.e., inferred least contaminated wells) and proceed to the downgradient wells (i.e., inferred most contaminated wells). Water-level measurements will be collected within a single 24-hour period and will be measured twice to check the reproducibility of the measurement data. This measurement validation helps ensure accuracy with regard to the water level data collection. The procedure for obtaining water level measurements is as follows:

1. Describe the area surrounding the well, whether or not the lock was secure (if applicable), if the well could have been impacted by surface water runoff, ambient weather conditions and other factors that could affect the final data analysis. This documentation is recorded on a Water Level Measurement Form) Appendix B).

2. Decontaminate the electronic water probe prior to initiating water level measurements and between all wells and piezometers. Decontamination procedures are described in Section 3.12.

3. Unlock the protective casing and remove the inner cap on the riser.

4. Check the probe to verify that it is operational, then lower down the monitoring well.

5. If the well is not vented, allow the water level to equilibrate for a few minutes prior to collecting the first measurement. Take fluid level measurements from a

fixed reference point (the north side of the top of the PVC riser) using an electric tape graduated in 0.01-foot intervals.

6. Repeat the measurements until two measurements are obtained that are within 0.01 ft.

7. Remove and decontaminate the probe, replace the inner cap, and lock the protective casing.

3.6.2 Low-Flow Groundwater Purging and Sample Collection

The following protocol has been developed to obtain groundwater samples that are representative of formation conditions and is intended for use in sampling monitoring wells during the field activities. New monitoring wells will not be sampled for at least 24 hours following non-stressful means of well development (e.g., purging with submersible pump or bailer) and 48 hours following stressful means of well development (e.g., air lift, surge and purge). Monitoring wells will be purged prior to collecting groundwater samples to ensure that representative formation water is being sampled. The monitoring wells will be purged and sampled in the same order as that for water-level measurements (upgradient to downgradient, or least contaminated to most contaminated where known based upon prior sampling results). Prior to introduction into the well, all non-dedicated equipment and materials will be decontaminated in accordance with the procedures outlined in Section 3.12.

The following procedures will be implemented when performing well purging prior to sample collection:

1. Put on clean latex or vinyl surgical gloves or nitrile gloves.

2. Unlock the metal protective casing, remove the well cap, and document the general condition of the well.

3. Determine static fluid-level elevation using electronic probe. Record on Groundwater Sampling Form (Appendix B).

4. Compute the volume of water in the well (0.162 gallon/foot for a 2-inch diameter well). The volume of water to be purged will be computed based on the total well depth recorded upon the completion of well installation. The total depth will be measured periodically during the monitoring program to determine if

sediment has accumulated in the well thereby reducing the effective well volume. If it is determined that sediment has accumulated in the well, then the new well depth will be used to compute the volume of water to be purged.

5. Insert the pre-cleaned bladder (or peristaltic) pump and tubing into the well to the midpoint of the well screen. Record installation time in field notes. Dedicated Teflon and/or PVC bailers may be used to facilitate sample collection where site conditions warrant, such as low recovery wells.

6. Start pump at the lowest possible flow rate and adjust the pumping rate to approximately 100 milliliters per minute (mL/min). Record pump start time in field notes. Verify the flow rate with the graduated cylinder or equivalent by collecting the water from the discharge line for one minute. Record results in field notes. Based on the recovery rate of the well, the pump may need to be raised or lowered to adequately purge the entire well column. Adjustments will be recorded in the field notes.

7. Monitor water level to verify that little or no drawdown (0 to 0.3 ft) is occurring in the well. If desired, the flow rate may be increased to up to 300 mL/min in more permeable formations as long as little or no drawdown is observed in the well. Record measurements and flow rates in field notes.

8. Obtain field parameter measurements (temperature, specific conductance, pH, dissolved oxygen, oxidation-reduction potential [ORP], and turbidity) every 5 minutes and record on the Groundwater Sample Log. Purge until the criteria listed below have been met (unless low well recovery precludes this):

    - The field parameters stabilize to within +/- 10 percent of three consecutive meter readings taken at least 5 minutes apart.

    - The measured turbidity is less than 10 nephelometric turbidity units (NTUs), unless low recovery precludes this.

9. Collect VOC samples for laboratory analysis (if required) at a low flow rate (100 mL/min) directly into the appropriate sample container. If a peristaltic pump is used, the downhole tubing will be filled using suction and removed from the well to prevent the sample from contacting the pump head. The pump speed is reduced and the direction reversed to push the sample out of the tubing and into the sample containers. Ensure that no air bubbles are present in the vial.

Secure sample container lid and store sample containers in chilled cooler after filling out the sample label.

10. Collect additional samples for non-VOC analysis (collecting in the order of explosives, metals, and indicator parameters). If samples are being collected usig a persitaltic pump following VOC sample collection, repeat steps 1 through 8. Collect non-VOC samples at low flow rate (100 mL/min). Flow rates of up to 500 mL/min can be used if all stabilization criteria are achieved. Unless specified in the site-specific work plan, metals samples will be collected unfiltered. If site conditions require filtration for metals analysis, an in-line 45 micron filter will be used. Secure sample container lids and store sample containers in chilled cooler.

11. Complete sampling documentation on the Groundwater Sampling Form, record the collection date and time on the sample key, and fill out the Well Sampling Summary form (Appendix B).

12. If inadequate water is present in the well to fill the required sample containers, return periodically within 24 hours until adequate sample volume is obtained and field parameters measured. Collect groundwater for individual analyses in the appropriate sample order. If required, collect VOCs and store first, then metals and other indicator parameters.

13. If drawdown in the well cannot be maintained within the 0.3-foot requirement, sample collection will be performed after three well volumes of groundwater have been purged. Begin sample collection with VOC analysis unless otherwise noted in the site-specific work plan. For wells that purge dry before all of the samples are collected, allow the well to recover and then make one more attempt to collect the remaining samples within a 24-hour period.

14. Turn off pump. Remove portable pump from well and decontaminate or dispose. Tubing will be left as dedicated tubing in the well or disposed of after use.

15. Determine the total depth of the well. Compare the measurement of the total depth of the well with previous measurements and well construction log to determine available screen length. Record on water sampling log. If more than 20 percent of a well screen is occluded by sediment, the well must be redeveloped prior to collecting future groundwater quality samples. Samples

collected prior to the total well depth measurement will be representative only if the field data indicate that the well met stabilization criteria prior to sampling.

16. Replace cap on well and protective casing lock well.

3.6.3 Slug Test

This procedure defines the requirements for conducting a slug test in a monitoring well. The purpose of this procedure is to provide a uniform basis for conducting slug tests and to ensure the continuity between field personnel. A water level indicator will be used to measure the change in water levels versus time during the slug test. However, for slug tests completed in wells screened in very permeable formations, a transducer and data logger may be used to measure and record water level changes over time.

1. Open the locking and vented caps and inspect the wellhead. Note in particular the condition of the surveyed reference mark, if any.

2. Measure and record the static water level and the depth to the bottom of the well. Record this data on the Water Level/Pumping Test Record (Appendix B).

3. Lower the slug into the water until it is fully submerged. Allow the well to equilibrate to static water level.

4. Verify the static water level has been reestablished with an electronic water-level indicator.

5. Withdraw the slug quickly, but avoid surging. Record the time of withdrawal to the second. Start the stopwatch, if used, at the instant the slug is withdrawn.

6. Using an electronic water level indicator, measure and record the initial displacement of water as soon as the slug has been withdrawn.

7. Measure and record the rise in water level vs. time. Using the water-level indicator and a stopwatch, record depth-time data at the fastest rate possible for the first 5 minutes of well recovery. Generally the water levels should be recorded every 30 seconds for the first 5 minutes, then every minute for the next 5 minutes. Subsequent recording intervals may be adjusted to suit the rate of well recovery. An electronic data logger and pressure transducer may be used in lieu of manual water level measurements.

8. Continue recording depth-time data until the well has recovered to nearly the static water level or at least 90 percent of the static water level. If 90 percent of the static water level has not been achieved within 2 hours, then field personnel may return periodically within the next 24 hours to record the water level.

9. Record the time of test completion in the field data forms.

10. Decontaminate all equipment according to the procedures outlined in Section 3.12. Close and lock the well before leaving.

3.6.4 Constant Rate Pump Test

1. Upon arriving at the site, collect a round of static water levels from all site monitoring wells. Record this data on the Water Level/Pumping Test Record (Appendix B).

2. Place the pump in the pumping well and connect to the electrical service. The pump discharge will be connected to 1) a control valve, 2) inline filter (optional), and 3) flow meter. Dependent on site conditions, treatment systems (i.e., flow-through vessels, carbon units) may be used prior to water storage or discharge.

3. Initiate a short step test beginning at 2 gallons per minute (gpm). The initial step test pumping rate may be altered depending on site specific conditions. The pumping rate will be increased in two subsequent steps (the amount of increase will be determined in the field based on the drawdown achieved at 2 gpm). Measure water levels in the pumping well and the three closest monitoring wells during the step test.

4. Based on the results of the step test, determine a pumping rate that will 1) achieve significant drawdown in the pumping well, and 2) will not result in dewatering the well during the pumping test.

5. Begin the pumping test after the water levels in the pumping well and observation wells have returned to static conditions.

6. Turn on the pump in the test well and operate at a constant rate during the remainder of the test.

7. Collect water levels at a logarithmic interval in the pumping well, monitoring wells within 100 ft of the pumping well, piezometers within 100 ft of the pumping well, and at least one background well. Collect the water levels using a handheld electronic water level indicator or through the use of pressure transducers.

8. After the test has been conducted for a period of 24 hours, evaluate the pump test data to determine if continuation of the pump test is justified. If so, continue the test for a total of 48 hours, or until the data indicate that asymptotic conditions were achieved.

9. When the determination has been made to stop the pumping test, initiate the recovery portion of the test.

10. After the pump has been shut off, measure water levels at a logarithmic interval in the pumping well, monitoring wells within 100 ft of the pumping well, piezometers within 100 ft of the pumping well, and the selected background well. Continue measurements until the water level in the pumping well has recovered at least 90 percent.

3.6.5 LNAPL Bail Down Test

This procedure defines the requirements for conducting an LNAPL Bail Down Test in a monitoring well. The purpose of this procedure is to measure the thickness and depth to free product in the well as it recovers. The results of these tests are analyzed in accordance with techniques described in "How to Effectively Recover Free Product at Leaking Underground Storage Tank Sites," (EPA 510-R-96-001) to assist choice of potential free product recovery methods. The following steps will be used:

1. Measure the depth to LNAPL and groundwater.

2. Remove as much LNAPL from the well as possible using a weighted disposal bailer.

3. Measure the recovery rate of free product and groundwater using a hydrocarbon probe. Record the LNAPL thickness and recovery time in the well at regular intervals until the recovery rate has stabilized.

4. Determine 80 percent of the maximum LNAPL recovery thickness.

5. Interpolate the recovery time for 80 percent recovery.

6. Compute gallons per foot of LNAPL thickness in the well screen.

7. Compute the average recovery rate in gallons per day to 80 percent recovery.

3.7 Test Pit Excavations

The following procedures may be used to install test trenches, if deemed necessary to characterize waste materials.

1. Complete a trench to approximately 4 ft bgs with a track hoe or equivalent piece of excavation equipment.

2. Describe the profile of waste based on visual observations of the material removed from the trench and record on a Boring/Well Construction Log (Appendix B).

3. Backfill the trench with waste material after the trench has been completed.

4. Cover the trench with compacted soil.

5. Mark the trench area with a stake for surveying purposes.

3.8 Sediment Sampling

The following procedures will be used to collect sediment samples during the field activities at the Fort Stewart and Hunter Army Airfield.

3.8.1 Shallow Ditch Sediment Sampling

1. Sediment samples will be collected with a decontaminated stainless steel trowel or hand auger. Decontamination procedures are outlined in Section 3.12. A stainless steel hand auger or trowel will be used to collect sedimentsoils from the 0 to 0.5-foot (6-inch) interval.

2. The sediment sample will be placed directly into a stainless steel bowl. The sediment will be mixed using a stainless steel spoon until the sample is

visually uniform. During the mixing process any debris or larger rocks will be removed using the spoon.

3. The sample will be transferred from the bowl into a laboratory-prepared sampling containers supplied by the laboratory.

4. The sample will be documented on a Soil/Sediment Sample Log and the Soil Sample Summary Form.

Surficial soil samples will be collected from ditch areas that may be dry or have no freestanding water at the time of sampling. The following dry ditch sediment sampling procedures should be used only if the ditch is dry or has no freestanding water:

1. Prior to sample collection, any rocks, vegetation or debris will be removed with a stainless steel trowel.

2. Surficial soil samples will be collected with a decontaminated stainless steel trowel or hand auger. Decontamination procedures are outlined in Section 3.13. A stainless steel hand auger or trowel will be used to collect soils from the 0 to 0.5-foot (6-inch) interval.

3. The soil sample will be placed directly into a stainless steel bowl. The soil will be mixed using a stainless steel spoon until the sample is visually uniform. During the mixing process any debris or larger rocks will be removed using the spoon.

4. The sample will then be transferred from the container into the laboratory-prepared sampling containers supplied by the laboratory. The sampling activities will be documented on a Soil/Sediment Sample Log and the Soil Sample Summary Form.

5. Following sampling, the sample location will be filled in and any removed rocks or vegetation replaced.

3.8.2 Deep Ditch Sediment Sampling

1. Remove overburden with a decontaminated stainless steel bucket auger to just above the top of the prescribed sampling depth.

2. Drive a decontaminated 1 to 2-inch diameter stainless steel soil sampler lined with a plastic or acetate liner an additional 6 inches in depth. A disposable acetate or thin walled stainless steel soil probe may also be used.

3. Use a decontaminated bucket auger to collect the sample from 1.5 to 2.0 ft bgs if a gravelly substrate is encountered.

4. Cap the liner and retract the sampler. The sample core may not remain in the sampler or tube if the top is not capped.

5. Cap the bottom of the sample. If a liner is used, remove the liner from the sampler, then cap the bottom of the sample.

6. If freestanding water was also captured in the sampling tube or liner, remove the top cap and gently pour off the water without disturbing the sediment sample. Place the sediment sample directly into a stainless steel bowl. Mix the sediment using a stainless steel spoon until the sample is visually uniform. Remove any debris or larger rocks from the sediment during the mixing process using the spoon.

7. The sample will then be transferred from the container into the laboratory-prepared sampling containers supplied by the laboratory.

8. Document the sample on a Soil/Sediment Sample Log and the Soil Sample Summary Form.

Subsurface soil samples may be collected from ditch areas that may be dry or have no freestanding water at the time of sampling. The following dry ditch sediment sampling procedures described below should be used only if the ditch is dry or has no freestanding water:

1. Prior to sample collection, any rocks, vegetation or debris will be removed with a stainless steel trowel.

2. A decontaminated stainless steel hand auger will be used to collect soils from the prescribed depth interval. The collected soil sample will be placed directly into a stainless steel bowl. The soil will be mixed using a stainless steel spoon until the sample is visually uniform. During the mixing process any debris or larger rocks will be removed from the soil using the spoon.

3. The sample will then be transferred from the container into the laboratory-prepared sampling containers supplied by the laboratory. The sampling activities will be documented on a Soil/Sediment Sample Log and the Soil Sampling Summary Form.

4. Following sampling, the sample location will be filled in with surrounding sediment.

3.8.3 Shallow Stream Sediment Sampling

Stream sediment samples may be collected along predetermined transects upstream, adjacent to, and downstream of the area of interest in conjunction with surface water sampling for the characterization of the aquatic environment. Please note that the sediment samples may have to be collected by personnel outfitted with waders.

The sediment sampling procedures are described below and assume that all samples can be collected by personnel outfitted with waders that can access all sampling locations on a transect.

1. Position identification markers for the sediment and surface sampling locations along the stream bank prior to sampling. At each transect, mark and stake opposite banks of the stream to support a rope premarked at least at 10-foot intervals or measuring tape pulled taut across the stream slightly above water level. Each tape mark will become a station for a depth sounding of the river and a point for flow velocity measurements. For streams that are 10 ft in width or less, only one sampling station is required at the stream mid-point.

2. Measure the water velocity and flow using a current meter. Measure flow velocity at each station and at each 5-foot depth interval to the base of the stream. In every case, collect a flow measurement at the base and upper surface of the stream.

3. Briefly describe the substrate beneath each station as marked on the rope, such as silt, sand, gravel, and bedrock. In this manner, select the site for sediment sampling. Preferred sediment sample collection locations are areas of deposition, where fine-grained materials, such as clay, silt, or fine sand, collect. In addition, collect samples in pools, rather than riffles. The dredge sampler may not function properly if the substrate being sampled contains a large amount or large pieces of gravel.

4. Approach the sampling location from downstream to avoid disturbing the sediment prior to sampling.

5. Collect the sediment samples using an Ekman or Ponar dredge or equivalent. Gently advance the dredge approximately 6 inches into the sediment. The dredge closes with a messenger weight and the spring-loaded jaws shut to collect the sediment sample. A minimum of three aliquots will be collected at each sampling location.

6. Place the sediment samples directly into a clean stainless steel bowl. If VOC samples are to be collected, they should be taken directly from the sampling device using an EnCore™ sampler or equivalent (Terra Core). If the VOC samples cannot be collected from the sample device, they can be collected immediately after placement of the sediment in the stainless steel bowl. Following VOC sample collection, the remaining sediment will be mixed using a stainless steel spoon until the sample is visually uniform. During the mixing process any debris or larger rocks will be removed using the spoon.

7. Fill the appropriate laboratory jars for the non-VOC parameters specified in the Site-Specific Work Plan. Attach the lids and label appropriately. Complete the Soil Sample Summary Log (Appendix B).

8. With the remaining sediment sample, record the sediment characteristics, such as texture, odor, color, and other distinguishing factors on a Soil/Sediment Sample Log (Appendix B).

9. Remove the rope marking the transect, if not collecting deep sediment samples. Do not remove the stakes marking the transect. Survey the elevation of the stakes to a known elevation datum to provide a depth profile of the river.

3.9 Surface Water Sampling

Surface water samples may be collected along predetermined transects upstream, adjacent to, and downstream of the area of interest in conjunction with stream sediment sampling for the characterization of the aquatic environment. Please note that the surface water samples will have to be collected using a small boat or by personnel outfitted with waders. The optimum time to collect the surface water samples will be at a low stream flow so that personnel outfitted with waders can collect the samples.

Using a boat to collect the samples introduces special health and safety concerns and typically doubles the amount of time required to complete the task.

The surface water sampling procedures are described below and assume that all samples can be collected by personnel outfitted with waders that can access all sampling locations on a transect.

1. Follow steps 1 and 2 outlined in the stream sediment sampling procedure outlined in Sections 3.8.3.

2. At each transect, collect a surface water sample near the top of the water column with a clean Pyrex sampling cup or equivalent for field measurement of temperature, pH, specific conductance, and dissolved oxygen. An equivalent flow-through meter may also be used for each field parameter.

3. At locations that are deeper than 5 ft, collect the field measurements at each 5-foot depth interval using a Van Dorn or Kemmerer Type sampler.

4. Record the field measurements in a Surface Water Sample Log (Appendix B).

5. If the stream does not exhibit thermal or chemical stratification as determined by the field measurements (temperature and pH), collect a surface water sample with a clean Pyrex sampling cup or equivalent near the top of the water column. Immerse the Pyrex cup at an angle such that water gently flows in with minimal disturbance. Use the sample to fill laboratory-prepared sample bottles for analysis.

6. If the stream exhibits thermal or chemical stratification as determined by the field measurements (temperature and pH), then collect surface water samples every 5 ft using a Van Dorn or Kemmerer style water sampler.

7. Record the sampling location, date and time of collection, sample collection method, sample identification, sample preservative, methods of analysis, and initials of the sampling personnel on the Surface Water Sample Log (Appendix B).

8. Decontaminate the sampling equipment as described in Section 3.12.

3.10 Field Analytical Measurements

Several instruments may be used to collect field analytical data. These instruments include a pH meter, specific conductance meter, a thermometer, dissolved oxygen meter, and turbidity meter (nephelometer). The following equipment (including model number and manufacturer) will be used:

- pH meter (model SA-230) manufactured by Orion Research, Inc. or equivalent;
- Specific conductivity meter (model 0148-40) manufactured by Cole-Palmer Instrument Company or equivalent;
- Digital thermometer that meets the National Bureau of Standards requirements;
- Dissolved oxygen meter (model 810) manufactured by Orion Research, Inc. or equivalent; and
- Turbidity meter (model 800) manufactured by Engineered Systems or equivalent.

Field instruments will be calibrated at least once a day, and more often if conditions warrant. Calibration procedures will follow manufacturer's specifications and will be documented by field personnel on the Field Instrument Calibration Log (Appendix B).

3.11 Quality Control Samples

To monitor sampling and laboratory performance it may be necessary to collect several types of field QA/QC samples. The field QA/QC samples include trip blanks, equipment rinsate blanks, and field duplicates. The specific number and type of QA/QC samples that will be collected at each Site are outlined in the Site-Specific Work Plans and may be more or less than the criteria stated below based upon data quality objectives and professional judgment.

A trip blank is a container filled with distilled and organic-free water prepared in, and provided by, the analytical laboratory. A trip blank is sent from the analytical laboratory to the field-sampling site, and is returned to the laboratory for analysis. The trip blank results are used to evaluate whether contamination by VOCs occurred during shipment of samples and/or during container transport. One trip blank is required in each sample cooler transporting samples for VOC analysis.

An equipment rinsate blank is a sample of organic free water (for VOC analyses) poured into, or over, or pumped through the sampling device, collected in the sample bottle, and transported to the laboratory for analysis. Equipment rinsate blanks are used to assess the effectiveness of equipment decontamination procedures.

Equipment rinsate blanks are collected immediately after the equipment has been decontaminated. Equipment rinsate blanks are collected by gently pouring distilled or deionized water over selected clean non-dedicated equipment and collected for laboratory analysis. For example, the equipment rinsate blank for soil and sediment sampling programs will be collected by gently pouring distilled or deionized water over clean core barrels or soil core samplers. The equipment rinsate blank for surface water and groundwater sampling programs will be collected by gently pouring distilled or deionized water over clean non-dedicated bailers or sampling cups. Equipment rinsate blanks will be collected at a frequency of 5 percent of the field samples at critical points in the sampling program, such as the sampling of a background well or the end of the sampling program.

The frequency requirements for collecting equipment rinsate blanks are a minimum of five percent of the environmental samples. The blank shall be analyzed for all laboratory analyses requested for the environmental samples collected at the Site. When an analyte is detected in the equipment rinsate blank the appropriate validation flag, as described in the data validation section, shall be applied to all sample results from samples collected. It should be noted that the laboratory will supply the organic free water. A sample aliquot of the organic free water will be submitted for the analysis of all parameters of interest.

A field duplicate sample is a second sample collected at the same location as the original sample. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. The sample containers are assigned an identification number in the field such that they cannot be identified (blind duplicate) as duplicate samples by laboratory personnel performing the analysis. Specific locations are designated for collection of field duplicate samples prior to the beginning of sample collection. A field duplicate will be collected at a rate of one per twenty samples or one per sampling event, if less than twenty samples.

Field duplicate sample results are used to assess precision, including variability associated with both the laboratory analysis and the sample collection process. Field duplicates will be collected at a frequency of 5 percent of samples collected. Analytical

results for field duplicate will be assessed during the data validation process. Specific locations will be designated for collection of field duplicate samples prior to the beginning of sample collection. Control limits for evaluation of precision for field duplicates will be 40 percent for aqueous samples and 70 percent for soil/sediment samples.

Laboratory quality assurance protocols including the performance of laboratory control samples and matrix spikes relating to method acceptance criteria are included in Section 2.7 of the Site-Wide QAPP (Appendix A). The QAPP also defines the data qualification guidelines for evaluating potential matrix interferences identified during matrix spike analyses. The parent and field duplicate sample will be included in all reporting.

3.12 Field Equipment Decontamination

The cleaning procedures outlined in this section will be used by all personnel to clean sampling and other field equipment to prevent cross-contamination during separate phases of the investigation. Documentation regarding decontamination will be recorded on the Daily Log (Appendix B). Specific cleaning procedures are presented in the following section.

A decontamination area will be established where steam cleaning of the drilling and well construction equipment and materials can occur and containment and proper disposal of wash water is possible. An impervious decontamination area will be utilized and the water used to clean the equipment will be containerized for offsite disposal.

3.12.1 Cleaning Materials

The laboratory detergent used to wash the equipment will be a standard brand of phosphate-free laboratory-grade detergent such as Micro or Liquinox. The use of any other detergent must be justified and documented in the field logbooks and inspection or investigative reports.

Potable water is defined as tap water fit for human consumption from a known source. Deionized water is defined as tap water that has been treated by passing through a standard deionizing resin column. The deionized water should contain no metals or other inorganic compounds (i.e., at or above analytical detection limits). The brushes used to clean equipment as outlined in the following sections, will be stiff plastic bristled and will not be wire-wrapped.

3.12.2 Marking and Segregation of Used Field Equipment

Field or sampling equipment that needs to be repaired shall be identified with a tag indicating date repair requested, problem if known, personnel requesting repair, and if the equipment has been decontaminated. Field equipment needing cleaning or repairs will not be stored with clean equipment or sample containers. Field equipment and/or disposable sample containers that are not used during the course of an investigation may not be placed in storage without being recleaned unless it is the opinion of the field investigator that the materials have not become contaminated during the course of the field investigation. However, equipment and sample containers must be labeled as such.

3.12.3 Safety Procedures to be Utilized During Cleaning Operations

The materials used to implement the cleaning procedures outlined in this section can be dangerous if improperly handled. Caution must be exercised by all personnel, and all applicable safety procedures shall be followed. At a minimum, the following precautions will be taken in the field during these cleaning operations:

- Safety glasses with side shields or goggles, and latex or vinyl surgical gloves or nitrile rubber gloves will be worn during all cleaning operations;
- All rinsing operations will be conducted in the open (never in a closed room); and
- No eating, smoking, drinking, chewing, or any hand-to-mouth contact shall be permitted during cleaning operations.

3.12.4 Storage of Field Equipment and Sample Containers

Decontaminated field and sampling equipment will be stored in covered containers or wrapped in aluminum foil to minimize contamination. All decontaminated equipment, when not in use, will be kept in a designated storage area. Sampling equipment and sample containers will not be stored or transported with any gasoline, diesel, or other fuel containers or gasoline or diesel fuel powered equipment. Decontaminated equipment shall be clearly identified by labeling the wrapping material. Field equipment and reusable sampling containers requiring cleaning or repairs shall not be stored with clean equipment. Instead, equipment requiring repairs will be clearly identified and the repairs documented on the daily field log. Field equipment that requires cleaning

will be segregated from clean equipment and will be stored on plastic sheeting pending cleaning.

3.12.5 Cleaning Procedures

3.12.5.1 Drilling and Direct Push Equipment

All drilling and direct push equipment used during completion of soil borings or installation of the monitoring wells will be steam-cleaned prior to initiating drilling or direct push activities. This will include, but is not limited to, the drill stem, augers, drill bits, direct push rods, core barrels, and tools utilized by the contractor.

The drill rig or direct push rig utilized for the installation of the borings and wells will be decontaminated at the decontamination area prior to the initiation of the drilling or direct push activities. The drill rig or direct push rig itself will not be decontaminated between soil boring or monitoring well locations. Augers and other drilling, direct push, or sampling equipment will be returned to the decontamination area to be cleaned after each use. Cleaning of equipment will be performed using a high-pressure steam cleaner to prevent cross-contamination of the soil borings and monitoring wells. Potable water for steam cleaning will be obtained from the installation water supply system.

Tools and equipment used to measure the depth of well completion materials and water levels (i.e., measuring tapes, electric/electronic probes, tampers, tremie pipes) also will be decontaminated by steam cleaning between well locations to avoid cross-contamination. All equipment and tools will be isolated from contact with the ground by placing them onto sheets of polyethylene plastic.

3.12.5.2 Teflon™, Stainless Steel, or Glass Field Sampling Equipment

When Teflon™, stainless steel, or glass sampling equipment is used to collect samples that contain hard to remove materials, it may be necessary to steam clean the field equipment before proceeding with Step 1. If the field equipment cannot be cleaned utilizing these procedures, it should be discarded.

1. Wash equipment thoroughly with laboratory detergent and tap water using a plastic brush to remove any particulate matter or surface film.

2. Teflon™, stainless steel, or glass sampling equipment will be rinsed thoroughly with potable water from an approved onsite source.

3. Rinse thoroughly with analyte free water.

4. Rinse thoroughly with solvent. Do not solvent rinse PVC or plastic items.

5. Rinse thoroughly with organic/analyte free water. If organic/analyte free water is not available, equipment should be allowed to completely dry. Do not apply a final rinse with analyte water.

6. Wrap equipment completely with aluminum foil or store in Ziploc™ plastic bags to prevent contamination during storage and/or transport to the field.

3.12.5.3 Other Sampling Equipment

Miscellaneous sampling equipment will be washed with laboratory detergent, rinsed with potable water, followed by a thorough deionized water rinse, and dried before being stored. This procedure is not used for any equipment utilized for the collection of samples for trace organic compounds analyses.

3.12.5.4 Trace Organic Sampling Equipment

The following procedures are to be used for all sampling equipment used to collect routine samples undergoing trace organic or inorganic constituent analyses:

- Clean with tap water and soap using a brush if necessary to remove particulate matter and surface films. Equipment may be steam cleaned (soap and high pressure hot water) as an alternative to brushing. Sampling equipment that is steam cleaned should be placed on racks or saw horses at least two ft above the floor of the decontamination pad. PVC or plastic items should not be steam cleaned;

- Rinse thoroughly with tap water;

- Rinse thoroughly with analyte free water;

- Rinse thoroughly with solvent. Do not solvent rinse PVC or plastic items;

- Rinse thoroughly with organic/analyte free water. If organic/analyte free water is not available, equipment should be allowed to completely dry; and

- Remove the equipment from the decontamination area and cover with plastic. Equipment stored overnight should be wrapped in aluminum foil and covered with clean, unused plastic.

3.12.5.5 Field Analytical Equipment and Other Field Instruments

The exterior of sealed, watertight equipment should be washed with a mild detergent (for example, liquid dishwashing detergent) and rinsed with tap water before storage. The interior of such equipment may be wiped with a damp cloth if necessary. Other field instrumentation should be wiped with a clean, damp cloth. Conductivity probes, pH meter probes, etc., should be rinsed with deionized water before storage.

3.12.5.6 Ice Chests and Shipping Containers

If the ice chests (labeled accordingly for sampling use) and reusable containers that will be used to store or ship samples and sample containers are believed to be contaminated, the containers should be washed with laboratory detergent (interior and exterior) and rinsed with potable water and air dried before storage. In the event that an ice chest or other reusable container becomes severely contaminated with concentrated waste or suspected hazardous material, it shall be cleaned as thoroughly as possible, rendered unusable, and disposed of properly.

3.12.6 Disposable Materials

Disposable materials generated from the decontamination and sampling activities will be contained in plastic garbage bags. These materials include, but are not limited to gloves, Tyvek suits, latex booties, paper and plastic. A waste determination will be made on a site by site basis for the disposable materials generated during the sampling programs. The waste determination will be based on both process knowledge of the contents of the site and on existing analytical data from the site, if available. The wastes will be disposed off-site in accordance with all applicable federal and state regulations.

3.13 Characterization and Disposal of Investigative Derived Wastes

Investigative derived wastes (IDW) including soil and waste cuttings and decontamination, development, and purge water will be collected and characterized with the procedures described below.

3.13.1 Soils/Sediment/Waste

Soil, sediment, and waste cuttings (not including material excavated from test trenches during waste characterization) will be collected at the borehole and stockpiled on plastic sheeting or placed in appropriate containers, such as a roll-off box or 55-gallon drum for temporary storage. The temporarily stored solid material will be covered to prevent runoff.

Specific disposal options will be made on a site by site basis, taking into account the types of compounds known to be present, and will conform to applicable installation, local, state, and federal requirements.

3.13.2 Water

Investigative derived water, which will consist of decontamination wash, well development, and purge water, will be temporarily containerized in a portable poly tank. Based on previous and/or current analyses, liquids that would not fail Toxicity Characteristic Leaching Procedure (TCLP) analysis will be properly disposed of in accordance with Georgia State laws. Disposal options will be evaluated on a site by site basis.

3.14 Site Survey

A site survey will be conducted by a registered land surveyor to measure elevations (X, Y, and Z coordinates) of any new monitoring wells. The north side of the top of the casing and the land surface adjacent to each well will be surveyed relative to mean sea level to the nearest 0.01 ft. The horizontal location of each monitoring point and well will also be determined relative to the Georgia state plane system and the Fort Stewart and Hunter Army Airfield installation grid to the nearest 1.0 foot. All surveying will be performed by a certified land surveyor, and will be tied into the existing on-site benchmark.

The location of each soil and waste boring, test pit location, sediment, surface water, and stream gauging location may also be surveyed by hand-held global positioning system (GPS) equipment, as conventional land surveying will be difficult to complete at these areas.

4. Field Documentation Procedures

Information on the sample designation, field documentation, COC, and sample shipment activities are discussed in the following three sections.

4.1 Sample Designation

A numbering system was developed for each type of environmental sample collected during the field investigation for the unique identification of each individual sample. This number system will provide a tracking procedure to allow ease of data retrieval, reduction, and evaluation, and to ensure that sample identifiers are not duplicated. The most important aspect of any sample numbering system that is developed is ensuring the uniqueness of an individual sample number. A listing of the sample identification numbers will be maintained by the project manager and the field task supervisor will ensure that it is universally applied to samples collected during the project.

The numbering system for this project consists of the following components described below:

- The Site number in the format “HA##” for Hunter Army Airfield and “FS##” for Fort Stewart;
- The location type;
- The sample number;
- Water and sediment sample IDs will end with the date (in “mmddyy” format); or
- Soil samples will end with the depth range (in ft).

Blind duplicate samples will be labeled sequentially starting at 1 in the form D1(mmddyy).

Examples of the numbering system are provided below:

- Surface water sample 1 taken from HAA-01 on November 8, 2009 would be: HA01SW001(110809);

- Surface soil sample 4 taken from FST-13 at a depth of 0 to 6 inches would be: FS13SS004(0-0.5).

The location type codes are listed below:

MW – monitoring well;
TW – temporary well;
SB – soil boring (by drilling);
SS – surface soil by trowel or other hand collection method;
SW – surface water by any collection method; and
SE – sediment by any collection method.

In addition to the above nomenclature, the COC will be completed to include both the Sample Type and Sample Matrix using the codes defined below:

Acceptable sample type codes are listed below:

N = normal or primary sample;
FD = field duplicate;
EB = equipment blank;
MS = matrix spike;
SD = matrix spike duplicate; and
TB = trip blank.

The sample matrix will be identified using the following codes:

SO = soil sample;
SE = sediment sample;
WG = groundwater;
WS = surface water;
WB = water collected from borehole or during Geoprobe® investigation; and
WL = leachate.

Field duplicate samples will be given a unique number that is completely different from the original sample following the normal sample pattern. Duplicate samples will be labeled sequentially starting at 1 in the form D1(mmddyy). This number will be recorded in the field logbook, so that the duplicates can be identified at a later date. Samples collected with an additional volume for matrix spike/matrix spike duplicates (MS/MSDs) will be designated on the COC in the remarks column.

Equipment and trip blanks will be identified using the sample type code (i.e., EB or TB) followed by the date as MMDDYY. For trip blanks, if more than one trip blank is submitted to the laboratory on a given day, the sample code will be followed by the a number starting with 1. For example the second trip blank submitted on December 1, 2003 would be identified as follows: TB2(120103).

4.2 Field Activity Documentation

Documentation of field operations and sample custody is achieved through use of ARCADIS pre-printed forms and a bound field logbook. The field log consists of notes and drawings describing the location, field conditions, and method of sample collection and identification. Examples of the pre-printed forms that will be used for this project are provided in Appendix B.

All aspects of sample collection and handling as well as visual observations shall be documented on the forms or in the field logbooks. All sample collection equipment (where appropriate), field analytical equipment, and equipment utilized to make physical measurements shall be identified in the field logbooks. All calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment shall be recorded on the forms or in the field logbooks.

In addition, the Field Operations Leader will fill out a daily site activity log that details the activities and/or issues that occurred that day.

All entries in field logbooks or the preprinted sampling logs shall be dated, legible, and contain accurate and inclusive documentation of an individual's project activities. At the end of each day's activity, or of a particular event as appropriate, all documents in the field will be secured by the Field Operations Leader for each task. Once completed, these field logbooks and/or preprinted forms will be maintained as a part of the project files.

All data forms will be completed in indelible black ink. Make an entry in each blank. Where there is no data entry, enter "UNK" for Unknown, "NA" for Not Applicable, or "ND" for Not Done. To change an entry, the person making the change will draw a single line through the mistake, add the correct information above or adjacent to it, and initial the change.

4.2.1 Utilities and Structures Checklist

The Field Operations Leader will check the proposed drilling, sampling, and trenching locations for marked underground utilities, other underground structures and above-ground pipe racks or power lines. A Utilities and Structures Checklist will be completed by the Field Operations Leader for each area to be sampled prior to commencement of field activities.

4.2.2 Location Sketch

All drilling, sampling, and trenching locations will be drawn on a Location Sketch, if a reasonable site map is not available for the area of interest.

4.2.3 Boring/ Well Construction Logs

All soil borings, boreholes, and monitoring well installations completed by the field team will be documented on Boring/Well Construction Logs. The logs document the drilling location, drilling dates and times, drilling personnel, logging personnel, soil descriptions, sample depths, recovery, boring location and volatile organic vapor content. The log also documents the well identification, drilling method, development technique, well construction materials, material depths, and abandonment, if any.

4.2.4 Water Level Measurement Form

All water level measurements will be recorded on a Water Level Measurement Form. The log identifies the measurement location, and measurement date and time.

4.2.5 Sample Key

All samples to be collected will be recorded on the Sample Key. The form identifies all sample locations, sample date and time, and analytical parameters to be collected.

4.2.6 Sampling Location Survey Summary

The sampling location survey summary is to be completed prior to field activities. It will provide northing, easting, and elevation information for site monitoring wells.

4.2.7 Water Sample Log

All surface water samples collected by the field team will be documented on a Water Sample Log. The log identifies the sample identification, duplicate identification, if any, sampling times, location, equipment used, color, odor, appearance, sample parameters, container description, sample preservative, and sampling personnel.

4.2.8 Groundwater Sampling Form

The results of field measurements while purging monitoring wells, prior to collecting a groundwater sample, will be recorded on the Groundwater Sampling Form. This form records time series measurements of conductivity, temperature, turbidity, redox potential, and dissolved oxygen. The form also provides a record of the volume of water purged prior to sample collection.

4.2.9 Well Sampling Summary

A summary of the results of field measurements while purging monitoring wells, prior to collecting a groundwater sample, will be recorded on the Well Sampling Summary Form. This form records collection date and time and the final measurements of conductivity, temperature, turbidity, redox potential, and dissolved oxygen. The form also provides a record of the volume of water purged prior to sample collection.

4.2.10 Water Level/Pumping Test Record

The data from slug tests and pumping tests completed in monitoring wells will be documented on a Water Level/Pumping Test Record. The log identifies the well the test is conducted in, the static water level, the initial displacement, and changes in the water level versus time.

4.2.11 Soil/Sediment Sample Log

All soil samples collected by the field team will be documented on a Soil/Sediment Sample Log. The log identifies the sample identification number, soil type, duplicate

identification, if any, sampling times, depth and location of sample, sampling equipment used, color, odor, appearance, sample parameters, container description, sample preservative, and sampling personnel.

4.2.12 Soil Sampling Summary

All soil samples collected by the field team will be documented on Soil Sampling Summary form. The form identifies the sample identification, sampling times, depth and location of the sample.

4.2.13 Surface Water Sample Log

All surface water samples collected by the field team will be documented on a Surface Water Sample Log. The log identifies the sample identification, duplicate identification, if any, sampling times, sampling location, equipment used, color, odor, appearance, sample parameters, container description, sample preservative, and sampling personnel.

4.2.14 Field Instrument Calibration Form

The field team will record all daily calibration results for field instrumentation on the Field Instrument Calibration Form.

4.2.15 Daily Log

The Daily Log form is used by the Site Manager to record all pertinent sampling events, field observations or other information pertinent to the field effort. The following types of information are generally entered into the Daily Log:

- Date
- Client
- Field Location
- Ambient Weather Conditions
- Field Team
- Instrument Problems
- Site Visitors
- Delays
- Unusual Situations
- Well Damage
- Accidents
- Work Progress
- Quality Control
- Site Schedule

4.2.16 Sample Label

All samples collected by the field team will be properly identified by labeling. Labels will be affixed to the sample bottle prior to the filling of the container(s). Labels are never affixed to lids or caps, although the sample identification information may duplicated on the cap for ease of sample identification. The following labeling information is supplied for every sample bottle.

- Sample Identification Number
- Initials of Sample Collector
- Date and Time of Collection
- Project Number
- Project Location
- Requested Analyses

4.2.17 Chain-of-Custody Form

The COC form is a multi-copy record, which documents the custody of the samples from sample collection through laboratory analysis. It has spaces for signatures of those receiving and relinquishing the samples. The sampler, the individual preparing the samples for shipment, and the receiving individual at the laboratory normally sign the form. An example of this form is provided in Appendix B.

The field personnel collecting the sample will fill out the COC forms. The COC process will be initiated upon sample collection. The field personnel who sign the form will be responsible for the samples until they are transferred to the custody of the laboratory or another custodian. Once the form has been completed, all remaining field sample identification spaces will be crossed through to prevent unauthorized addition of sample information.

The information required on the COC form includes the complete sample identification, date and time of sample collection, number of sample containers, analyses and method required, container type, project number, sample collection personnel, complete name, address, and telephone number of the person analytical reports will be sent to, turnaround time, and signatures of all sample custodians, excluding shippers, such as Federal Express. In addition, the method of shipment, courier name and air bill number must be included. The back copy of the form will be retained. The original form will accompany the sample shipment to the laboratory.

4.2.18 Chain-of-Custody Seal

All coolers submitted to analytical laboratories containing samples collected during the field investigations will be sealed with two signed and dated COC seals. The seals ensure that the samples have not been tampered with during shipment.

4.2.19 Bill of Lading

A bill of lading (air bill) documents receipt of the samples by the carrier. It is not possible for the carrier's representative to sign the COC because it is sealed in the ice chest. Bills of lading are kept on file as part of the sample COC documentation.

4.3 Chain-of-Custody Procedures

The primary objective of the COC process is to create an accurate written record that can be used to trace the possession and handling of the sample from the moment of its collection through analysis. A sample is considered to be in custody when one of the criteria listed below has been satisfied:

- The sample is in one's actual possession.
- The sample is in one's view after being in one's physical possession.
- The sample is in one's physical possession and is then locked up so that no one can tamper with it.
- The sample is kept in a secured area that is restricted to authorized personnel.

Strict COC procedures will be followed for all collection, handling, and shipping of environmental samples. The field personnel are responsible for the care and custody of the sample collected until the samples are properly and formally transferred to another person or a courier for shipment to the laboratory. To simplify the COC record, as few people as possible will handle the sample during the investigation or inspection and an inventory of the sample containers will be maintained.

A COC form will be completed for all samples collected. A separate COC record will be utilized for each cooler of samples shipped to each laboratory used during this investigation. During the data validation activities, it will be determined whether these procedures were adequately followed.

4.3.1 Transfer of Custody

A COC form will accompany all samples. Prior to shipment or transfer of custody, all samples will be maintained in the custody of the Field Operations Leader. Upon transfer of custody, the Field Operations Leader will verify the information on each sample label and assure that each container is intact and sealed. The Field Operations Leader will then sign and date the COC form. The individuals receiving the samples shall sign, date, and note the time that they reviewed the samples on the COC form. This form documents transfer of custody of samples from the field investigator to another person to the laboratory.

4.3.2 Sample Preparation and Shipment

All samples will be stored at approximately 4°C from immediately after collection until analysis. In the field and during transportation to the laboratory, samples will be kept in coolers on ice, not "blue ice". Ice for coolers will be double-bagged in self-sealing plastic bags. Protective foam or Styrofoam packing will be used to minimize the risk of breakage during transport. When packaging samples for commercial transport, individual bottles will be wrapped separately in padded materials.

The samples are then placed in an ice chest, in direct contact with the ice, lined with a plastic trash bag or other barrier to prevent leakage and Styrofoam, bubble wrap, or similar packaging to prevent breakage. The top two copies of the original COC form will be placed in a plastic bag secured inside the shipping container closed with a chain-of-custody seal.

4.3.3 Laboratory Sample Receiving

After the ice chests are delivered to the laboratory, the samples are logged in, the COC is signed, and the samples are checked for breakage or leakage. The temperature of the ice bath is checked. If the temperature exceeds 4º C or if any other problems are noted, this information is recorded on the COC and the Field Operations Leader or Project Manager will be notified of the problem.

5. References

American Society for Testing and Materials (ASTM) International, 1991. *ASTM D-2488-84, Practice for Description and Identification of Soils (Visual – Manual Procedures), Annual Book of ASTM Standards, American Society for Testing and Materials, Philadelphia, vol. 04.08* 1991.

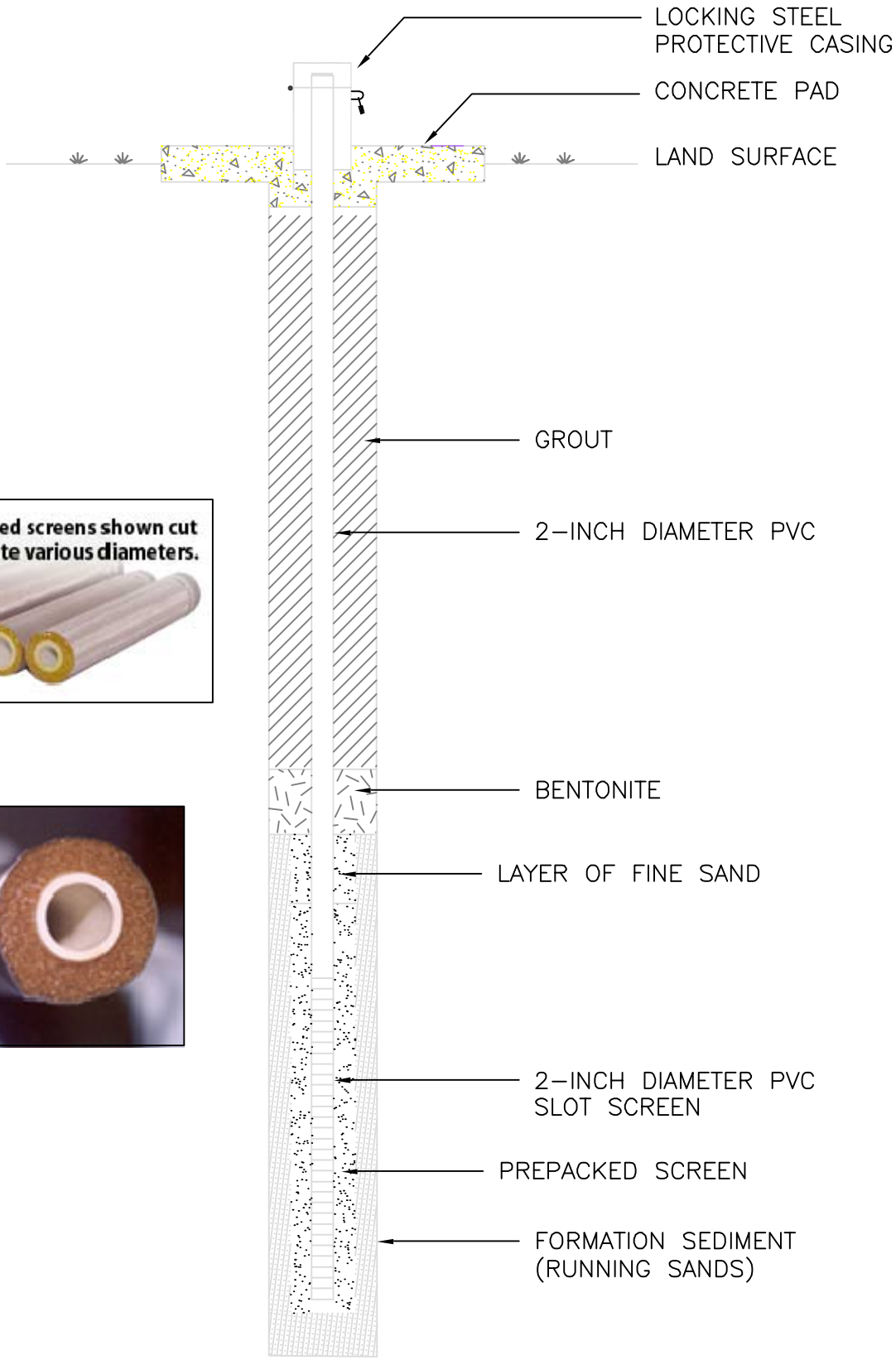
Oficial Code of Georgia Annotated (OCGA), 2008. *Georgia Well Standards 12-5-134* (State of Georgia, 2008).

United States Environmental Protection Agency (USEPA), 2008. Field Branches Quality Systems and Technical Procedures, http://www.epa.gov/region4/sesd/fbqstp/. November 2008.

USEPA, 1996. *"How to Effectively Recover Free Product at Leaking Underground Storage Tank Sites*," (EPA 510-R-96-001), September 1996.

ARCADIS

Figure



NOT TO SCALE

ARCADIS	PRJT MANAGER: / CHECKED BY:	WELL SCHEMATIC FOR WELL WITH PREPACKED SCREEN	FIG–NO 3-1
	DRAWING:		
	PRJT NO:		
	DWG DATE: / DRAFTER:		

ARCADIS

Appendix A

Site-Wide QAPP

ARCADIS
Infrastructure, environment, facilities

Appendix A:

Quality Assurance Project Plan (QAPP)

Fort Stewart Military Reservation and Hunter Army Airfield, Georgia

February 2009

ARCADIS

Jane Kennedy
Project Chemist

Charles A. Bertz, PE
Senior Project Manager

Kurt Beil, PE
Quality Assurance Manager

Appendix A: Quality Assurance Project Plan

Fort Stewart Military Reservation
and Hunter Army Airfield
Georgia

Prepared by:
ARCADIS
801 Corporate Center Drive
Suite 300
Raleigh
North Carolina 27607
Tel 919.854.1282
Fax 919.854.5448

Our Ref.:
GP08HAFS.SW00

Date:
February 3, 2009

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential, and exempt from disclosure under applicable law. Any dissemination, distribution, or copying of this document is strictly prohibited.

ARCADIS

Table of Contents

Fort Stewart Military Reservation
and Hunter Army Airfield

Revision 0

1. Project Management 1

1.1 Project 1

Technical Staff 4

Laboratories 4

1.2 Problem Definition/Background 6

1.3 Project Description 6

1.4 Data Quality Objectives for Measurement Data 7

1.4.1 Precision, Accuracy, Representativeness, Completeness, and Comparability 7

1.4.2 Objectives for Laboratory Analyses 9

1.4.3 Objectives for Field Measurements 9

1.5 Specialized Training and Certification 10

1.6 Documents and Records 11

1.6.1 Document Control 11

1.6.2 Field Documentation 11

1.6.3.1 Corrections to Field Documentation 12

1.6.3.2 Photographs 12

1.6.3 Laboratory Data Reporting/Record Retention 12

1.6.4 Electronic Data Retention 13

2. Data Generation and Acquisition Elements 14

2.1 Sampling Process Design 14

2.2 Sampling Methods 14

2.3 Sample Handling and Custody 14

2.4 Sample Containers 15

2.5 Sample Preservation and Holding Times 15

2.6 Analytical Methods 16

2.6.1 Standard Laboratory Analytical Procedures 16

2.7 Elements of Quality Control 17

2.7.1 Laboratory Control Samples 18
2.7.2 Matrix Spike and Matrix Spike Duplicate 18
2.7.3 Surrogates 19
2.7.4 Internal Standards 19
2.7.5 Retention Windows 20
2.7.6 Method Blank 20
2.7.7 Equipment Blank 21
2.7.8 Trip Blank 21
2.7.9 Field Duplicates 21
2.8 Instrument/Equipment Testing, Inspection, and Maintenance 22
2.8.1 Maintenance Schedules 22
2.8.2 Spare Parts 22
2.9 Instrument/Equipment Calibration and Frequency 23
2.10 Inspection/Acceptance of Supplies and Consumables 23
2.11 Non-Direct Measurements 23
2.12 Data Management 24
2.12.1 Electronic Data Management 24
2.12.2 Field Data Review 25
2.12.3 Laboratory Data Review 25
2.12.3.1 Laboratory Internal Review 26
2.12.3.2 Analytical Report and Data Management 26
2.12.4 Archiving 27
3. Assessment and Oversight 28
3.1 Assessment and Response Actions 28
3.1.1 Peer Review 28
3.2 Corrective Action 28
3.3 Performance and Data Quality Reports 29
4. Data Validation and Usability 30

4.1 Data Review, Verification, and Validation 30

4.2 Verification and Validation Methods 30

4.2.1 Evaluation of Completeness 31

4.2.2 Evaluation of Compliance 32

4.2.2.1 Tier 2 Verification 32

4.2.2.2 Tier 3 Validation 33

4.2.3 Data Validation Reporting 34

4.2.4 Validation Reports 34

4.3 Reconciliation with Data Usability Requirements 35

5. References 37

Tables

A-1 ARCADIS Technical Team Contact Information

A-2 Project Data Quality Objectives

A-3 Statistical Calculations

A-4 Field Data Quality Objectives and Field QC Collection Frequency

A-5 Method, Containers, Preservation, and Holding Times

A-6 Laboratory Quality Control Sample Frequency

Figure

A-1 Project Organization

Acronyms and Abbreviations

Air Toxics	Air Toxics, Ltd.
ARCADIS	ARCADIS U.S., Inc.
AOC	Area of Concern
APM	Associate Project Manager
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
COC	Chain-of-Custody
DoD	Department of Defense
DQO	Data Quality Objectives
DQM	Data Qualification Module (Earthsoft ®)
DRMO	Defense Reutilization Market Office
EB	Equipment blank
EDD	Electronic data deliverable
FHSO	Field Health and Safety Officer
GA EPD	Georgia Environmental Protection Division
GIS	Geographic Information System
HAAF	Hunter Army Airfield
HSP	Health and Safety Plan
HSRA	Hazardous Site Response Act
HSWA	Hazardous and Solid Waste Amendments
IRP	Installation Restoration Program
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
LTO	Laboratory Task Order
MDL	Method detection limit
Microseeps	Microseeps Laboratories, Inc.
MNA	Monitored natural attenuation
MS	Matrix spike
MSD	Matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
NFG	National Functional Guidelines
PARCC	Precision, accuracy, representativeness, completeness, and comparability

PBA	Performance Based Acquisition
PM	Project Manager
PMP	Project Management Plan
PT	Performance Testing
QA	Quality Assurance
QAO	Quality Assurance Officer
QAM	Quality Assurance Manual
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCP	Quality Control Plan
% R	Percent recovery
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group
SOPs	Standard Operating Procedures
SOW	Scope of Work
SWMU	Solid Waste Management Unit
TB	Trip blank
USAEC	United States Army Environmental Command
USEPA	United States Environmental Protection Agency
USTMP	Underground Storage Tank Management Program
VOCs	Volatile organic compounds

Introduction

The Installation Restoration Program (IRP) activities at Fort Stewart and Hunter Army Airfield (HAAF) are performed in accordance with the provisions of the Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984. The Georgia Environmental Protection Division (GA EPD) issued Hazardous Waste Management Permit No, HW-045(S) which addresses the corrective action requirements for all Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at Fort Stewart. Hazardous wastes generated at HAAF are transferred to the Fort Stewart Defense Reutilization Market Office (DRMO) yard. Corrective action activities performed at HAAF are executed under either the Georgia Hazardous Site Response Act (HSRA) or the Georgia Underground Storage Tank Management Program (USTMP). The goal of the Performance Based Acquisition (PBA) contract is to meet the corrective action requirements for all sites, as defined in the contract and summarized in the Project Management Plan (PMP) (ARCADIS 2008). The full scope of services for this contract is defined in the Contract W91ZLK-05-D-0015: Task 0003 as executed between the Army Environmental Command (USAEC) and ARCADIS U.S., Inc. (ARCADIS). All work performed under the contract will be consistent with all applicable regulatory requirements, and relevant Department of Defense (DoD) and Army policy.

This Quality Assurance Project Plan (QAPP) presents the policies, organization, functions, and Quality Assurance (QA) requirements designed to achieve the data quality objectives for additional contaminant delineation, groundwater monitoring, and remedial attainment to be performed in support of the environmental restoration as identified in the PBA contract This QAPP has been prepared for use by field personnel, data quality reviewers, and laboratories who perform environmental activities to ensure that the data are scientifically valid and usable for the intended purpose. Analytical protocols and documentation requirements will ensure that the data are collected, reviewed, and analyzed in a consistent manner. The method performance criteria and the analytical laboratory quality management program, as well as the protocols set forth in this QAPP, will be employed to establish data usability.

The general guidelines followed in the preparation of this QAPP are presented in EPA Requirements for QAPPs for Environmental Data Operations, EPA QA/R-5 (United States Environmental Protection Agency [USEPA], March 2001). The EPA document was used as guidance and this QAPP presents only the applicable components. Other documents that have been referenced in this QAPP are presented in Section 5.

Personnel participating in the work effort will review this document. All personnel are required to comply with procedures documented in this QAPP and supporting project documents to ensure usability of the data produced.

1. Project Management

1.1 Project

This section provides a description of the ARCADIS organizational structure of personnel involved with this project. The lines of authority are defined and key personnel identified for various activities of the project. The project organization is illustrated in Figure A-1. Table A-1 presents contact information for key ARCADIS personnel. The Project Manager will communicate with the client and regulatory agencies and oversee project execution. The Associate Project Manager and Site Managers will implement project tasks and coordinate with the technical personnel.

ARCADIS, Project Manager

Mr. Charles A. Bertz, P.E.. The ARCADIS Project Manager (PM) is responsible for the overall implementation of the project. The Project Manager is responsible for allocating resources to assure successful execution and completion of the scope of work (SOW). Other duties, as required, may include:

- Approving project-specific procedures and internally prepared plans, drawings, and reports;
- Ensuring technical, schedule, and budget requirements are met;
- Coordinating manpower and other necessary resources with ARCADIS Assistant Project Manager, Site Managers, and technical personnel;
- Reviewing project progress;
- Reviewing all final documents, plans, and drawings; and
- Coordinating document delivery and attaining project milestones.

ARCADIS, Associate Project Manager

Ms. Shelley Gibbons. The ARCADIS Assistant Project Manager (APM) will support the Project Manager in contract management as well as task implementation, document preparation, personnel coordination, and budget management. Ms. Gibbons will perform a key role in ensuring compliance with quality performance objectives. Other duties, as required, may include:

- Coordinating schedules and deliverables with the Site Managers and the Project Manager;
- Ensuring project budget and deliverable schedule compliance;
- Assisting with quality program implementation and coordinating document preparation and submittals;
- Serving as the "collection point" for the project staff reporting any changes or deviations from the project work plan;
- Determining the significance of these changes or deviations to specific work plans and the appropriateness of reporting such items to the corresponding regulatory and facility representatives;
- Arranging subcontractor services; and
- Preparing status update reports and revisions to the project work plan.

ARCADIS, Site Managers

Mr. Andy Davis, P.E. and Mr. Scott Bostian, P.E.. The ARCADIS Site Managers are principally responsible for overseeing day-to-day of task performance including all technical and administrative operations. Other duties required may include:

- Preparing the work plans;
- Selecting and monitoring technical staff;
- Assigning duties to the project staff and orienting the staff to the requirements of the project;
- Coordinating and scheduling field activity resources;

- Performing assessment and oversight duties as described in the PMP, Sampling and Analysis Plan (SAP), and QAPP;
- Reviewing and approving all final reports and other work products;
- Monitoring staff and subcontractor progress; and
- Distributing the QAPP to the ARCADIS technical staff.

ARCADIS, Quality Assurance Officer

Mr. Kurt Beil, P.E.. The ARCADIS Quality Assurance Officer (QAO) is responsible for oversight of all QA/QC activities. He will remain independent of day-to-day direct project involvement, but will have the responsibility for ensuring that all project and task-specific QA/QC requirements are met. He will have direct access to corporate staff, as necessary, to resolve any QA/QC problems, disputes, or deficiencies. The QA Officer's duties include:

- Reviewing and approving the Site-Wide QAPP and site-specific work plans;
- Reviewing and approving substantive changes to the QAPP, SAP, and work plans;
- Reviewing any new work orders with the Project Manager to determine if the QAPP requires modification;
- Providing external review of field and analytical activities by performance of assessment and oversight duties as described in the QCP; and
- Conducting or delegating responsibility for field audits in conjunction with the corporate QA office and maintaining written records of those audits.

ARCADIS, Health and Safety Officer

Mr. Sam Moyers. The ARCADIS Health and Safety Manager reviews and internally approves the Health and Safety Plan (HSP) that will be designed to the specific needs and operations associated with this project. In consultation with the PM, the Health and Safety Manager will ensure that an adequate level of personal protection exists for anticipated potential hazards for field personnel. Identify the Field Health and Safety Officer (FHSO) for each field operation. On-site health and safety will be the responsibility of the FHSO. The FHSO will work in coordination with the PM and the

project Health and Safety Manager to ensure that all activities are conducted safely and in accordance with the HSPA as well as facility requirements.

ARCADIS, Project Chemist

Ms. Jane Kennedy. The Project Chemist is responsible for laboratory selection and oversight, data validation and verification, and hard copy and electronic analytical data oversight. The Project Chemist's specific duties include:

- Developing the Site-Wide QAPP and QA aspects of site-specific work plans;
- Providing external review of analytical activities by performance of assessment and oversight duties;
- Coordinating with the Project Manager, Task Managers, and laboratory management to ensure that QA objectives appropriate to the project are set and that laboratory and field personnel are aware of these objectives;
- Recommending, implementing, and/or reviewing corrective actions taken in the event of QA/QC failures in the laboratory or field;
- Reporting nonconformance with either QC criteria or QA objectives (including an assessment of the impact on data quality or work assignment objectives) to the appropriate managers; and
- Assisting with preparation of reports summarizing data quality.

Technical Staff

The technical staff for this program will be drawn from a pool of technical resources within ARCADIS. The technical staff will implement project and site tasks, analyze data, and prepare reports/support materials. All technical personnel assigned will be experienced professionals who possess the degree of specialization and technical competence required to perform the required work effectively and efficiently. All technical staff will be familiar with the HASP and all relevant Work Plans, standard operating procedures (SOPs), and policies applicable to the field work performed.

Laboratories

Independent laboratories providing analytical services will be chosen as appropriate for the various project requirements including routine monitoring, confirmation sampling,

remedial system monitoring, air analyses, and pilot/benchscale studies. Geotechnical laboratories may be selected based on project requirements and will be identified in the site-specific work plans. Selection criteria for geotechnical laboratories will be based on previous performance on ARCADIS projects or satisfactory recommendations. Analytical chemistry laboratories shall be accredited under the National Environmental Laboratory Accreditation Program (NELAP) and in accordance with Georgia requirements for the project analytical parameters for which accreditation is available through the primary accrediting state. The laboratory QA programs will be reviewed by the ARCADIS Project Chemist, as appropriate. The laboratory will assign an experienced Project Manager to coordinate analytical support for field operations with the ARCADIS Field Operations Manager and Project Chemist.

The analytical chemistry laboratories will provide services under a specified SOW and contractual agreement with ARCADIS. This QAPP incorporates by reference the laboratory, reporting and detection limits, and quality control limits. SOPs will be evaluated by the project chemist to ensure that method performance is acceptable. Appropriate data will be uploaded to the electronic project database for use by the ARCADIS Project Manager and task managers.

The laboratory staff will include a qualified QA Manager, who reports directly to laboratory management independently of the technical operations of the laboratory, to oversee technical adherence to the laboratory QA programs and this QAPP.

The specific duties of the laboratory Project Manager and QA Manager include:

- Reviewing the QAPP and other project requirements to verify that analytical operations will meet project requirements as defined in the project documents;
- Documenting and implementing project QA/QC requirements in the laboratory and reviewing analytical data (10 percent for the QA Manager) to verify that the requirements were met;
- Reviewing receipt of all sample shipments and notifying the Project Chemist of any discrepancies within 1 day of receipt;
- Conducting internal laboratory audits to assess implementation of the laboratory Quality Assurance Manual (QAM) and procedures and providing written records of those audits;
- Rapidly notifying the Project Chemist regarding laboratory nonconformance with the QAPP or analytical QA/QC problems affecting project samples; and

- Coordinating with the project and laboratory management to implement corrective actions as required by the QAPP and internal laboratory QAM.

The principal contract laboratory QAM will be incorporated in this QAPP by reference when the laboratory subcontract is executed. Microseeps Laboratories, Inc. (Microseeps), will provide analytical support for the monitored natural attenuation (MNA) dissolved gas and biogeochemical parameters, and Air Toxics, Ltd. (Air Toxics), will provide analysis of air samples as required. The QAMs for these laboratories shall be retained by the ARCADIS Project Chemist. Ozark Underground Laboratories will provide dye tracer analyses associated with remedial system performance assessments.

Other Subcontractors

Other subcontractors will provide services under the direct supervision or direction of the ARCADIS Project Manager or Task Managers or appropriate designated staff. The drilling, surveying, geotechnical laboratory, and other subcontractors are responsible for performance in accordance with the individual subcontracts and applicable portions of the QAPP and Quality Control Plan (QCP) as defined in each subcontract package. Subcontractors are responsible for rapidly notifying the Site Manager regarding nonconformance with the QAPP or QA/QC problems encountered or observed. Subcontractors must coordinate with the Site Managers to implement corrective actions.

1.2 Problem Definition/Background

Detailed project information is included in the PMP, the SAP, and the PBA contract or, if necessary, will be included in the appropriate work plans that define a particular SOW to be completed.

1.3 Project Description

The field sampling program and field procedures are described in detail in the SAP, and therefore are not repeated in this QAPP. Additional work plans will be prepared as sampling and analytical requirements are defined. Any additional specific QA requirements will be included in specific plans.

The purpose of this QAPP is to provide field, laboratory, and quality assessment personnel with general instructions regarding activities to be performed before, during, and after each sampling effort to ensure generation of usable data. This QAPP

contains general and specific details regarding field sampling, laboratory analytical methods, and data management that apply to the Site. The collection and documentation of data will be performed as described in the following sections to ensure the quality of the collected data.

1.4 Data Quality Objectives for Measurement Data

Table A-2 presents the overall project Data Quality Objectives (DQOs). Additional analytical performance and data review DQOs include precision, accuracy, representativeness, completeness, and comparability (PARCC). These criteria represent qualitative and quantitative objectives that ensure the data are generated that are scientifically valid and usable for the intended purpose. As discussed in *USEPA Guidance on Systematic Planning Using the Data Quality Objectives Process; USEPA QA/G-4*, dated February 2006 and *USEPA Requirements for Quality Assurance Project Plans; USEPA QA/G-5*, dated March 2001, the DQOs are dependent on the intended uses of the data and are based on the premise that the ultimate use(s) of a particular data set should dictate the quantity and quality of these data. These DQOs in conjunction with criteria set forth in this QAPP will be used as a guide for data quality assessment by establishing analytical protocols and documentation requirements that will allow the analytical data to be collected, analyzed, and verified/validated in a consistent manner.

1.4.1 Precision, Accuracy, Representativeness, Completeness, and Comparability

The basis for assessing the elements of data quality is discussed in the following subsections. The contract analytical laboratory precision and accuracy QC limits will be incorporated into the QAPP and updated as appropriate.

Precision measures the reproducibility of repetitive measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions.

Analytical precision is a measurement of the variability associated with duplicate (two) or replicate (more than two) analyses of the same sample in the laboratory and is determined by analysis of laboratory control samples/laboratory control sample duplicate (LCS/LCSD), matrix spikes/matrix spikes duplicate (MS/MSD), laboratory duplicates and field duplicates. If the recoveries of analytes in the LCS are comparable within established control limits, then laboratory precision is within limits. The contract laboratory control limits will be utilized to evaluate analytical precision.

Total precision is a measurement of the variability associated with the entire sampling and analysis process. It is determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations. Field duplicate samples and matrix duplicate spike samples are analyzed to assess field and analytical precision. Field duplicate samples will be collected at a minimum 5 percent frequency.

Duplicate results are assessed using the relative percent difference (RPD) between duplicate measurements. The formulas for the calculation of precision are provided in Table A-3 as RPD (used for two measurements), average RPD, relative standard deviation (RSD), and pooled RSD (used for more than two measurements). The proposed precision objective for soil and sediment field duplicates is an RPD of 70 percent and the precision objective for groundwater and surface water field duplicates is an RPD of 40 percent for all parameters analyzed.

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and systematic error. It reflects the total error associated with a measurement. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard. Analytical accuracy is measured by determining the percent recovery (%R) of known target analyses that are spiked into a LCS to a control limit. For organic parameters analyzed by GC and GC/MS surrogate compound recoveries are also used to assess accuracy and method performance for each sample analyzed.

Both accuracy and precision are calculated for preparation or analytical batches, and the associated sample results are interpreted by considering these specific measurements. The formula for the calculation of accuracy is included in Table A-3 as %R from pure and sample matrices. Laboratory precision and accuracy control limits will be incorporated by reference into this QAPP upon selection of the contract laboratory.

Representativeness is achieved through use of the standard field, sampling, and analytical procedures. Representativeness is also determined or influenced by appropriate program design, with consideration of proper sampling locations and collection techniques.

Completeness is calculated for the aggregation of data for each analyte measured for any particular sampling event or other defined set of samples. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. For completeness

requirements, valid results are all results not qualified with an "R" flag/reject or unusable data. For any instances of samples that could not be analyzed for any reason (e.g., holding time violations in which re-sampling and analysis were not possible, or samples spilled or broken), the numerator of this calculation becomes the number of valid results minus the number of possible results not reported.

The formula for calculation of completeness is presented, as follows:

$$\% \text{ completeness} = \frac{\text{number of valid results}}{\text{number of possible results}}$$

The completeness objective for sample matrices collected during these investigations will be at least 90 percent.

Comparability is the confidence with which one data set can be compared to another data set. The objective for this aspect of the QA/QC program is to produce data with the greatest possible degree of comparability. The number of matrices that are sampled and the range of field conditions encountered are considered in determining comparability. Comparability is achieved using standard methods for sampling and analysis, reporting data in standard units, and using standard and comprehensive reporting formats. Complete field documentation using standardized data collection forms shall support the assessment of comparability. Historical comparability is achieved through consistent use of methods throughout the project. EPA approved methods will be utilized for analytical chemistry determinations as available.

1.4.2 Objectives for Laboratory Analyses

The laboratory DQOs include method performance and reporting consistent with criteria presented in the USEPA document entitled "Test Methods for Evaluating Solid Waste-Physical/Chemical Methods," SW-846, Third Edition (as updated) the laboratory QAM and SOPs, this QAPP, and other applicable performance requirements published in EPA method guidance.

1.4.3 Objectives for Field Measurements

Field measurement DQOs for precision, accuracy, and completeness criteria presented in Table A-4 are consistent with the industry acceptance criteria.

Trip blanks (TBs) will accompany samples to be analyzed for volatile organic compounds (VOCs). Field duplicate samples will be collected at a frequency of 5 percent for each analysis and each sample matrix collected. Equipment blanks (EBs) and additional sample volume for MS analysis will be collected at a minimum five percent frequency for each analysis. Temperature blanks will be placed in each sample cooler and the temperature recorded upon laboratory receipt. Frequency for collection of field QC samples is presented in Table A-4.

The field sampling team will also be responsible for collecting additional sample quantities at a frequency of five percent for MS and MSD analyses.

1.5 Specialized Training and Certification

Training shall be provided to all project personnel to ensure compliance with the site specific Health and Safety Plan and technical competence in performing the work effort. Documentation of this training shall be maintained in the records of the contracted organizations. ARCADIS employees who participate in the types of activities defined in the Occupational Safety and Health Administration (OSHA) requirements under Code of Federal Regulations (CFR) 1910.120 complete the 40-hour health and safety training program. Each employee must successfully complete a minimum of 8 hours of refresher training annually to maintain the certification. Employee training records are maintained in the ARCADIS office where the employee resides. Any special requirements for personal possession of certification cards will be adhered to as program appropriate.

All analytical chemistry laboratories performing analyses will be required to maintain current NELAP accreditation for the parameters of interest if accreditation is available. Accreditation certificates, audit reports, and performance testing (PT) data will be reviewed by the Project Chemist, as appropriate to ensure that laboratory capabilities meet or exceed project requirements. Laboratories must also maintain internal training records for technical staff in accordance with standard laboratory practices and certification requirements. The laboratory will provide the applicable training records, including Initial Demonstration of Competence documentation, for review, as deemed necessary, by the ARCADIS Project Chemist.

All subcontractors and their employees will have current and applicable performance and certifications required to perform the assigned SOW. Subcontract agreements will include the specific training and certification requirements and applicable records will be reviewed as appropriate. Subcontractor training and certification documentation will be maintained at the subcontractors' offices.

1.6 Documents and Records

The primary documentation for the project includes field records, analytical data packages, and summary reports. This section describes the level of documentation and record keeping for the central project file that will be maintained by the ARCADIS office in Raleigh, North Carolina.

1.6.1 Document Control

All planning documents will be clearly identified by the document title, revision number, date, and page number in the header of each document page. Planning documents currently in use will be reviewed on an annual basis and any necessary revisions or updates will be amended and distributed to each participating party. Documents prepared in support of the PBA contract will be prepared and distributed as required.

Original field records and laboratory analytical data will be maintained in the ARCADIS Raleigh, NC office.

1.6.2 Field Documentation

Field documentation will include field logbook or daily logs, field sampling logs, instrument calibration logs, and data forms as necessary to provide sufficient information to allow review of field conditions, performance, and sample collection, to evaluate potential impacts to sample and data integrity, and to enable participants to reconstruct events that occurred during the field operations when necessary. Daily logs will also document any deviations from the SAP, QAPP, site or task specific work plans or other applicable planning documents and describe the rationale for the changes.

All entries will be made in waterproof ink, and the time of the entry will be recorded. The top of each page of the field documents will contain the date that the entries on that page were recorded. No pages will be removed from a bound logbook for any reason. Additional details on field documentation are provided in the SAP.

All documentation associated with field activities will be retained in the project file in accordance with the document retention policy stated in this QAPP and the QCP as applicable to the document type.

1.6.3.1 Corrections to Field Documentation

As with all bound data logbooks, no pages will be removed for any reason. If corrections are necessary on any field documentation, they will be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside it. The correction must be initialed and dated. As necessary, corrected errors will include a footnote explaining the correction.

1.6.3.2 Photographs

Photographs will be taken as directed by the Site Manager. Documentation by a photograph will ensure the validity as a visual representation of an existing situation. A log will be developed to track the media that the photos are filed on (e.g., compact disc, floppy disk). Photographs, as developed or transferred to electronic media, shall be compiled into a photograph log and information recorded in field notebooks added to the log with appropriate photographs.

1.6.3 Laboratory Data Reporting/Record Retention

Analytical data reports for all samples will be prepared by the laboratory as a Level II Data Package. The Level II Data Packages will include a fully-executed COC Record, sample receipt checklist, cross-reference table of field samples with laboratory sample number, preparation and analytical batch numbers, analytical results, collection and analysis dates and times, reporting limits (RLs), dilution factors, surrogate recoveries, method blank data. Summary QC data will be provided for LCS, MS accuracy and precision, laboratory replicate precision, laboratory control limits. The analytical report shall include the method detection limits (MDL), and the quantitative RLs. Appropriate data flags identifying any QC result reported outside control limits and an explanation of all data flags applied by the laboratory. The case narrative will present an explanation of all QC results reported outside control limits and samples analyzed at dilutions where all results are non-detect.

Where detailed data validation is required, analytical data reports will include the following items in addition to the elements of the Level II data package, sample aliquots, final extract volumes, run logs, quantitation reports, ion spectra, chromatograms, batch identification report clearly linking all QC results to field sample results, and instrument calibration and tuning information. The laboratory report will include copies of any nonconformance or corrective action forms associated with data generation. This level of analytical report components will be defined as a Level IV data package.

The RLs will be corrected for percent moisture (soils only) and all dilution factors. Any compounds found less than the RL, but greater than the MDL will be reported and qualified with a “J” flag as estimated. Soils will be reported on a dry weight basis.

The laboratory will provide an electronic data deliverable (EDD) that matches all data reported on the hard copy analytical report. Electronic data report requirements are described in Section 2.12.

The laboratory is required to retain all information associated with the analytical operations for samples associated with this project for a minimum of 6 years.

1.6.4 Electronic Data Retention

Electronic data and media retention policies will correlate with hard copy data retention at the laboratories as well as other points of electronic data generation. Additionally, electronic data will be subject to back-up routines that will enable recovery of data that may become corrupted or lost due to instrument, computer, and/or power failures. Electronic media will be stored in climate-controlled areas to minimize potential for degradation. Storage areas will be access limited.

2. Data Generation and Acquisition Elements

2.1 Sampling Process Design

The sampling process design will be presented in future work plans and in the SAP.

2.2 Sampling Methods

The field sampling procedures, sampling methods and equipment are also discussed in detail in the associated SAP. Calibration will be documented on a Field Equipment Calibration form, where each instrumented calibrated is identified along with the date, time, calibration reading, and field staff initials. The field sampling methods are referenced in the following section.

2.3 Sample Handling and Custody

Procedures to insure the custody and integrity of the samples begin at the time of sampling and continue through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal. Records concerning the custody and condition of the samples are maintained in field and laboratory records. All samples will be uniquely identified, labeled, and documented in the field at the time of collection and recorded on the Chain-of-Custody (COC) form. Samples collected for laboratory QC will be clearly identified on the COC (e.g. MSs). Details for completing the COC are included in Section 4.2.17 of the SAP. Field custody procedures are presented in Section 4.3 of the SAP.

Samples collected in the field will be transported to the laboratory or field testing site as expeditiously as possible. Samples requiring preservation at 4 degrees +/- 2 degrees Celsius (^{o}C) will be packed in ice or chemical refrigerant to keep them cool during collection and transportation. Any concerns and/or deviations will be reported to the contractor immediately.

Once the samples reach the laboratory, they will be checked against information on the COC form for anomalies. The condition, temperature, and appropriate preservation of the samples will be recorded by the laboratory on a sample receipt checklist, and will be made part of the permanent project custody records. The occurrence of any anomalies in the received samples and their resolution shall be documented in laboratory records. All sample information shall then be entered into the laboratory tracking and data management system. The laboratory PM shall review the log-in for accuracy and compliance with project requirements. Procedures ensuring internal

laboratory COC shall also be implemented and documented by the laboratory. Specific instructions concerning the analysis specified for each sample shall be communicated to the analysts. Analytical batches shall be created, and laboratory QC samples shall be introduced into each batch.

While in the laboratory, samples shall be stored in limited access, temperature controlled areas. Refrigerators, coolers and freezers used for sample storage will be monitored for temperature 7 days a week. Acceptance criteria for the temperatures of the refrigerators and coolers are 4°C to 2°C. Acceptance criteria for the temperatures of the freezers shall be less than 0°C. All of the cold storage areas shall be monitored by thermometers that have been calibrated with a NIST traceable thermometer. As indicated by the findings of the calibration, correction factors shall be applied to each thermometer. Records that include acceptance criteria shall be maintained. Samples shall be stored separately from standards. Samples shall be stored after analysis until disposed of in accordance with applicable local, state, and federal regulations. Disposal records shall be maintained by the laboratory. SOPs describing sample control, custody, and disposal shall be maintained by the laboratory.

2.4 Sample Containers

The volumes and containers required for the sampling activities are listed in Table A-5. The laboratory will provide new, pre-cleaned sample containers. The laboratory shall use an approved specialty container supplier that prepares the containers in accordance with USEPA bottle preparation procedures. TBs will be transported to the site inside the same cooler/box as the VOC vials.

Sample container lids will not be mixed. All sample lids must stay with the original containers as provided by the supplier. Bottle lids (with any associated bottle) exhibiting cracks, splits, or chips shall be appropriately discarded.

2.5 Sample Preservation and Holding Times

New and pre-preserved (as appropriate) containers obtained from the laboratory shall be used for all samples requiring preservation. Chemicals used by the laboratory for preservation will be reagent-grade chemicals. The laboratory shall maintain traceability records for all preservatives in the event of potential contamination of samples. The laboratory must ensure that preservatives used in containers supplied will not expire within the anticipated time of sample collection completion. Each bottle received from the laboratory must be clearly labeled with the type of chemical preservative in the bottle and the test parameters that will be determined from the sample collected in the

container. Sample containers will not be stored at the site for longer than 30 days. Bottle orders and any additional preservative requirements will be submitted to the laboratory 5 working days prior to commencement of field operations to allow supplies of clean, fresh containers and preservatives to be shipped to the facility.

Sample preservation will be verified on receipt at the laboratory with the exception of aqueous VOC samples. VOC sample preservation shall be verified prior to analysis. The preservation or pH check will be recorded on the sample receipt form or other appropriate logbook. If the samples are improperly preserved, a corrective action form will be submitted to the laboratory project manager for follow-up action. The laboratory will notify the ARCADIS Site Manager or Project Chemist to implement corrective actions in the field to ensure sufficient preservative is added at the time of sample collection.

Sample holding times will be based on published USEPA guidance and will be calculated for the date and time of collection. A list of preservatives and holding times for each type of analysis are presented in Table A-5. Additional preservation requirements and holding times for non-target analyses are listed in 40 CFR Part 136. Preservatives and holding times not listed in Table A-5 applicable to a specific task will be listed in the applicable SAP or work plan.

2.6 Analytical Methods

The primary analytical methods anticipated to be utilized for samples collected Table A-5. All methods will be USEPA approved/published. Additional USEPA approved methods, which may be utilized, are published in references listed below. Specific performance criteria, including QA protocols, for each analytical method, are documented in the published methods, laboratory SOPs, and the laboratory QAM. The QAM for each analytical laboratory performing work be reviewed as part of the procurement process and laboratory SOPs will be examined during onsite audits or as necessary. QAM is a generic term for the laboratory QA document, which describes the laboratory program to ensure data of known quality are generated. The contracted laboratory QAM will be incorporated by reference into this QAPP upon execution of the contract for analytical support.

2.6.1 Standard Laboratory Analytical Procedures

All standard analytical methods performed will be USEPA approved. The analytical methods are referenced in:

- *Test Methods for Evaluating Solid Waste, Physical Chemical Methods*, 3rd edition, SW-846, 1997.

- 40 CFR Part 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act*; and

- *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020, Revised March 1983.

The laboratory will perform all methods in accordance with the appropriate USEPA-approved methods and the laboratory specific SOPs for compliance with this QAPP and other project-specific requirements. The laboratory shall have method specific SOPs for all methods performed. The SOPs will detail method set-up, calibration, performance, and reporting criteria in accordance with SOP preparation under NELAP guidance and requirements. Method performance will be in strict compliance with the SOP and referenced method. Laboratory SOPs will include any modifications to the published method and will indicate actual performance protocols performed by the laboratory. The laboratory will update SOPs in accordance with NELAP requirements. The ARCADIS Project Chemist must approve any changes to the method performance acceptance criteria

The laboratory must notify the Project Chemist of any updated or revised RLs or performance control criteria prior to initiation of field operations. Required sample or extract dilutions to complete the analyses within method performance criteria may impact RLs. All required sample dilutions will be noted in the analytical report and explained in the case narrative. The laboratory shall make every effort to report all compounds/analytes at the lowest technically achievable limit to meet the risk screening standard requirements. The changes/elevations in limits will be evaluated to determine potential impact on DQOs. Any additional methods required for future projects will be specified in the SAP or Work Plan.

2.7 Elements of Quality Control

This section presents QC requirements relevant to analysis of environmental samples that shall be followed. The purpose of this QC program is to produce data of known quality that satisfy the project objectives and that meet or exceed the requirements of the standard methods of analysis. This program provides a mechanism for ongoing control and evaluation of data quality measurements through the use of QC materials.

Laboratory QC samples (e.g., blanks and LCSs) shall be included in the preparation batch with the field samples. Preparation batch is a number of samples (not to exceed 20 samples) similar in composition (matrix) and that are extracted or digested at the same time and with the same lot of reagents. MS and MSD samples do not count as environmental samples. The term analytical batch also extends to cover samples that do not need separate extraction or digestion (e.g., VOCs analysis by purge and trap). The identity of each preparation batch will be unambiguously reported with the analyses so that a reviewer can identify the QC samples and the associated environmental samples. The type of QC samples and the frequency of use of these samples are discussed in the following section. The laboratory will provide spike results from site-specific field samples of groundwater and soil, not from another client or site. Additional QC samples may be added to those required by the method to ensure accurate and precise data. The frequency of analysis of laboratory QC samples is presented in Table A-6.

2.7.1 Laboratory Control Samples

The LCS is analyte free water (aqueous samples) or clean sand (soil/sediment matrix) spiked with known concentrations of specific analytes. The LCS shall be carried through the complete sample preparation and analysis procedure. The LCS is used to evaluate each preparation batch and to determine if the method is in statistical control. One LCS will be included with every analytical batch. All target analytes will be spiked in the LCS.

In accordance with method criteria and laboratory SOPs, an LCS analyte outside the recovery acceptance limit mandates corrective action unless the out of control scenario does not impact data usability. Where corrective action is required and after the system problems have been resolved with system control re-established, all samples in the analytical batch will be reanalyzed for the out of control analyte(s). When an analyte in an LCS exceeds the upper or lower control limit and no corrective action is performed, the appropriate validation flag, as described in the data validation section, will be applied to all affected results. LCS results will be compared to the laboratory LCS control limits.

2.7.2 Matrix Spike and Matrix Spike Duplicate

An MS is an aliquot of sample spiked with known concentrations of specific compounds. The spiking occurs prior to sample preparation and analysis. The laboratory will provide the results at a minimum of one MS and one MSD sample for every 20 environmental samples. The MS and MSD samples will be designated on the

chain of custody (COC) form. Additional sample quantities will be collected so that MS and MSD analyses can be performed on the environmental samples collected at the Site. The full list of target analytes will be spiked into the samples utilized for the MS and MSD.

An MS is used to document the bias of a method in a given sample matrix. MS and MSD results are used to evaluate the matrix effect, not to control the analytical process. The recoveries of analytes in the MS/MSD will be compared to the laboratory QC acceptance limits 2. If the recoveries for the MS or the MSD are outside the QC acceptance limits, sample data will be evaluated by the Project Chemist to determine extent of impact.

2.7.3 Surrogates

Surrogates are organic compounds that are similar to the target analyte(s) in chemical composition and behavior in the analytical process, but that are not normally found in environmental samples. Surrogates are used to evaluate accuracy, method performance, and extraction efficiency. Surrogates are added to samples, controls, and blanks, in accordance with the method requirements.

When the recovery of a surrogate is outside the acceptance limits, corrective action steps must be taken. After the system problems have been resolved and system control has been re-established, the sample is re-prepared and re-analyzed. Re-preparation and re-analysis is not required if the laboratory is able to provide objective evidence with the case narrative of the final report documenting matrix interference (that is, unresolved co-eluting peaks on reconstructed ion chromatograms, or observations about visibly oily samples). If corrective actions are not performed or are ineffective, the appropriate validation flags are applied to the sample results. Re-extractions will be done within the holding times. Laboratory surrogate recovery limits will be included in each analytical report.

2.7.4 Internal Standards

Internal Standards (ISs) are measured amounts of certain compounds added after preparation or extraction of a sample. They are used in an IS calibration method to correct sample results affected by column injection losses, purging losses, or viscosity effects. ISs are added to samples, controls, and blanks, in accordance with the method requirements.

When the IS results are outside of the acceptance limits, corrective actions shall be performed. After the system problems have been resolved and system control has been re-established, samples analyzed while the system was malfunctioning are re-analyzed. If corrective actions are not performed, the appropriate validation flag, as described in the data validation section of this QAPP.

2.7.5 Retention Windows

Retention time windows are used in GC analysis for qualitative identification of analytes. They are calculated from replicate analyses of a standard on multiple days. The procedure and calculation method are given in SW-846 Method 8000A.

When the retention time is outside of the acceptance limits, corrective actions will be performed. After the system problems have been resolved and system control has been re-established, samples analyzed since the last acceptable retention time check are re-analyzed. If corrective actions are not performed, the appropriate validation flag, as described in the validation section, will be applied to the sample results.

2.7.6 Method Blank

A method blank is an analyte free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank will be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process. A method blank will be included in every analytical batch and representative for each sample matrix.

The presence of analytes in a method blank at concentrations greater than the MDL or RL for common laboratory contaminants indicates a need for corrective action. Corrective actions will be performed to eliminate the source of contamination prior to proceeding with analysis. After the source of contamination has been eliminated, all samples in the analytical batch will be re-prepared and re-analyzed. No analytical data will be corrected for the presence of analytes in blanks. When an analyte is detected in the method blank, but not in the associated samples, no corrective action is necessary. When an analyte is detected in the blank and in the associated samples and corrective actions are not performed, the appropriate validation flag, as described in the data validation section, will be applied to the sample results.

2.7.7 Equipment Blank

An EB is a sample of organic free water (for VOCs analyses) poured into, or over, or pumped through the sampling device, collected in the sample bottle, and transported to the laboratory for analysis. EBs are used to assess the effectiveness of equipment decontamination procedures.

EBs are collected immediately after the equipment has been decontaminated. The frequency requirements for collecting EBs are a minimum of five percent of the environmental samples. The blank shall be analyzed for all laboratory analyses requested for the environmental samples collected at the Site. When an analyte is detected in the EB the appropriate validation flag, as described in the data validation section, shall be applied to all sample results from samples collected. It should be noted that the laboratory will supply the organic free water. A sample aliquot of the organic free water will be submitted for the analysis of all parameters of interest.

2.7.8 Trip Blank

The TB consists of a VOC sample vial filled in the laboratory with ASTM Type II reagent grade water, transported to the sampling site, handled like an environmental sample and returned to the laboratory for analysis. TBs are not opened in the field. TBs are prepared only when VOC samples are taken and are analyzed only for VOC analytes. TBs are used to assess the potential introduction of contaminants from sample containers or during the transportation and storage procedures.

When an analyte is detected in the TB the appropriate validation flag as described in the validation section, shall be applied to all sample results from samples in the cooler with the affected TB. One TB of either soil or liquid matrix shall accompany each cooler of samples submitted to the laboratory for VOC analysis.

2.7.9 Field Duplicates

A field duplicate sample is a second sample collected at the same location as the original sample. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. The sample containers are assigned an identification number in the field such that they cannot be identified (blind duplicate) as duplicate samples by laboratory personnel performing the analysis. Specific locations are designated for collection of field duplicate samples prior to the beginning of sample collection.

Field duplicate sample results are used to assess precision, including variability associated with both the laboratory analysis and the sample collection process. Field duplicates will be collected at a frequency of 5 percent of samples collected. Analytical results for field duplicate will be assessed during the data validation process. Specific locations will be designated for collection of field duplicate samples prior to the beginning of sample collection. Control limits for evaluation of precision for field duplicates will be 40 percent for aqueous samples and 70 percent for soil/sediment samples.

2.8 Instrument/Equipment Testing, Inspection, and Maintenance

Field equipment testing (calibration) and inspection will be completed daily and documented on the daily calibration form. Field equipment maintenance will be completed on an as needed basis.

Maintenance responsibilities for laboratory instruments are assumed by the respective Laboratory Facility Manager. The managers then establish maintenance procedures and schedules for each major equipment item. This responsibility may be delegated to field or laboratory personnel, although the managers retain responsibility for ensuring adherence to the prescribed protocols. All field instrument/equipment will be inspected prior to the project initiation.

2.8.1 Maintenance Schedules

The effectiveness of any maintenance program depends to a large extent on adherence to specific maintenance schedules for each major equipment item. Other maintenance activities are conducted as needed. Manufacturers' recommendations provide the primary basis for the established maintenance schedules, and manufacturers' service contracts provide the primary maintenance for many major instruments.

2.8.2 Spare Parts

Along with a schedule for maintenance activities, an adequate inventory of spare parts is required to minimize equipment downtime. The inventory includes those parts (and supplies) that are subject to frequent failure, have limited useful lifetimes, or cannot be obtained in a timely manner should failure occur.

Field sampling task leaders and the respective laboratory managers are responsible for maintaining an adequate inventory of spare parts. In addition to spare parts and

supply inventories, the contractor shall maintain an in house source of backup equipment and instrumentation.

2.9 Instrument/Equipment Calibration and Frequency

Field equipment will be calibrated at the frequency recommended by the manufacturer's specifications and/or described by the analytical method.

Analytical instruments will be calibrated in accordance with the procedure specified in the analytical methods. All analytes that are reported shall be present in the initial and continuing calibrations, and these calibrations must meet the acceptance criteria specified in the analytical method. Records of standard preparation and instrument calibration will be maintained by the laboratory. Records shall unambiguously trace the preparation of standards and their use in calibration and quantitation of sample results. Instrument calibration will be checked using all of the analytes. All calibration criteria will satisfy SW-846 requirements at a minimum. The initial calibration will be checked at the frequency specified in the methods using materials prepared independently of the calibration standards.

2.10 Inspection/Acceptance of Supplies and Consumables

The laboratory will inspect supplies and consumables prior to their use in analysis. The materials description in the methods of analysis shall be used as a guideline for establishing the acceptance criteria for these materials. Introduction of interfering compounds into the analytical process will be monitored by analysis of method blanks. Purity and efficiency of reagents shall be monitored by analysis of LCSs. An inventory and storage system for these materials will assure use before manufacturers' expiration dates and storage under safe and chemically compatible conditions.

Sample containers will be laboratory supplied. All containers will be certified clean and the certificates will be retained by the laboratory. Containers are stored in clean areas to prevent exposure to fuels, solvents, and other contaminants.

2.11 Non-Direct Measurements

Non-direct measurement data will be entered into the project file. Data will be entered from forms, tables and data packages as presented in the documents/reports. All data entry will be peer reviewed prior to finalization.

2.12 Data Management

The data reduction, review, reporting, and validation procedures described in this section will ensure that (1) complete documentation is maintained, (2) transcription and data reduction errors are minimized, (3) the data are reviewed and documented, and (4) the reported results are qualified, as necessary. Laboratory data reduction and verification procedures are required to ensure that the overall objectives of analysis and reporting meet method and project specifications.

2.12.1 Electronic Data Management

Data management protocols track samples and results from work plan implementation to the final report. The field data include approved work planning tables, labels, field sampling forms, COC, and logbooks. Geographic coordinates will be generated for all sample locations in electronic format. The Field Operations Leader or designee will review all field data for accuracy. Field data will be collected using portable data acquisition (PDA) devices or manually entered into a database or spreadsheet.

The laboratory will provide an EDD for all analytical reports. The EDD will be in the format required for the project environmental database and include, at a minimum, the following information:

- Laboratory information – Laboratory name, client name, laboratory work order, client project number, and date received;
- Sample information – Laboratory project number, sample identification, laboratory sample identification, date sampled, time sampled, matrix;
- Analytical Data – Sample Delivery Group (SDG), test code, test name, analyte, analyte type, sample type, CAS number, date and time prepared, date and time analyzed, preparation batch identification, analytical batch identification, result, laboratory qualifier, MDL, RL, and dilution factor; and
- QC Data – All fields provided for analytical data will also be populated for method blanks, surrogates for all samples, LCS, MS/MSD, and laboratory replicates. QC sample data will also include QC Sample Type, recoveries, RPDs, control limits, and any associated qualifiers. Calibration data are not required.

The Project Chemist, Data Manager, or designee will review approximately 5 percent of electronic laboratory and field data to verify the results against the hard copy and check for transcription errors. A greater than 15 percent discrepancy rate in two consecutive datasets will require additional review and verification. Electronic data will match the hard copy data for all results. Significant figures and rounding routines may differ slightly based on the program utilized to generate hard copy reports and electronic files, but may not differ to the point of impacting data integrity or usability. The results will be transferred to a centralized database. The ARCADIS Data Manager or data validator will add any data qualifiers. The Data Manager will generate data tables for the project team as required. The Project Chemist and Site Manager will resolve discrepancies between the planned activities and actual data collected and document the findings in the data report. The central database will be stored in a secure area with access limited to data management specialists designated by the Project Manager. The central database will be electronically linked to a geographic information system/computer-aided design (GIS/CAD) systems, risk assessment programs, and other final data user models and statistical programs. Data users may enter additional electronic data such as risk-based criteria for comparison of the results. This data will be stored in separate tables in the database and linked to the actual results. Any data from outside sources will include a description of the data, a reference to the source, and the date updated. The outside data will be checked prior to use in order to verify that the most current values are used.

2.12.2 Field Data Review

All field data and the required forms will be reviewed by the author prior to submittal to the Site Manager or designee for review. Any field forms or documentation requiring amendments and/or corrections will be clearly documented on the corresponding day's field form or logs and initialed. Corrections will be made by a single line, followed by initials. The Site Manager or designee will verify the field review then submit the documents for data entry and/or retention in the project file.

2.12.3 Laboratory Data Review

The analytical laboratory will perform a series of internal reviews/audits prior to submittal of the final data package.

2.12.3.1 Laboratory Internal Review

In each laboratory analytical section, the analyst performing the tests shall review 100 percent of the data. After the analyst's review has been completed, 100 percent of the data shall be reviewed independently by a senior analyst or by the supervisor of the respective analytical section using the same criteria.

Data qualifiers shall be added by the laboratory supervisor of the respective analytical section, after the first and second level of laboratory data reviews have been performed. Analytical batch comments shall be added to the first page/Case Narrative of the data report packages to explain any non-conformance or other issues. When data are qualified, the laboratory supervisor shall apply a final qualifier to any data that have been affected by multiple qualifiers. This final qualifier shall reflect the most severe qualifier that was applied to the data, that is, all data will have only one data qualifying flag associate with it.

The laboratory QA section shall review 10 percent of the completed data packages, and the laboratory project manager shall perform a sanity check review on all the completed data packages. The laboratory shall apply appropriate data qualifying flags to any impacted field sample including field QC samples.

The laboratory will submit the analytical data package and EDD to ARCADIS via email and on compact disk. The analytical report will be complete and signed and submitted in portable document format (pdf). The EDD shall be prepared in accordance with the protocols defined by ARCADIS for input into the electronic data management system.

2.12.3.2 Analytical Report and Data Management

Upon submittal of the data package (report and EDD), the data will be logged in by the data manager as received and the EDD loaded into the project database. The Data Manager will forward the analytical data to the Project Chemist or designee for review and validation in accordance with Section 3 of this QAPP. The data package, at a minimum, will be reviewed to assure completeness and that the EDD matches the report. Once the analytical data package is determined to be final and complete and as validated, the data with any applicable data qualifiers will be added to the project database. Any data validation reports will be submitted to the Data Manager archiving with the analytical report. The data will then be available for distribution to the project team. Upon completion, the analytical data package, EDD, and validation report will be submitted to the project file.

2.12.4 Archiving

The laboratory shall maintain electronic and hardcopy records sufficient to re-create each analytical event conducted for a minimum of 6 years. Data will be accessible within 7 working days upon request. ARCADIS will retain the project files for at least 6 years.

3. Assessment and Oversight

3.1 Assessment and Response Actions

Assessment activities include management and assessments, technical systems audits, and performance evaluations. Management assessments include routinely scheduled meetings and conference calls to evaluate staff utilization. Assignment of qualified personnel to projects, maintenance of schedules and budgets, and quality of project deliverables are verified as part of these assessments. Performance evaluations are used to ensure that trained and qualified staff is utilized for the project. Technical assessment activities include peer review, data quality reviews, and technical system audits (i.e., laboratory and field). Technical systems audits include review and evaluation of field and laboratory performance to assess the implementation of quality programs and directives specifically for the project. Procedures for assessment and audit of data quality are described in Section 4 of this QAPP. Procedures for peer review and technical assessments are summarized briefly below. Both the overall and direct technical assessment activities may result in the need for corrective action. The procedure for corrective action response is summarized below.

3.1.1 Peer Review

All project deliverables including work plans, SAPs, draft and final reports, and technical memoranda will be peer reviewed by ARCADIS. The peer review process provides for a critical evaluation of the deliverable by an individual or team to determine whether the deliverable will meet the established criteria, DQOs, technical standards, and contractual obligations. The PM or APM will assign peer reviewers, depending on the nature and complexity of the project, when the publication schedule is established. The PM will be responsible for ensuring all peer reviewers participate in the review process and approve all final deliverables. The QA Manager is responsible for verifying that project documents were generated in accordance with the project requirements.

3.2 Corrective Action

Corrective actions will be implemented as necessary to insure that project activities are performed and data are generated in accordance with the project quality documents. In conjunction with the QA Manager and Project Chemist, the Project Manager and Site Managers are responsible for initiating and implementing corrective action in the field and in the office. The laboratory project manager, in conjunction with the laboratory technical staff and QA manager, is responsible for implementing corrective action in

the laboratory. It is the combined responsibility to insure that all analytical procedures are followed as specified and that the data generated meet the prescribed acceptance criteria. Specific corrective actions necessary will be clearly documented in the logbooks or analytical reports.

In all cases in which corrective actions of field procedures are required, a written report describing the nature of the problem, an evaluation of the cause, if known, and the action taken will be prepared by the ARCADIS Site Manager or the ARCADIS QAO. The report will be distributed to the ARCADIS PM, the ARCADIS QAO (if not preparing the report), and the ARCADIS Project Director.

Any corrective actions taken by the contract laboratory will be reported to the ARCADIS Project Chemist. The laboratory will include in each data package a discussion of the problems encountered and corrective actions taken. In addition, the laboratory will maintain a file that documents all corrective actions taken. Reports of corrective actions undertaken during laboratory analysis will be documented, as appropriate, in the Data Validation Report.

3.3 Performance and Data Quality Reports

Data Validation Reports - Data validation reports will be completed by the Project Chemist as soon as possible after receipt of the data from the laboratory (i.e., the goal is within 3 weeks). Impacts on the usability of the data will be tracked by adding qualifiers to individual data points as described in Section 4.

Serious analytical problems will be reported immediately to the ARCADIS Project Chemist by the laboratory PM. The ARCADIS Project Chemist will notify the ARCADIS Site Manager and PM to evaluate necessity for resampling or additional sample collection. Time and type of corrective action (if needed) will depend on the severity of the problem and will be related to overall project importance of the data points. Corrective actions may include altering procedures in the field, conducting an audit, resampling or modifying laboratory protocol.

Project Status Reports - Project status reports are completed by the PM to document the overall assessment of the project on a monthly basis. The Project Status Report tracks the overall quality of performance relative schedule, budgets and other issues.

4. Data Validation and Usability

The general procedures for data validation and usability are described below. These procedures will be adapted, if necessary, to meet project-specific or activity-specific requirements. Data validation and usability criteria set forth in this QAPP shall be followed unless otherwise amended in the SAPs or Work Plans which will address any modifications to data review criteria not included in this QAPP.

4.1 Data Review, Verification, and Validation

Data generated will be reviewed for conformance with the QAPP, SAP and other applicable work plans, as well as specific project requirements. QA information provided by the laboratory will be evaluated relative to the methods performed, the laboratory SOPs, the laboratory QAM, COC requests, Laboratory Task Orders (LTOs) or similar directive document, and this QAPP, as appropriate. The laboratory will be responsible for internal review of all calibrations, raw data, and calculations. The final analytical report will be reviewed by the laboratory PM and other appropriate laboratory management personnel for compliance with the above listed documents including peer and supervisory review prior to releasing data to ARCADIS.

The ARCADIS Project Chemist and data validation team will perform additional verification and validation of laboratory data to assess the quality and usability of the data generated. Field record review will include instrument calibration logs, sampling logs, COC records, field notes, and field parameter results. The field information assessment will evaluate the potential for impact to sample integrity and chemical data quality.

Chemical analytical data collected will be reviewed and, as appropriate, qualified using guidelines established in the USEPA National Functional Guidelines (NFGs) modified to incorporate method and project-specific requirements. The analytical data review will be performed under either of two levels: Tier 2 or Tier 3. The frequency and components included in each tier are defined in Sections 4.2.2.1 and 4.2.2.2.

4.2 Verification and Validation Methods

The data review scheme for analytical results from the receipt of the analytical data through the validated report is described below. The laboratory is responsible for performing internal data review. The data review by the analytical laboratory will include 100 percent analyst review, 100 percent peer review, and 100 percent review by the laboratory project manager to verify that all project-specific requirements are

met. The laboratory QA Officer will perform a review on 10 percent of the data packages. All levels of laboratory review will be fully documented and available for review if requested or if a laboratory audit is performed.

After receipt from the laboratory, project data will be verified and validated by ARCADIS or experienced contract personnel using the following steps.

4.2.1 Evaluation of Completeness

The Project Chemistry Team will verify the following report content for all data, as appropriate, for the required level of data validation:

- Laboratory information matches the field information;
- Fully executed COC records;
- Report completeness and conformance with COC, LTO, QAPP, Site-Specific Work Plan, and other project requirements;
- Case narrative describing any out-of-control events and summarizing analytical observation or non-conformances;
- Sample receipt information;
- Data report forms;
- QA/QC summary data;
- Initial and continuing calibration information (Tier 3 validation);
- Instrument tuning data (Tier 3 validation);
- Quantitation reports (Tier 3 validation);
- Batch and/or run logs (Tier 3 validation);
- Chromatograms (Tier 3 validation); and
- Documentation of any QC problems.

If the data package is incomplete, the Project Chemist will contact the laboratory, which must provide all missing information within a reasonable timeframe (i.e., 1 to 2 days).

4.2.2 Evaluation of Compliance

The data validation procedures are briefly outlined below:

- Electronic checking routines (Tier I validation) will be utilized to check 100 percent of the field and laboratory QC data (LCS, MS/MSD, blanks) to verify that holding times and acceptance and performance criteria were met and to note any anomalous values. Appropriate data qualifiers (Section 4.3) will be applied to the data where deficiencies are identified;

- All chemistry data generated with the exception of waste characterization, storm water discharge, and remedial system operational monitoring will undergo a Tier 2 validation. Initially, one SDG for each matrix will undergo the detailed Tier 3 validation to ensure laboratory performance;

- All data will be checked to ensure all analytical problems and corrections are reported in the case narrative and that appropriate laboratory qualifiers are added; and

- For any problems identified, review concerns with the laboratory, obtain additional information if necessary, and check all related data to determine the extent of the error. Data qualifiers will be applied to the analytical results to indicate potential limitations on data usability.

The data validation team will follow qualification guidelines in USEPA *Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review*, EPA 540/R-99/008, October 1999; USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-01/008, July 2002; USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-04/004, October 2004; Laboratory QAM; Laboratory Methods; and the QAPP with performance criteria based on the published analytical methods and laboratory established control limits.

4.2.2.1 Tier 2 Verification

Tier 2 data verification includes a review of all sample documentation coupled with electronic data screening and manual review. The analytical report will be assessed for completeness and for compliance with COC requests, LTO, SAP, and any additional work plan documents. The electronic data compliance will be conducted utilizing the EQuIS Data Qualification Module (DQM), a module within the Earthsoft suite of environmental data management products. All analytical data will be managed within

the EQuIS Chemistry database via electronic uploading of laboratory data. The DQM is written in Visual Basic for the EQuIS database and checks for the following parameters:

- Blank contamination;
- MS and MSD recoveries;
- MS/MSD RPD;
- LCS and LCSD recoveries;
- LCS/LCSD RPDs (when available);
- Surrogate recoveries;
- Field duplicate RPDs; and
- Holding times.

The DQM routines apply appropriate qualifiers to the data. Select manual reviews will verify appropriate qualifier application. Data Qualifiers will not be manually applied to original hard copy analytical reports. The validation reports will be included with any submittal of analytical reports to agencies or other required party

4.2.2.2 Tier 3 Validation

One SDG for each matrix collected during the initial phases of the project will undergo a detail data validation which will include the complete Tier 2 assessment and review of the additional following information relative to target compounds/analytes:

- Instrument tune;
- Initial calibration;
- Continuing calibration;
- Interference check standards (metals only);
- Serial dilutions (metals only);
- Quantitation reports;

- Internal standard area (organics only);
- Retention times (as applicable by method);
- Chromatograms (as applicable by method);
- Ion spectra for compound identification;
- Data transcription from instrument report to hard copy report; and
- A subset of calculations will be verified for each sample.

4.2.3 Data Validation Reporting

The Project Chemist will perform the following reporting functions:

- Alert the QA Manager and the Site Manager to any QC problems, obvious anomalous values, or discrepancies between the field and laboratory data and resolve any issues;
- Discuss QC problems in a data validation memo for each laboratory report;
- Review the laboratory EDD and electronic field data, enter the data qualifiers into the database, and oversee preparation of analytical data summary tables. The tables will summarize those samples and analytes for which detectable concentrations were exhibited as well as complete analytical summary tables. The tables will include field QC samples; and
- Prepare a summary of the quality control information at the completion of all field and laboratory efforts for the site. The report will summarize planned versus actual field and laboratory activities and data usability concerns.

The Project or Task Manager provides the final Data Quality Assessment during the technical review of the data report.

4.2.4 Validation Reports

Reports will be generated for each data package or combination of data packages for a single sampling event to record the results of the validation effort. The reports will identify all deficiencies and the impact on the results. The data validator or the Database Manager will append qualifiers generated during the verification/validation

process to the EQuIS database and a summary table of the data qualifiers will be included with the analytical report.

4.3 Reconciliation with Data Usability Requirements

For routine assessments of data quality, ARCADIS will implement the data verification/validation procedures described in Section 4.2 and assign appropriate data qualifiers to indicate limitations on the data. The Project Chemist will be responsible for evaluating precision, accuracy, representativeness, comparability, and completeness of the data using procedures described in Section 1.4. Any deviations from the analytical DQOs for the project will be documented in the data verification/validation memo and provided to the data users for the project. The Project Chemist will work with the final users of the data in performing data quality assessments. The data quality assessment may include some or all the following steps:

- Data that are determined to be incomplete or not usable for the project will be discussed with the project team. If critical data points are involved which impact the ability to complete the project objectives, the data users will report immediately to the Site Manager. The Site Manager will discuss the resolution of the issue with the ARCADIS Project Manager and implement the necessary corrective actions (for example, resampling);

- Data that are non-detect but have RLs elevated due to blank contamination or matrix interference will be compared to screening values (see Appendices B and C). If RLs exceed the screening values, then the results will be handled as appropriate for data use; and

- Data qualified as estimated will be utilized if it is determined that the data are useable for their intended purpose. If an estimated result is close to a screening value, then there is uncertainty in any conclusions as to whether the result exceeds the screening value. The data user must evaluate the potential uncertainty in developing recommendations for the site. If estimated results become critical data points in making final decisions on the site, the Site Manager should evaluate the use of the results and may consider the data point incomplete.

In the validation process there are two types of data validation codes that may be applied, those related to identification (confidence concerning the presence or absence of compounds) and those related to quantitation. Each of the standard data validation codes is defined below:

R	Data point is unusable due to serious deficiencies in analytical and QC criteria. The presence or absence of the analyte/compound cannot be verified
UB	Not detected substantially above the level reported in laboratory or field blanks. For organics - 5X (10X for common lab contaminants) or for metals - 10X. Data point considered non-detect at the value qualified.
U	Analyte/Compound not detected. The associated value indicates the concentration above which the result would be considered a quantitative value.
J	Reported value is considered an approximate concentration.
UJ	Analyte/compound not detected above the quantitation limit. However, the reported quantitation limit is approximate.

The ultimate data assessment process involves comparing analytical results to screening values and background concentrations to determine whether the contamination present is site related (i.e., above background levels) or significant (i.e., above screening values). Additional data assessment may be performed on site-by-site basis. Any additional procedures for data quality assessment will be provided in the OU-Specific Work Plan.

5. References

40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act.

ARCADIS. 2009. Project Management Plan, ARCADIS, February.

USEPA. 1983. Methods for Chemical Analysis of Water and Wastes, Environmental Monitoring and Support Laboratory, Cincinnati, OH, EPA-600/4-79-020, March.

USEPA. 1997. Test Methods for Evaluation Solid Waste: Physical/Chemical Methods, Update IIIA. SW-846, Office of Solid Waste and Emergency Response, Washington, DC.

USEPA. 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. Office of Emergency and Remedial Response, EPA540/R-99/008 (OSWER 9240.1-05A-P), October.

USEPA. 2001. Requirements for Quality Assurance Project Plans for Environmental Data Operations, EPA QA/R-5, Office of Environmental Information, EPA/240/B-01/003, March.

USEPA. 2002. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, Office of Emergency and Remedial Response, EPA 540-R-01-008 (OSWER 9240.1-35), July.

USEPA. 2002. Guidance for Quality Assurance Project Plans, EPA QA/G-5,Office of Environmental Information, EPA/240/R-02/009, December.

USEPA. 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, Office of Superfund Remediation and Technology Innovation, EPA 540-R-04-004 (OSWER 9240.1-45), October.

USEPA. 2006. Guidance on Systematic Planning and Using the Data Quality Objectives Process; EPA /240/B-06 QA/G-4.

ARCADIS

Tables

Table 1: ARCADIS Technical Team Contact Information

Name and Contact Information	Telephone/E-Mail	Project Function
Chuck Bertz, P.E. ARCADIS U.S., Inc. 801 Corporate Center Dr., Suite 300 Raleigh, NC 26707	Phone: 919-854-1282 ext. 187 Cell: 919-607-3498 chuck.bertz@arcadis-us.com	ARCADIS Project Manager
Shelley Gibbons ARCADIS U.S., Inc. 30 Patewood Dr. ,Suite 155 Greenville, SC 29615	Phone: 864-987-3914 Cell: 864-704-3752 shelley.gibbons@arcadis-us.com	ARCADIS Associate Project Manager
Kurt Beil ARCADIS U.S., Inc. 6 Terry Drive Suite 300 Newtown, PA 18940	Phone: 267-685-1800 Cell: 215-680-2310 kurt.beil@arcadis-us.com	ARCADIS QA Manager
Scott Bostian, P.E. ARCADIS U.S., Inc. 801 Corporate Center Dr., Suite 300 Raleigh, NC 26707	Phone: 919-854-1282 Cell: 919-417-2643 curtis.bostian@arcadis-us.com	ARCADIS Site Manager
Andrew Davis ARCADIS U.S., inc. 30 Patewood Dr. ,Suite 155 Greenville, SC 29615	Phone: 864-987-3917 Cell: 864-561-5833 andrew.davis@arcadis-us.com	ARCADIS Site Manager
Jane Kennedy ARCADIS U.S., Inc. 3850 N. Causeway Blvd. Metairie, LA 70002	Phone: 504-832-4174 ext 106 Cell: 225-205-8256 jane.kennedy@arcadis-us.com	ARCADIS Project Chemist
Sam Moyers ARCADIS U.S., Inc. 114 Lovell Rd., Suite 202 Knoxville, TN	Phone: 865-675-6700 Cell: 865-621-2117 sam.moyers@arcadis-us.com	ARCADIS Health and Safety Manager
Janet Christy ARCADIS U.S., Inc. 6 Terry Drive, Suite 300 Newtown, PA 18940	Phone: 864-906-5001 Cell: 864-906-5001 janet.christy @arcadis-us.com	ARCADIS Database Manager

Table A-2. Data Quality Objectives for Site Characterization.

Data Quality Objective	Project Specific Action
Problem statement	Historical activities have contributed to environmental impacts to surface and subsurface soil, surface water and groundwater at the military facilities. The project goals include delineation of environmental impacts and achieving remedy in place or response complete in accordance with the timeline set forth in the performance based contract. To achieve these goals, characterization activities shall be performed in accordance with the sampling and analysis plans, implementation of remedial actions, monitoring of remedial performance, and confirmation of attainment of clean-up goals.
Identify the decisions	• Do constituent concentrations exceed the screening criteria? • Has the Site been delineated? • What remedial system will be used to reduce constituent concentrations? • Does the remedial system meet the performance goals?
Identify the inputs to the decision	• Complete additional delineation sampling and compare identified CoC data to screening levels; and define extent of contamination. • Design and implement remedial systems • Monitor remedial system performance • Confirm reduction in contaminant levels to below clean-up goals.
Develop the decision rule	• If soil and groundwater quality data indicate concentrations above screening levels, the affected media will be addressed by additional site investigation to delineate the nature and extent of impact to the affected media. • When the Site is delineated, the soil and groundwater quality data will be evaluated to determine if an active remediation is required to reduce the concentrations below the clean-up goals. • If the remedial system does not meet the performance goals, modifications to the existing system and/or an additional or alternative remedial system will be implemented.
Specify limits on decision errors	Data quality and usability will be determined in accordance with the criteria set forth in the QAPP. Rejected data will not be used for decision-making purposes.

CoC Constituent of Concern.
QAPP Quality Assurance Project Plan.

Table A-3 Statistical Calculations

Statistical	Symbol	Formula	Definition	Uses
Mean	X	$\frac{\left(\sum_{i=1}^{\eta} x_i\right)}{n}$	Measure of central tendency	
Standard Deviation	S	$S_x = \left(\frac{n\Sigma\chi 2 - (\Sigma\chi)^2}{n(n-1)}\right)^{1/2}$	Measure of relative scatter of the data	
Relative Standard Deviation		$(S / \overline{X}) \times 100$	Relative standard deviation, adjusts for magnitude of observations	Used to assess precision for replicate results
Pooled RSD	RSD_p	$\left(\frac{\sum_{i=1}^{\eta} (RSDi)^2 \, df\, i}{\sum_{i=1}^{\eta} dfi}\right)^{1/2}$	Measure of overall variability of a series	Used to assess overall performance for compounds with multiple measurements
Relative Percent Difference	RPD	$\left(\frac{(X_1 - X_2)}{(X_1 + X_2)/2}\right) \times 100$	Measure of variability that adjusts for the magnitude of observations	Used when there are only two observations; mathematically related to RSD

Table A-3 Statistical Calculations

Statistical	Symbol	Formula	Definition	Uses
Average Relative Percent Difference	RPD	$\frac{\text{RPD}}{n}$	Average relative percent difference - analogous to pooled RSD for duplicate measurements	Used to assess overall performance for compounds with multiple measurements
Confidence Interval	CI	$\frac{X \pm t\langle \alpha, n-1 \rangle^{S}}{n^{1/2}}$	Interval about X that contains the true value, with probability α	Assign intervals or error bars to measurement data
Percent Recovery	R	$\left(\frac{X_{meas}}{X_{true}}\right) \times 100$	Recovery of spiked compound in pure matrix	Recovery of Quality Control check sample, method spikes
Percent Recovery	R	$\frac{\begin{pmatrix}\text{value of} & \text{value of}\\ \text{spiked} & \text{unspiked}\\ \text{sample} & \text{sample}\end{pmatrix}}{\text{Value of added spike}} \times 100$	Recovery of spiked compound in sample matrix	Matrix spike and matrix spike/matrix spike duplicate recovery

X = Observation (concentration)
n = Number of observations
df = Degrees of freedom, usually
t = Statistical from students' "t" distribution

Table A-4. Field Quality Control Sample Collection Guidelines.

QC Sample	Description
Field Duplicate	One per matrix per 20 samples for each analysis.
Equipment Rinsate Blank	One per equipment set per 20 samples collected for each analysis. Only equipment sets that are dedicated or disposed of do not require equipment blanks.
Trip Blank	One per shipment for each cooler in which samples for volatile analysis are shipped. Trip blanks are analyzed for all volatile methods designated for the samples. Trip blanks are shipped for both solid and aqueous matrices.
Field Blank	One per 20 samples collected for each analysis if/when field conditions warrant evaluation of air borne contaminants. Collection decision by the Site Manager.

Field Analyses Data Quality Objectives

Parameter	Method	Precision	Accuracy % Recovery	Completeness %
pH	150.1	0.05 units	$\pm$0.2 units	95
Conductivity	120.1	7.6 umhos/cm	$\pm$2%	95
Temperature	--	0.1^{o}C	$\pm$2^{o}C	95

Calibration Frequency

Analysis	Initial Calibration	Calibration Check	Sample Duplicate
pH	Daily	Every 4 Hours	Daily
Conductivity	Daily	Every 4 Hours	Daily
Turbidity	Daily	Every 4 Hours	Daily

QA Quality Assurance
umhos/cm micromhos per centimeter

Table A-5. Summary of Methods, Containers, Preservatives, and Holding Times.

Parameter	Matrix	Preparation Method	Analytical Method [a]	Container [b]	Preservative	Holding Time [c]
Organic and Metals Methods						
VOCs	Water	5030, 5032	8260	4 x 40-mL vial with Teflon-lined septum	pH < 2 with HCl, Cool 4°C	14 days
	Water	5030, 5032	8260	4 x 40-mL vial with Teflon-lined septum	If effervescence is observed, eliminate HCl preservative and Cool 4°C	7 days
	Solid	5035	8260	3 x Encore™ OR 2 x Sodium Bisulfate vial and 1 x Methanol vial	Cool 4°C	48 hours to preservation for Encore™, then 14 days to analysis
SVOCs	Water	3510, 3520 [d]	8270 (Low Level)	2 x 1-L amber G	Cool 4°C [e]	7 days to extraction and 40 days to analysis
	Solid	3540, 3550 [d]	8270 (Low Level)	1 x 4-oz or 8-oz G	Cool 4°C	14 days to extraction and 40 days to analysis
PAHs	Water	3510, 3520 [d]	8270 SIM)	2 x 1-L amber G	Cool 4°C [e]	7 days to extraction and 40 days to analysis
	Solid	3540, 3525 [d]	8270 SIM	2 x 1-L amber G	Cool 4°C [e]	7 days to extraction and 40 days to analysis
Organochlorine Pesticides	Water	3510, 3520 [d]	8081/608	2 x 1-L amber G	Cool 4°C [e]	7 days to extraction and 40 days to analysis
	Solid	3540, 3550 [d]	8081	1 x 4-oz or 8-oz G	Cool 4°C	14 days to extraction and 40 days to analysis
Organochlorine Herbicides	Water	8151 [d]	8151	2 x 1-L amber G	Cool 4°C [e]	7 days to extraction and 40 days to analysis
	Solid	8151 [d]	8151	1 x 4-oz or 8-oz G	Cool 4°C	14 days to extraction and 40 days to analysis
Metals (except Mercury)	Water	3005, 3010	6010/6020	1 x 500mL HDPE	pH < 2 with HNO_3, Cool 4°C	6 months
	Solid	3050, 3051	6010	1 x 8-oz G	Cool 4°C	6 months
Mercury	Water	NA	7470	1 x 500mL HDPE	pH < 2 with HNO_3, Cool 4°C	28 days
	Solid	NA	7471	1 x 8-oz G	Cool 4°C	28 days

Table A-5. Summary of Methods, Containers, Preservatives, and Holding Times.

Parameter	Matrix	Preparation Method	Analytical Method [a]	Container [b]	Preservative	Holding Time [c]
Total Petroleum Hydrocarbons as GRO	Water	5030, 5032	8015 Modified	4 x 40-mL vial with Teflon-lined septum	pH < 2 with HCl, Cool 4°C	14 days
	Solid	5035	8015 Modified	3 x Encore™ OR 2 x Sodium Bisulfate vial and 1 x Methanol vial	Cool 4°C	48 hours to preservation for Encore™, then 14 days to analysis
Total Petroleum Hydrocarbons as DRO/ORO	Water	3510, 3520 [d]	8015 Modified	2 x 1-L amber G	Cool 4°C [e]	7 days to extraction and 40 days to analysis
	Solid	3540, 3550 [d]	8015 Modified	1 x 4-oz or 8-oz G	Cool 4°C	14 days to extraction and 40 days to analysis
Waste Characterization Parameters						
TCLP Metals [f] (including Mercury)	Solid Waste Material	1311 for Leach/ 3005, 3010	6010 and 7470 (for Leachate)	1 x 8-oz wide-mouth G	Cool 4°C	28 days from collection to Leach; 28 days to analysis of Leachate
TCLP VOCs [f]	Solid Waste Material	1311 for Leach/ 5030	8260 for Leachate	1 x 4-oz G packed full	Cool 4°C	14 days from collection to Leach; 14 days to analysis of Leachate when preserved with HCl to pH < 2
TCLP SVOCs [f]	Solid Waste Material	1311 for Leach/ 3510, 3520	8270 for Leachate	1 x 8-oz wide-mouth G	Cool 4°C	14 days from collection to Leach; 40 days to analysis of Leachate
TCLP Pesticides [f]	Solid Waste Material	1311 for Leach/ 3510, 3520	8081 for Leachate	1 x 8-oz wide-mouth G	Cool 4°C	14 days from collection to Leach; 40 days to analysis of Leachate
TCLP Herbicides [f]	Solid Waste Material	1311 for Leach/ 8151	8151 for Leachate	1 x 8-oz wide-mouth G	Cool 4°C	14 days from collection to Leach; 40 days to analysis of Leachate
Ignitability	Aqueous Waste	NA	1010	500 mL G	NA	NA
	Solid Waste Material	NA	ASTM D-92	1 x 8-oz wide-mouth G	NA	NA

Table A-5. Summary of Methods, Containers, Preservatives, and Holding Times.

Parameter	Matrix	Preparation Method	Analytical Method [a]	Container [b]	Preservative	Holding Time [c]
Reactivity	Aqueous Waste	NA	USEPA Region 4 Guidance for Sulfide	500 mL HDPE	pH > 9 with 2 mL ZnAc and NaOH, Cool 4°C	7 days
	Aqueous Waste	NA	9010/9012/9014 for Cyanide	1 x 120 mL HDPE	pH > 12 with NaOH	14 days
	Solid Waste Material	NA	USEPA Region 4 Guidance for Sulfide	1 x 8-oz wide-mouth G	Cool 4°C	7 days
	Solid Waste Material	NA	9010/9012/9014 for Cyanide	1 x 1-L HDPE	Cool 4°C	Sulfide 7 days
Corrosivity (pH)	Aqueous Waste	NA	9040	120 mL HDPE	NA	24 hours
	Solid Waste Material	NA	9045	1 x 8-oz wide-mouth G	NA	24 hours
General Chemistry Parameters						
Alkalinity	Water	NA	SM 2320 B	500 mL HDPE	Cool 4°C	14 days
Ammonia	Water	NA	SM 4500-NH3 D	500 mL HDPE	pH < 2 with H_2SO_4, Cool 4°C	28 days
Biochemical Oxygen Demand (BOD)	Water	NA	405.1	1 x 1-L HDPE	Cool 4°C	48 hours
Chloride	Water	NA	SM4500-CL/300.0/9056	500 mL HDPE/ 2 x 40 mL vial	Cool 4°C	28 days
Cyanide	Water	NA	9010/9012/9014	1 x 120 mL HDPE	pH > 12 with NaOH, Cool °4C	14 days
	Solid	NA	9010/9012/9014	1 x 4-oz or 8-oz G	Cool 4°C	14 days
Hardness	Water	NA	SM 2340B/6010	500 mL HDPE	Cool 4°C for 130.2/ pH < 2 with HNO_3, Cool 4°C for 6010	6 months
Nitrate	Water	NA	353.2/300.0/9056	120 mL HDPE/	Cool 4°C	2 days
Nitrite	Water	NA	353.2/300.0/9056	120 mL HDPE/	Cool 4°C	2 days
Nitrate/Nitrite	Water	NA	353.2	500 mL HDPE	pH < 2 with H_2SO_4	28 days

Table A-5. Summary of Methods, Containers, Preservatives, and Holding Times.

Parameter	Matrix	Preparation Method	Analytical Method [(a)]	Container [(b)]	Preservative	Holding Time [(c)]
Phosphate	Water	NA	365.3/300.0/9056	500 mL HDPE/ 2 x 40 mL vial	pH < 2 with H_2SO_4	28 days
Sulfate	Water	NA	ASTM 516-90/300.0/9056	500 mL HDPE/ 2 x 40 mL vial	Cool 4°C	28 days
Sulfide	Water	NA	SM 4500-SULFIDE	1-L HDPE	2 mL ZnAc and NaOH to pH > 9, Cool 4°C	7 days
Total Dissolved Solids (TDS)	Water	NA	SM 2540C	500 mL HDPE	Cool 4°C	7 days
Total Suspended Solids (TSS)	Water	NA	SM 2540D	1-L HDPE	Cool 4°C	7 days
Total Organic Carbon (TOC)	Water	NA	415.2/9060	500 mL HDPE	pH < 2 with HCl or H_2SO_4, Cool 4°C	28 days
Dissolved Organic Carbon (DOC)	Water	NA	415.2/9060	500 mL HDPE	AFTER FILTRATION: pH < 2 with HCl or H_2SO_4, Cool 4°C	28 days
Chemical Oxygen Demand	Water	NA	410.4	500 mL HDPE	pH <2 with H_2SO_4	28 days

(a) The 8000 series methods will be used for assessment and remediation; the 600 series methods will be used only for wastewater.
(b) Sample volumes may be combined for parameters where preservatives are the same and adequate sample volume is supplied to the laboratory. Volumes listed are based on sample containers and not minimum volumes required for some of the General Chemistry Parameters listed. All other volumes are minimum volumes required to be submitted to the laboratory.
(c) Maximum holding time allowed from date of collection.
(d) Cleanup methods may be applicable if matrix interference is encountered. Cleanup methods may include alumina (Method 3610), florisil (Method 3620), silica gel (Method 3630), gel permeation chromatography (GPC) (Method 3640), and sulfur (Method 3660). Selection of appropriate method is based on nature of interference and target compounds.
(e) If residual chlorine is present, requires sodium thiosulfate in each sample container.
(f) Waste Characterization addresses solid (soils, drilling mud) material analysis for waste disposal purposes. Liquid (aqueous or organic) wastes will be characterized using the appropriate methods for determination of total constituent concentrations in accordance with waste disposal requirements under the Resource Conservation and Recovery Act (RCRA). TCLP analyses will be performed as required on wastes containing > 0.5% solids in accordance with RCRA waste characterization and disposal requirements.

°C – Degrees Centigrade.
DRO – Diesel Range Organics
GRO – Gasoline Range Organics
H_2SO_4 – Sulfuric acid.
HCl – Hydrochloric acid.
HDPE – High Density Polyethylene.
HNO_3 – Nitric acid.
L – Liter.
mL – Milliliter.

NA – Not Applicable.
NaOH – Sodium hydroxide.
ORO – Oil Range Organics
PAHs – Polycyclic Aromatic Hydrocarbons
SVOCs – Semivolatile Organic Compounds.
TAL – Target Analyte List.
TCL – Target Compound List.
TCLP – Toxicity Characteristic Leaching Procedure.
VOCs – Volatile Organic Compounds.
ZnAc – Zinc acetate.

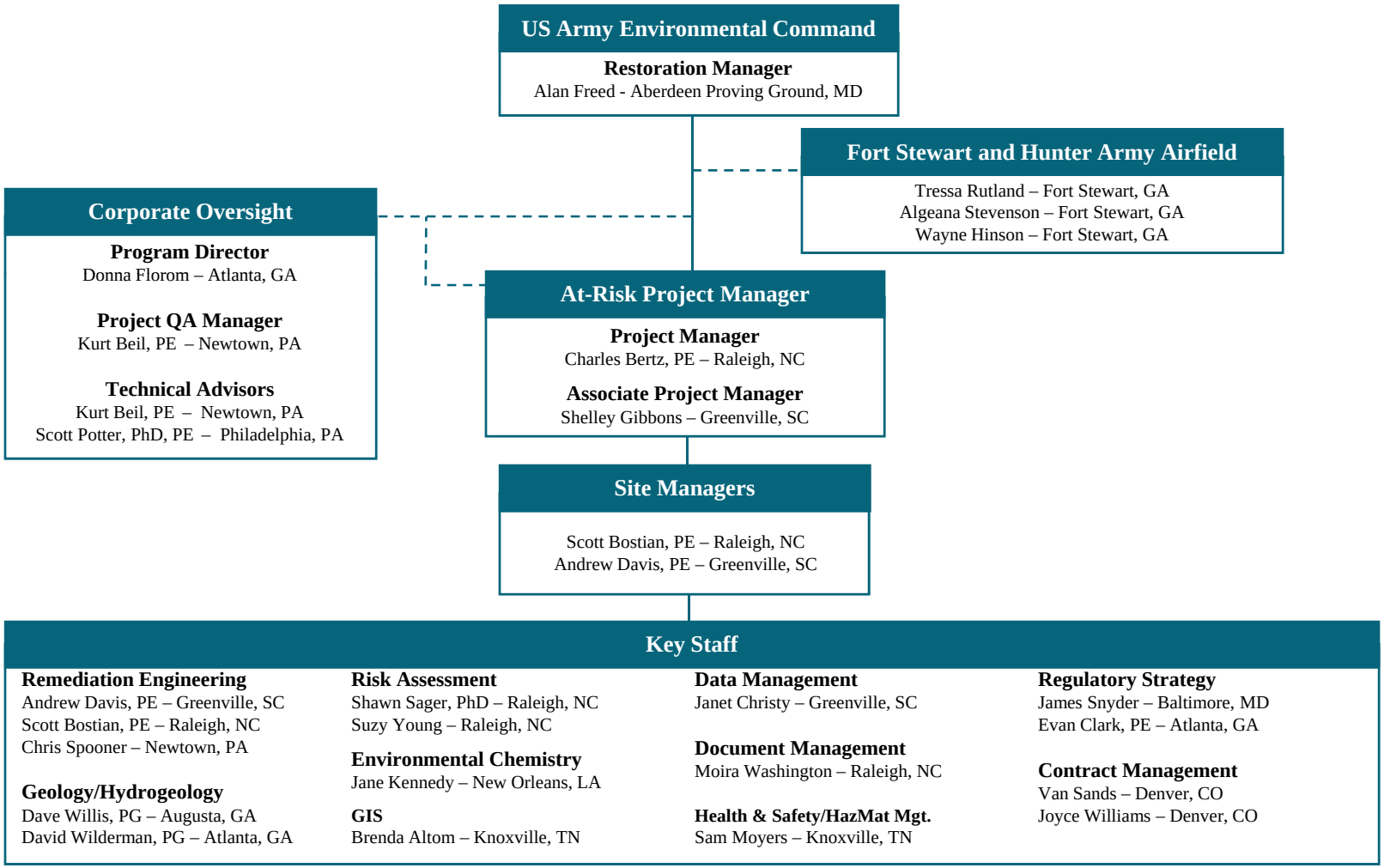
Table A-6. Laboratory Quality Control Sample Analysis Guidelines.

QC Sample	Description
Method Blank	One per matrix per preparation batch for each analysis.
Lab Replicate	One per matrix per preparation batch for each analysis.
Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)	One LCS per matrix per preparation batch for each analysis. LCSD performance is optional.
Surrogate Spiking	All samples analyzed for organic methods as method and Standard Operating Procedure (SOP) appropriate.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One pair per matrix per preparation batch for each analysis. The spike solution will contain a broad range of the analytes of concern, but may not contain all due to incompatibility, interaction, breakdown, availability, or multi-component compounds. The overall frequency of MS/MSD on the project samples must be at least 1 set per 20 samples.

ARCADIS

Figures

Figure A-1
Project Organization
Environmental Restoration PBA
Fort Stewart and Hunter Army Airfield
Georgia



ARCADIS

Appendix B

Field Forms

ARCADIS

Utilities and Structures Checklist

Project: Fort Stewart / Hunter Army Airfield

Prepared By:

Location:

Date:

Instructions: This checklist must be completed by an ARCADIS staff member as a safety measure to insure that all underground utility lines, other underground structures, as well as aboveground power lines are clearly marked out in the area selected for boring or excavation. **DRILLING OR EXCAVATION WORK MAY NOT PROCEED UNTIL LINES ARE MARKED AND THIS CHECKLIST HAS BEEN COMPLETED.** Arrangements for underground utility markouts are best made at the time of the preliminary site visit to allow client and/or utility company sufficient time. Keep completed checklist and maps onsite; send copy to Project Manager.

Assignment of Responsibility: ARCADIS is responsible for having underground utilities and structures located and marked. Preferably, the utilities themselves should mark out the lines.

Emergency Procedures: Follow emergency procedures outlined in site-specific Health and Safety Plan.

Utilities and Structures

Type	Not Present	Present	How Marked? (flags, paint, wooden stakes, etc.)
Natural Gas Line			
Electric Power Line			
Telephone Cable			
Sewer Line			
Storm Drain			
Water Line			
Steam Line			
Petroleum Product Lines			
Product Tank			
Septic Tank/Drain Field			
Overhead Power Line			

Name and Affliation of person who marked or cleared underground lines or structures

ORGANIZATION	NAME	PHONE

Comments:

ARCADIS

Location Sketch

Well(s) _____ Project No. GP08HAFS Page _____ of _____

Site Location _____

Prepared by _____

(Locate all wells, borings, etc. with reference to three permanent reference points: tape all distances: clearly label all wells, roads, and permanent features)





ARCADIS

Boring/Well Construction Log

JOB NUMBER	CLIENT	LOCATION	WELL NO.	PAGE 1 OF ____	WELL LOCATION
GP08HAFS	Fort Stewart / HAAF				N

DRILLING METHOD	SAMPLING METHOD
DRILLING START / FINISH	DEVELOP START / FINISH
STATIC DTW / DTO TIME / DATE	DRILLED BY
ELEVATION TOC / GL	LOGGED BY

WELL CONSTRUCTION	DEPTH FEET	CLASS	NAME	COLOR	DESCRIPTION: GRADATION, SECONDARY CHARACTERISTICS, ODOR, REMARKS.	M.C.	PID/FID (PPM)	SAMPLE NO.	SAMPLE DEPTH	BLOWS	RECOV %	TYPE
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
	11											
	12											
	13											
	14											
	15											
	16											
	17											
	18											
	19											

ARCADIS

Boring/Well Construction Log

JOB NUMBER	CLIENT	LOCATION	WELL NO.	PAGE 1 OF ____	WELL LOCATION
GP08HAFS	Fort Stewart / HAAF				N

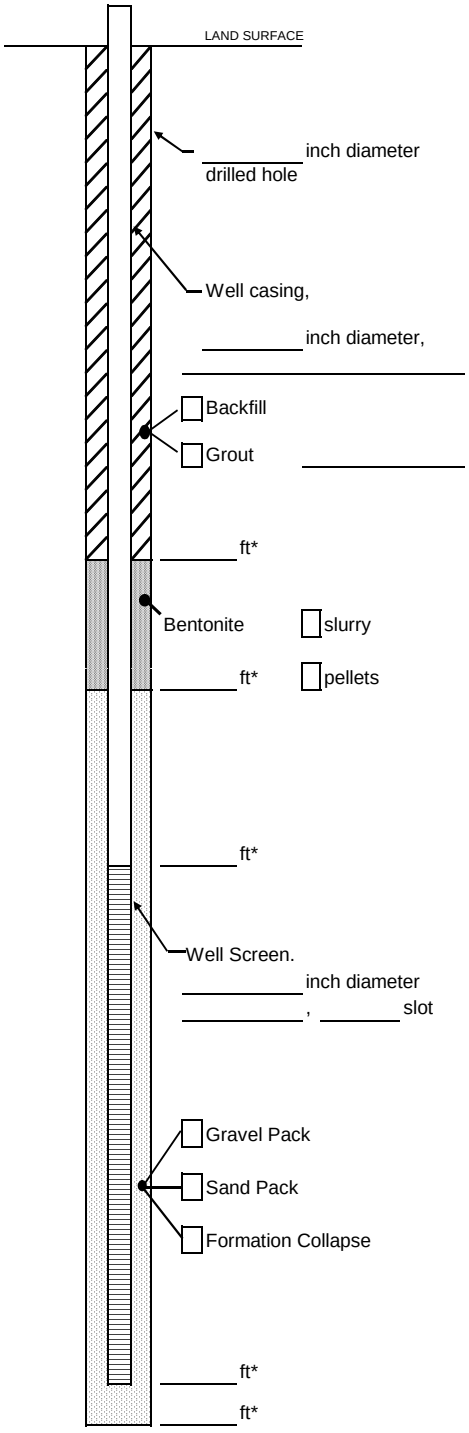
DRILLING METHOD	SAMPLING METHOD
DRILLING START / FINISH	DEVELOP START / FINISH
STATIC DTW / DTO TIME / DATE	DRILLED BY
ELEVATION TOC / GL	LOGGED BY

WELL CONSTRUCTION	DEPTH FEET	CLASS	NAME	COLOR	DESCRIPTION: GRADATION, SECONDARY CHARACTERISTICS, ODOR, REMARKS.	M.C.	PID/FID (PPM)	SAMPLE NO.	SAMPLE DEPTH	BLOWS	RECOV %	TYPE
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
	11											
	12											
	13											
	14											
	15											
	16											
	17											
	18											
	19											

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS Well _____

Town/City _____

County _____ State GA

Permit No. _____

Land-Surface (LS) Elevation and Datum:

_____ feet ☐ Surveyed

☐ Estimated

Installation Date(s) _____

Drilling Method _____

Drilling Contractor _____

Drilling Fluid _____

Development Technique(s) and Date(s)

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P..

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

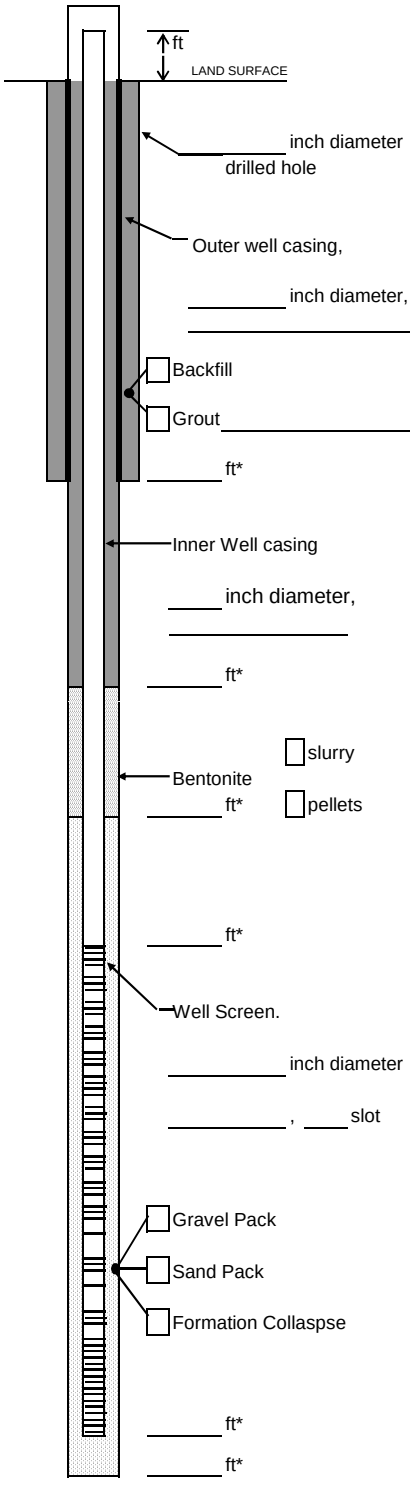
Specific Capacity _____ gpm/ft

Well Purpose Monitoring

Remarks _____

Prepared by _____

WELL CONSTRUCTION LOG- TELESCOPING



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project _____ Well _____

Town/City _____

County _____ State _____

Permit No. _____

Land-Surface Elevation and Datum:

_____ feet ☐ Surveyed

☐ Estimated

Installation Date(s) _____

Drilling Method _____

Drilling Contractor _____

Drilling Fluid _____

_____

Development Technique(s) and Date(s)

_____

_____

_____

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose _____

_____

_____

Remarks _____

_____

_____

_____

_____

Prepared by _____

ARCADIS
Well Development Form

Page ____ of ____

Project/No. GP08HAFS / Fort Stewart/HAAF

Well ID _____

Date _____

Screened Interval _____

Measuring Point Description _____

Well Materials: ____ PVC ____ St. Steel

Static Water Level _____

Casing Diameter (in) _____

Pump On _____

Pump Off _____

Total depth _____

Boring Diameter (in) _____

Pump Intake _____

Water Column _____

Development Method:

Volume Purged (g) _____

Gallons Per Foot _____

Centrifugal _____
Submersible _____
Surge Block _____
Bailed _____
Other _____

Development Criteria: X Boring Vol. ____ Casing Vol. X Parameters

Gallons in Casing/Boring _____

Developed By: _____

Time	Minutes Relapsed	Rate (gpm) or (ML)	DTW (ft)	Gallons Purged	pH	Cond. (umhos) (ms/cm)	Turb (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) or (F)	Remarks

Boring/Casing Volumes
2" = 0.16 3" = 0.37 4" = 0.65 6" = 1.47 8" = 2.61 10 " = 4.08 12" = 5.88

ARCADIS

Geoprobe Groundwater Sampling Form

Project No. GP08HAFS **Boring ID:** **DP-**

Site Location: Fort Stewart / Hunter Army Airfield Date Sampled

Site Description

Weather

Duplicate/QA/QC:

Purging/Sample Collection Information

Casing Material: St. Steel Geoprobe rods Purge Method:(circle one) Bailer Peristaltic Check Valve

Casing Diameter: Geoprobe rods Sample Method: (circle one) Slotted Rods Retractable Screen

Sample ID Boring ID-GW (depth)	Sample Time	Water Column	Gallons/ Foot	Volume Purged	Turbidity	Color	Odor	Lab	Other

Lab Analysis

Constituents Sampled	Container Description	Preservative

Remarks

Sample Personnel

Purge volume = Water Column (ft) x 0.02

Water Column = Sample Depth - Depth to Water

WELL SAMPLING SUMMARY

ARCADIS Project Number: GP08HAFS *Project Name: Fort Stewart / HAAF* *Sampler:*		*Collection Date (mm/dd/yy)*	*Collection Time (hr.min)*	*Initial Depth to Water (ft btoc)*	*Well Volume (gallons)*	*Total Depth (ft)*	*Total Volume Removed (gallons)*	*Final*							*Comment*
Sample ID	*Location ID*							*pH*	*Cond. (umhos)*	*Temp. (oC)*	*Turb. (NTU)*	*ORP*	*DO*	*TDS*	

( ) = Enter the collection date within the parenthesis (ie. 011904)

ARCADIS

Water Level Measurement Form

Project No: GP08HAFS
Location: Fort Stewart / Hunter Army Airfield

Date: _____
Recorded By: _____

Well Number	Time	TOC Elevation (ft)	Static Depth to Water (ft btoc)	Duplicate Reading (ft btoc)	GW Elevation (ft msl)	Total Depth (ft btoc)	Comments

ft btoc Feet below top of casing.

ARCADIS

WATER LEVEL/PUMPING TEST RECORD

PROJECT ______________ WELL ______________ SITE ______________

SCREEN SETTING ______________ MEASURING POINT DESCRIPTION ______________ HEIGHT ABOVE GROUND SURFACE ______________

STATIC WATER LEVEL ______________ MEASURED WITH ______________ DATE/TIME ______________

DRAWDOWN ______________ START OF TEST ______________ PUMPING WELL ______________

RECOVERY ______________ END OF TEST ______________

DISTANCE FROM WELL MEASURED TO PUMPING WELL [r] ______________ DISCHARGE RATE ______________ ORIFICE ______________

DATE & TIME	WELL OR t (mins)	HELD (ft)	WET (ft)	DEPTH TO WATER (ft)	s (ft)	DEW. [1] CORR. (ft)	ART. [2] s' (ft)	Q (gpm)	MANO-METER (in)	REMARKS [3]

ARCADIS

WATER LEVEL/PUMPING TEST RECORD

PROJECT ______________________________ WELL __________________________ SITE ____

DATE & TIME	WELL OR t (mins)	HELD (ft)	WET (ft)	DEPTH TO WATER (ft)	s (ft)	DEW.[1] CORR. (ft)	ART.[2] s' (ft)	Q (gpm)	MANO-METER (in)	REMARKS[3]

Sample Key

				Analysis/Parameters																					
ARCADIS Project Number: GP08HAFS				Lab																Field					
Project Name: Fort Stewart / Hunter Army Airfield																									
Sampler:																									
Laboratory:																									
Sample ID	**Location ID**	**Collection Date (mm/dd/yy)**	**Collection Time (hr:min)**	*TOC (9060)*	*Aluminum (6010B)*	*Metals (App IX) (6010B)*	*SVOCs (8270C)*	*VOCs (8260B)*	*Alkalinity (310.1)*	*Pesticides (8081A)*	*Hex Chrome (7196A)*	*Total Iron (6010)*	*Carbon Dioxide (AM20G)*	*Sulfate (9056)*	*Nitrate and Nitrite (9056)*	*Chlorides (9056)*	*Methane, Ethane, and Ethene (AM20G)*	*pH*	*DO,ORP,temp., turbidity, conductivity*	**Sample Type**	**Matrix Code**	**Location Description**	**Chain of Custody**	**Parent Sample ID**	**Comment**

( ) = Enter the collection date within the parenthesis (ie. 011904)

* If more than one TB is colleced in one day then name the Trip Blanks sequentially (ie. TB1( ), TB2( ), etc.)

**The time on the COC needs to be the same for MS/MSD as the parent sample.

SAMPLING LOCATION SURVEY SUMMARY

ARCADIS Project Number: GP08HAFS			*Ground Elevation (ft. AMSL)*	*Top of Casing Elevation*		*Depth-to-Water Reference Elevation (ft. AMSL)*	*Comment*
Project Name: Fort Stewart / Hunter Army Airfield							
Sampler:							
Laboratory:							
Location	*Easting**	*Northing**		*Inner (ft. AMSL)*	*Protective/Outer (ft. AMSL)*		

* - Please provide reference for the coordinate system used.

ARCADIS

Soil/Sediment Sample Log

Project/Site Location: Fort Stewart / Hunter Army Airfield Project No.: GP08HAFS

Sample No.: _____ Duplicate/QA/QC: _____

Date: _____ Weather: _____

Site Description: _____

Sampling Method and Material: Geoprobe MacroCore with liner, stainless steel sampling spoon

Sample ID Boring ID-SO (depth)	Sample Time	Soil Class.	Soil Description (Color, description, moisute, odor, etc.)	PID/FID Reading	Offsite Lab Analysis?

Lab Analysis

Constituents Sampled	Container Description	Preservative

Remarks: _____

Sample Personnel: _____

SOIL SAMPLING SUMMARY

ARCADIS Project Number: GP08HAFS							
Project Name: Fort Stewart / HAAF							
Sampler:							
Laboratory:							
Sample ID	*Location ID*	*Collection Date (mm/dd/yy)*	*Collection Time (hr.min)*	*Estimated Ground Elevation (ft. AMSL)*	*Sample Start Depth (ft bgs)*	*Sample End Depth (ft bgs)*	*Comment*

Note: Sample ID = Location ID(Sample Start Depth-Sample End Depth)

ARCADIS

Groundwater Sampling Form

Site Location: Fort Stewart/HAAF Project No. GP08HAFS **Well ID:** _____

Date: _____ Sampled By: _____

Sampling Time: _____ Recorded By: _____

Weather: _____ Duplicate/QA/QC: _____

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:		

Purging Information

Casing Material: _____

Casing Diameter: _____

Total Depth: _____

Depth to Water: _____

Water Column: _____

Gallons/Foot: _____

Gallons in Well: _____

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer Peristaltic

Screen Interval: From: _____ To: _____

Pump Intake Setting: _____

Volumes to be Purged: _____

Total Volume Purged: _____

Pump On: _____ Off: _____

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (ºC or ºF)	Diss. Oxygen	Comments

Observations During Sampling

Well Condition: _____

Color: _____

Odor: _____

Purge Water Disposal: _____

Turbidity(qualitative): _____

Other (OVA, HNU,etc.): _____

Constituents Sampled	Container Description: From Lab _____ ARCADIS _____	Preservative

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

SURFACE WATER SAMPLE LOG

Sample ID _____ Project/No. _____

Date _____ Sampling Personnel _____

Time _____ _____

Weather _____

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body _____

Depth of Water _____ Velocity _____

Other Comments _____

Substrate Description _____

Location _____

_____

Description of Nearby Vegetation _____

FIELD PARAMETERS:

Sample Method _____

Sample Description _____

_____

Temperature (°C/°F) _____ pH _____

Dissolved Oxygen _____ SC _____

Salinity _____

CONTAINER DESCRIPTION: From _____ Lab _____

Bottle Type	Analysis	Preservative

ARCADIS
CALIBRATION FORM
PHOTOIONIZATION DETECTOR

Project: **Fort Stewart / Hunter Army Airfield**

Location:

PID Model: **Multi Rae**

Pre-Use Calibration

Date:_____ Time:_____am/pm

5 minute (minimum) warm up in ambient air: YES ☐ NO ☐

Battery indicator reading (e.g., 10 through +20): _____

Instrument zeroed (ambient air): YES ☐ NO ☐

Span gas pressure (e.g., 30 psi minimum to 300 psi):

Calibration gas used is 100 ppm Isobutylene/air: YES ☐ NO ☐

Benzene Referenced: YES ☐ NO ☐

Calibration Value: _____

Post-Use Calibration

Date:_____ Time:_____am/pm

Ambient air reading (e.g., 0 ppm): _____ppm

Battery indicator reading (e.g., 10 through +20): _____

Calibration Value: _____

Comments and description of work activities performed during monitoring:

_____

_____

_____

Calibrated by:_____

ARCADIS

Field Instrument Calibration Log

Project Name/Number _____ Date _____

Calibrating Personnel _____ Instrument _____

Time of Initial Calibration _____ Weather _____

Calibrant	Initial Reading	Adjusted Reading	Final Reading	Time	Temperature

ARCADIS

Daily Log

Well(s) _____ Project No. GP08HAFS Page _____ of _____

Site Location Fort Stewart / Hunter Army Airfield

Prepared by _____

Date/Time	Description of Activities

ARCADIS GERAGHTY & MILLER Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page _____ of _____

Project Number/Name _____

Project Location _____

Laboratory _____

Project Manager _____

Sampler(s)/Affiliation _____

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE						Remarks	Total

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers _____

Relinquished by: _____	Organization: _____	Date ___/___/___	Time _____	Seal Intact?
Received by: _____	Organization: _____	Date ___/___/___	Time _____	Yes No N/A
Relinquished by: _____	Organization: _____	Date ___/___/___	Time _____	Seal Intact?
Received by: _____	Organization: _____	Date ___/___/___	Time _____	Yes No N/A

Special Instructions/Remarks: _____

Delivery Method: ☐ In Person ☐ Common Carrier _____ (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

APPENDIX I

Field Forms and Field Logs (2009 – 2012)

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: B-1 | Project/No.: GP08HAFS.H01B.DG0FI | Page: 1 of 1

Site Location: Hunter AAF (HAA-01) | Drilling Started: 15:15 | Drilling Completed: 15:26 (11/3/09)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: M. Carey | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) | Sampling Interval: 8.0' to 10.0' feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 10.0 Feet | Hole Diameter: 2.25 | Coring Device: Hand-Auger (to 3'), MacroCore (3' - 10')

Prepared By: B. Wolf | Hammer Weight: _____ | Hammer Drop: _____ ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
8.0" - 10.0"	Grab	15:30	VOCs, SVOCs, Metals

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.0	1.0	0.0	N/A	Brown, fine grained, poorly graded, SAND, loose, organic matter present
1.0	3.0	2.0	0.0	N/A	Tan, fine grained, poorly graded, SAND, loose
3.0	5.0	2.0	0.0	N/A	Same as above
5.0	7.5	2.5	0.0	N/A	Tan/orange, fine grained, poorly graded, SAND, loose
7.5	10.0	2.5	0.0	N/A	Tan/white, fine grained, poorly graded, SAND, loose

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: B-2 | Project/No.: GP08HAFS.H01B.DG0FI | Page: 1 of 1

Site Location: Hunter AAF (HAA-01) | Drilling Started: 14:50 | Drilling Completed: 15:03 (11/3/06)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: M. Carey | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) | Sampling Interval: 6.0' to 6.5' feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 6.5 Feet | Hole Diameter: 2.25 | Coring Device: Hand-Auger (to 3'), MacroCore (3' - 6.5')

Prepared By: B. Wolf | Hammer Weight: _____ | Hammer Drop: _____ ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
6.0' - 6.5'	Grab	15:08	SVOCs

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.0	1.0	0.0	N/A	Dark brown, fine grained, poorly graded, SAND, loose, organic matter present
1.0	2.5	1.5	0.0	N/A	Tan, fine grained, poorly graded, SAND, loose, becoming lighter in color w/depth
2.5	3.0	0.5	0.0	N/A	Tan/brown with red/orange mottles, fine grained, clayey SAND, medium dense
3.0	5.5	2.5	0.0	N/A	Brown, fine grained, poorly graded SAND with silt, loose
5.5	6.5	1.0	0.0	N/A	Same as above

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: B-3 | Project/No.: GP08HAFS.H01B.DG0FI | Page: 1 of 1

Site Location: Hunter AAF (HAA-01) | Drilling Started: 14:27 | Drilling Completed: 14:38 (11/3/09)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: M. Carey | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) | Sampling Interval: 8.0' to 10.0' feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 10.0 Feet | Hole Diameter: 2.25 | Coring Device: Hand-Auger (to 3'), MacroCore (3' - 10')

Prepared By: B. Wolf | Hammer Weight: _____ | Hammer Drop: _____ ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
8.0' - 10.0'	Grab	14:40	SVOCs

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	3.0	3.0	0.0	N/A	Brown, fine grained, poorly graded, SAND, loose, organic matter present
3.0	5.0	2.0	0.0	N/A	Tan, fine grained, poorly graded, SAND, loose
5.0	5.5	0.5	0.0	N/A	Same as above
5.5	6.5	1.0	0.0	N/A	Tan, fine grained, clayey SAND, med dense, slightly plastic
6.5	10.0	3.5	0.0	N/A	Tan/white, fine grained, poorly graded, SAND, loose, wet

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: B-4 | Project/No.: GP08HAFS.H01B.DG0FI | Page: 1 of 1

Site Location: Hunter AAF (HAA-01) | Drilling Started: 13:48 | Drilling Completed: 14:15 (11/3/09)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: M. Carey | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hand-Auger

Length and Diameter of Coring Device: 1.5' x 3" | Sampling Interval: 2.0' to 4.0' feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 4.0 Feet | Hole Diameter: 3.0" | Coring Device: Hand-Auger

Prepared By: B. Wolf | Hammer Weight: _____ | Hammer Drop: _____ ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
2.0' - 4.0'	Grab	14:17	Metals (chromium)

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.0	1.0	0.0	N/A	Dark brown, fine grained, poorly graded, SAND, organic matter & rocks present
1.0	4.0	3.0	0.0	N/A	Dark brown, fine grained, poorly graded, SAND, loose

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: B-5 | Project/No.: GP08HAFS.H01B.DG0FI | Page: 1 of 1

Site Location: Hunter AAF (HAA-01) | Drilling Started: 13:29 | Drilling Completed: 13:37 (11/3/09)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: M. Carey | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hand-Auger

Length and Diameter of Coring Device: 1.5' x 3" | Sampling Interval: 0.0' to 2.0' feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 2.0 Feet | Hole Diameter: 3.0" | Coring Device: Hand-Auger

Prepared By: B. Wolf | Hammer Weight: _____ | Hammer Drop: _____ ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
0.0' - 2.0'	Grab	13:37	Metals (chromium)

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.0	1.0	1.6	N/A	Dark brown/gray, fine grained, poorly graded, SAND with silt, organic matter present
1.0	2.0	1.0	0.0	N/A	Dark brown, fine grained, poorly graded, SAND

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-9 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 1

Site Location: Hunter AAF (HAA-01)
Drilling Started: 14:49
Drilling Completed: 15:25 (11/4/09)

Drilling Contractor: ARM Environmental Services, Inc.
Driller: M. Carey
Helper: J. Watson

Drilling Fluid Used: None
Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore)
Sampling Interval: 1.0'-2.0', 9.0'-10.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 20.0 Feet
Hole Diameter: 2.25
Coring Device: Hand-Auger (to 3'), MacroCore (3' - 20')

Prepared By: B. Wolf
Hammer Weight: _____
Hammer Drop: _____ ins.

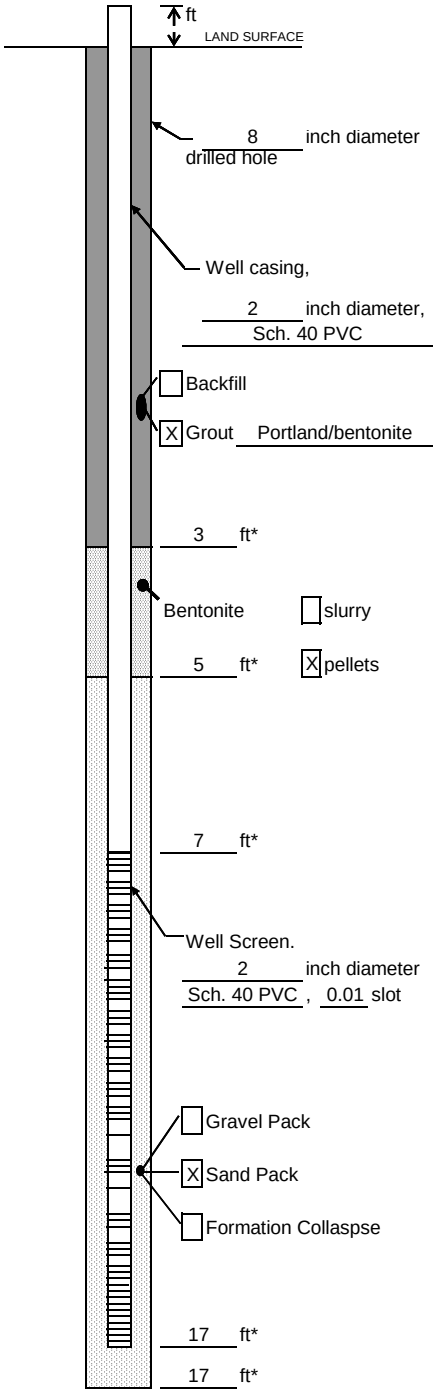
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	15:05	VOCs, Metals, Pesticides
9.0' - 10.0'	Grab	16:40	VOCs, Metals

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	3.5	3.5	5.9	N/A	Brown, fine grained, poorly graded, SAND with silt, loose
3.5	3.75	0.25	0.0	N/A	Asphalt
3.75	4.5	0.75	0.0	N/A	Brown, fine grained, poorly graded, SAND with silt, loose
4.5	5.0	0.5	0.0	N/A	Rock/asphalt
5.0	10.0	5.0	0.0	N/A	Brown/tan/black, fine grained, poorly sorted, SAND with silt, loose, rock and asphalt fragements present
10.0	11.0	1.0	0.0	N/A	Same as above
11.0	14.0	3.0	0.0	N/A	Brown, fine grained, poorly graded, silty SAND, loose, saturated, concretions present between 12.0' and 14.0'
14.0	15.0	1.0	0.0	N/A	Tan, fine grained, poorly graded, SAND with silt, loose, saturated
15.0	18.0	3.0	0.0	N/A	Same as above
18.0	19.0	1.0	0.0	N/A	Gray, fine grained, poorly graded, silty SAND, loose, saturated
19.0	20.0	1.0	0.0	N/A	Gray, sandy CLAY, soft, plastic, saturated

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-9

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/5/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump with surge block

Development conducted by ARM Environmental Services, Inc.

on 11/13/2009.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 50 gallons

Static Depth to Water 11.72 feet below M.P.

Pumping Depth to Water 20.08 feet below M.P.

Pumping Duration 1 hours

Yield 0.833 gpm Date 11/13/2009

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks

Prepared by B. Wolf

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-10 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 1

Site Location: Hunter AAF (HAA-01)
Drilling Started: 14:20
Drilling Completed: 15:16 (11/9/09)

Drilling Contractor: ARM Environmental Services, Inc.
Driller: J. Register
Helper: J. Watson

Drilling Fluid Used: None
Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore)
Sampling Interval: 1.0'-2.0', 3.0'-4.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 15.0 Feet
Hole Diameter: 2.25
Coring Device: Hand-Auger (to 3'), MacroCore (3' - 15')

Prepared By: B. Wolf
Hammer Weight: _____
Hammer Drop: _____ ins.

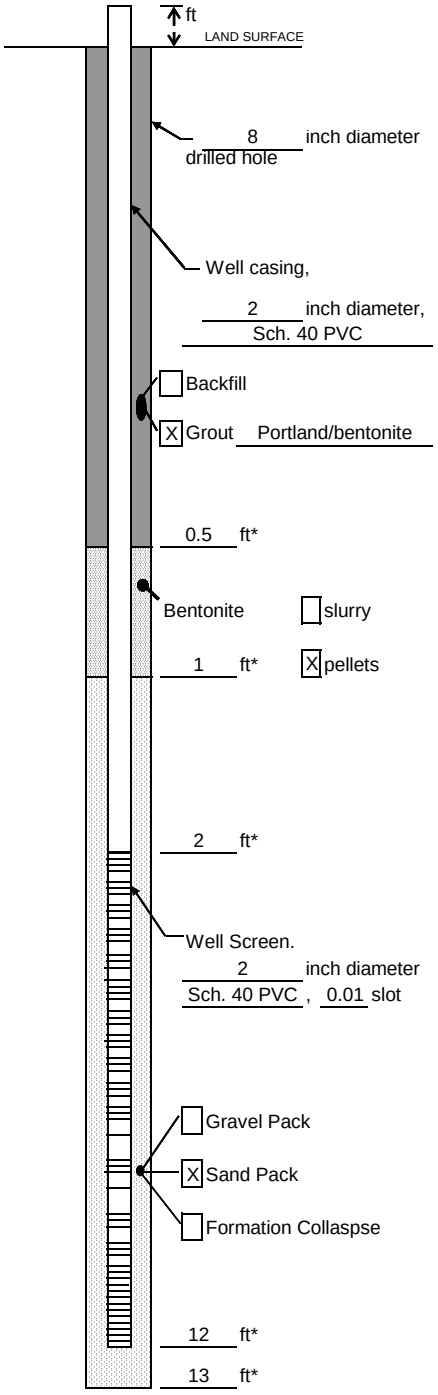
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	14:25	VOCs, Metals, Pesticides
3.0' - 4.0'	Grab	15:20	VOCs, Metals

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.25	1.25	0.0	N/A	Tan, fine grained, poorly graded, SAND with silt, loose, organic matter present
1.25	5.0	3.75	0.0	N/A	Dark brown and gray, fine grained, poorly graded, SAND with silt, loose
5.0	5.5	0.5	0.0	N/A	Same as above, but dark brown and tan in color
5.5	7.0	1.5	0.0	N/A	Dark brown, fine grained, poorly graded, silty SAND, loose, saturated
7.0	7.5	0.5	0.0	N/A	Dark brown, fine grained, poorly graded, silty SAND, medium dense, moist
7.5	9.0	1.5	0.0	N/A	Brown, fine grained, poorly graded, SAND with silt, wet
9.0	13.0	4.0	0.0	N/A	Tan, fine grained, poorly graded, SAND, medium dense, saturated
13.0	15.0	2.0	0.0	N/A	Gray, fine grained, poorly graded, SAND with silt, loose to medium dense, saturated

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-10

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/9/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump with surge block

Development conducted by ARM Environmental Services, Inc.

on 11/13/2009.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 25 gallons

Static Depth to Water 5.76 feet below M.P.

Pumping Depth to Water 15.08 feet below M.P.

Pumping Duration 1 hours

Yield gpm Date 11/13/2009

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent during the 1 hour pumping duration and an accurate yield could not be calculated.

Prepared by B. Wolf

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-11 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 1

Site Location: Hunter AAF (HAA-01)
Drilling Started: 16:38
Drilling Completed: 17:24 (11/9/09)

Drilling Contractor: ARM Environmental Services, Inc.
Driller: J. Register
Helper: J. Watson

Drilling Fluid Used: None
Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore)
Sampling Interval: 1.0'-2.0', 2.0'-3.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 15.0 Feet
Hole Diameter: 2.25
Coring Device: Hand-Auger (to 3'), MacroCore (3' - 15')

Prepared By: B. Wolf
Hammer Weight: _____
Hammer Drop: _____ ins.

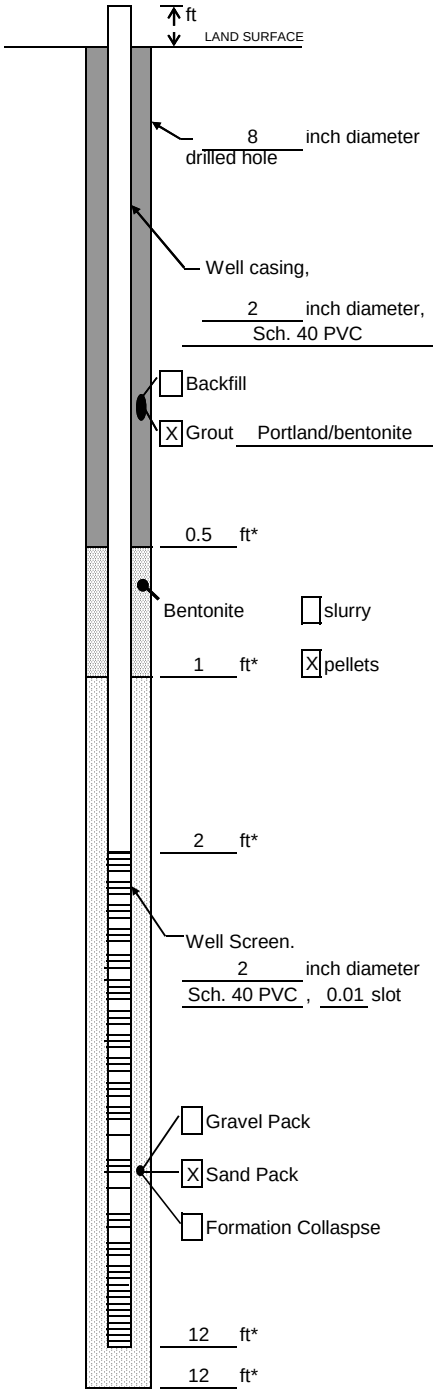
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	16:42	VOCs, Metals, Pesticides
2.0' - 3.0'	Grab	17:00	VOCs, Metals
2.0' - 3.0'	Grab	17:00	VOCs, Metals (Duplicate sample)

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	3.0	3.0	0.0	N/A	Dark brown to black, fine grained, poorlly graded, silty SAND, loose, organic matter present
3.0	4.0	1.0	0.0	N/A	Dark brown, fine grained, clayey SAND, medium dense, wet
4.0	5.0	1.0	0.0	N/A	Same as above, but less silt and clay
5.0	6.0	1.0	0.0	N/A	Same as above, but saturated
6.0	6.5	0.5	0.0	N/A	Dark brown to black, sandy CLAY, stiff, plastic
6.5	7.0	0.5	0.0	N/A	Brown, fine grained, poorly graded, silty SAND, medium dense, moist
7.0	8.5	1.5	0.0	N/A	Tan, fine grained, poorly graded, silty SAND, medium dense, moist
8.5	10.0	1.5	0.0	N/A	Gray, fine grained, poorly graded, silty SAND, medium dense, saturated
10.0	15.0	5.0	0.0	N/A	Same as above

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-11

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/9/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump with surge block

Development conducted by ARM Environmental Services, Inc. on 11/24/2009.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 48 gallons

Static Depth to Water 4.55 feet below M.P.

Pumping Depth to Water 15 feet below M.P.

Pumping Duration 2.25 hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent during the 2.25 hour pumping duration and an accurate yield could not be calculated.

Prepared by B. Wolf

SOIL CORE / SAMPLING LOG

Boring/Wel MW-12 / MW-12D Project/No. GP08HAFS.H01B.DG0FI Page 1 of 2

Site Location Hunter AAF (HAA-01) Drilling Started 9:10 Drilling Completed 10:20 (11/6/09)

Drilling Contractor ARM Environmental Services, Inc. Driller M. Carey Helper J. Watson

Drilling Fluid Used None Drilling Method Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) Sampling Interval 1.0'-2.0', 3.0'-4.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled 50.0 Feet Hole Diameter 2.25 Coring Device Hand-Auger (to 3'), MacroCore (3' - 40')

Prepared By B. Wolf Hammer Weight _____ Hammer Drop _____ ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	11:00	VOCs, Metals, Pesticides
3.0' - 4.0'	Grab	11:10	VOCs, Metals
3.0' - 4.0'	Grab		VOCs, Metals (MS collected at 11:15, MSD collected at 11:20)

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.0	1.0	0.0	N/A	Dark brown, fine grained, poorlly graded, silty SAND, loose, organic matter present
1.0	2.5	1.5	0.0	N/A	Brown/gray, fine grained, poorly graded, silty SAND, loose
2.5	4.5	2.0	0.0	N/A	Brown, fine grained, poorly graded, silty SAND, loose to medium dense, moist at approximately 3'
4.5	7.5	3.0	0.0	N/A	Brown, fine grained, silty SAND, with alternating bands of brown, medium stiff, plastic, sandy CLAY, wet
7.5	9.75	2.25	0.0	N/A	Tan, fine grained, poorly graded, silty SAND, medium dense, saturated
9.75	10.0	0.25	0.0	N/A	Gray, fine grained, poorly graded, SAND, medium dense, saturated
10.0	12.0	2.0	0.0	N/A	Tan, very fine grained, poorly graded, SAND, loose, saturated
12.0	15.0	3.0	0.0	N/A	Gray, fine grained, poorly graded, SAND with silt, loose, saturated
15.0	22.0	7.0	0.0	N/A	Same as above
22.0	22.25	0.25	0.0	N/A	Gray, fine to medium grained, silty SAND, loose, saturated
22.25	24.5	2.25	0.0	N/A	Gray, clayey SAND, loose, moderately plastic, saturated
24.5	27.0	2.5	0.0	N/A	Gray, fine grained, poorly graded, SAND with silt, medium dense, saturated
27.0	28.5	1.5	0.0	N/A	Gray, fine grained, poorly graded, SAND with silt, with alternating bands of gray, fine grained, silty SAND, saturated
28.5	30.0	1.5	0.0	N/A	Gray, fine to medium grained, moderately well graded, SAND with silt, loose, sub-angular to sub-rounded grains, saturated
30.0	35.0	0.5	0.0	N/A	Gray, fine to medium grained, sandy CLAY, stiff, plastic, lost most of core
35.0	37.5	2.5	0.0	N/A	Gray/tan, fine to medium to coarse grained, well graded, SAND, sub-angular to sub-rounded grains, saturated
37.5	40.0	2.5	0.0	N/A	Gray, CLAY, stiff, plastic, some fine to medium grained sand present
					Geoprobe encounters refusal at 40', resume coring with split spoons advanced through hollow-stem augers.

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: MW-12 / MW-12D | Project/No.: GP08HAFS.H01B.DG0FI | Page: 2 of 2

Site Location: Hunter AAF (HAA-01) | Drilling Started: 9:10 | Drilling Completed: 10:20 (11/6/09)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: B. Ewing | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hollow stem auger

Length and Diameter of Coring Device: 2.0' x 2.0" | Sampling Interval: _____ feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 50.0 Feet | Hole Diameter: 2.0" | Coring Device: Split spoon sampler (40'-42' and 45'-47')

Prepared By: B. Wolf | Hammer Weight: 180 lbs | Hammer Drop: 36 ins.

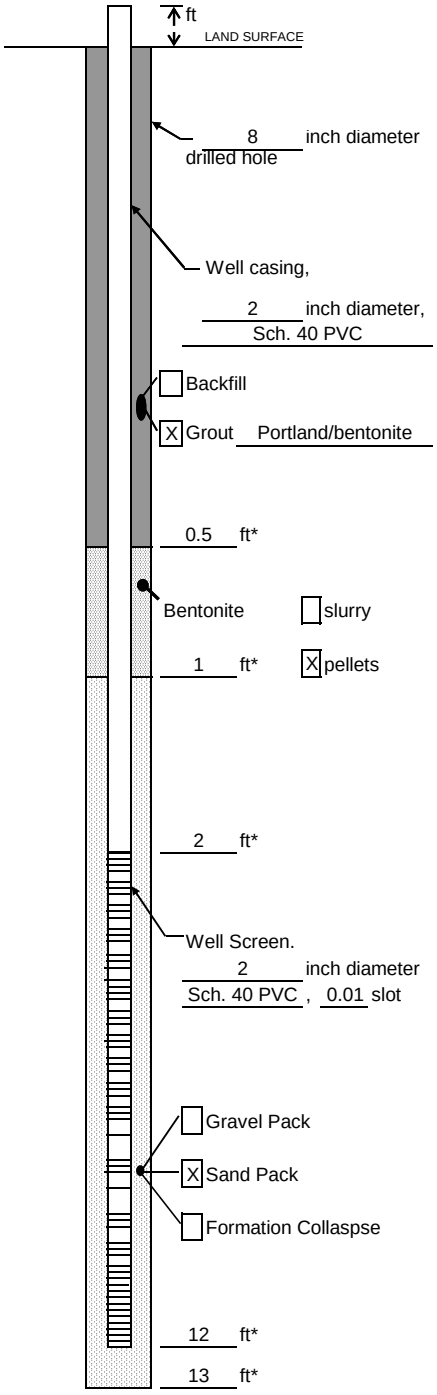
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	11:00	VOCs, Metals, Pesticides
3.0' - 4.0'	Grab	11:10	VOCs, Metals
3.0' - 4.0'	Grab		VOCs, Metals (MS collected at 11:15, MSD collected at 11:20)

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
40.0	42.0	2.0	0.0	8,8,8,6	Gray, sandy CLAY, stiff, plastic
45.0	47.0	2.0	0.0	1,1,1,1	Tan/green, fine to medium to coarse grained, well graded, clayey SAND, medium dense, saturated

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-12

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/9/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump with surge block

Development conducted by ARM Environmental Services, Inc.

Inc. on 11/24/2009

Fluid Loss During Drilling N/A gallons

Water Removed During Development 48 gallons

Static Depth to Water 5.7 feet below M.P.

Pumping Depth to Water 15.3 feet below M.P.

Pumping Duration 3.8 hours

Yield gpm Date

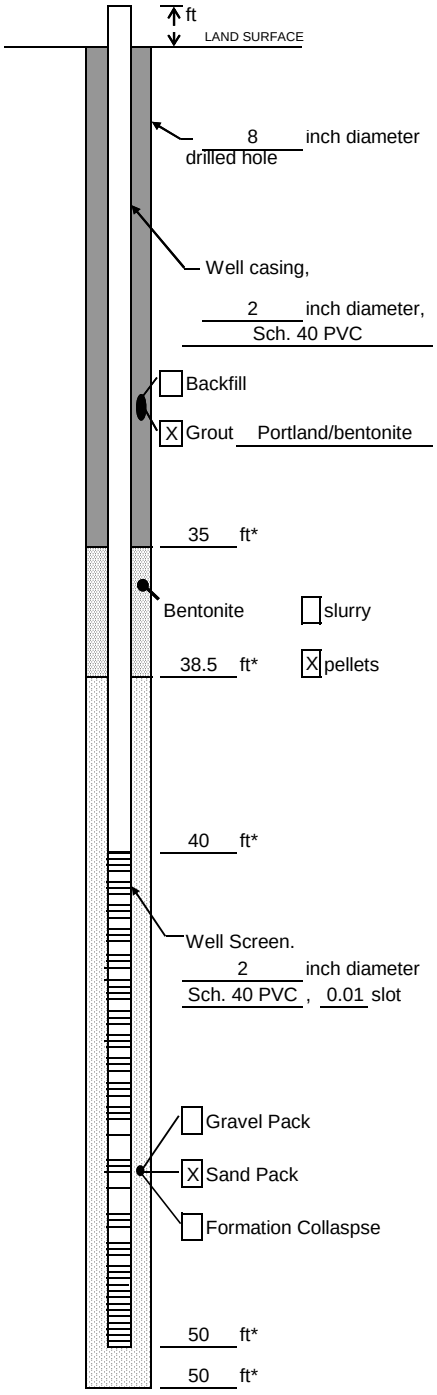
Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent during the 3.8 hour pumping duration and an accurate yield could not be calculated.

Prepared by B. Wolf

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-12D

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/9/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump

Fluid Loss During Drilling N/A gallons

Water Removed During Development 90 gallons

Static Depth to Water 5.6 feet below M.P.

Pumping Depth to Water 53.2 feet below M.P.

Pumping Duration 3 hours

Yield 0.5 gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks

Prepared by B. Wolf

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-13 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 1

Site Location: Hunter AAF (HAA-01) Drilling Started: 9:53 Drilling Completed: 10:30 (11/10/09)

Drilling Contractor: ARM Environmental Services, Inc. Driller: J. Register Helper: J. Watson

Drilling Fluid Used: None Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) Sampling Interval: 1.0'-2.0', 4.0'-5.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 15.0 Feet Hole Diameter: 2.25 Coring Device: Hand-Auger (to 3'), MacroCore (3' - 15')

Prepared By: B. Wolf Hammer Weight _____ Hammer Drop _____ ins.

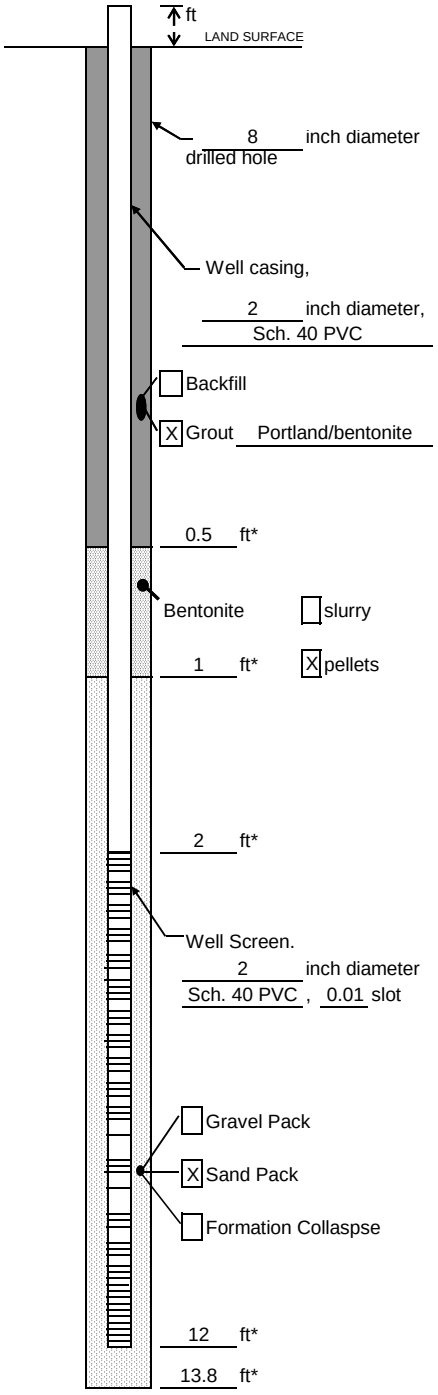
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	10:00	VOCs, Metals, Pesticides
4.0' - 5.0'	Grab	10:35	VOCs, Metals

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.0	1.0	0.0	N/A	Dark brown to black, fine grained, poorlly graded, silty SAND, loose, moist
1.0	1.25	0.25	0.0	N/A	Brown to tan, fine grained, poorly graded, SAND with silt, loose
1.25	1.5	0.25	0.0	N/A	Tan, fine grained, poorly graded, SAND with silt, loose
1.5	3.5	2.0	0.0	N/A	Same as above
3.5	4.75	1.25	0.0	N/A	Tan/brown mottled, fine grained, poorly graded, silty SAND, medium dense
4.75	5.5	0.75	0.0	N/A	Same as above, but more silt and clay
5.5	6.5	1.0	0.0	N/A	Brown, fine grained, poorly graded, silty SAND, medium dense
6.5	8.0	1.5	0.0	N/A	Tan, fine grained, poorly graded, SAND with silt, loose, wet at 7.0'
8.0	10.0	2.0	0.0	N/A	Gray, fine grained, poorly graded, silty SAND, medium dense, saturated
10.0	15.0	5.0	0.0	N/A	Same as above

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-13

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/10/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump with surge block

Development conducted by ARM Environmental services on 11/25/2009.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 30.5 gallons

Static Depth to Water 4.15 feet below M.P.

Pumping Depth to Water 15 feet below M.P.

Pumping Duration 2.5 hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent during the 2.5 hour pumping duration and an accurate yield could not be calculated.

Prepared by B. Wolf

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: MW-14 / MW-14D | Project/No.: GP08HAFS.H01B.DG0FI | Page: 1 of 2

Site Location: Hunter AAF (HAA-01) | Drilling Started: 14:45 | Drilling Completed: 17:20 (11/5/09)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: M. Carey | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) | Sampling Interval: 1.0'-2.0', 3.0'-4.0' feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 50.0 Feet | Hole Diameter: 2.25 | Coring Device: Hand-Auger (to 3'), MacroCore (3' - 45')

Prepared By: B. Wolf | Hammer Weight: _____ | Hammer Drop: _____ ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	9:00	VOCs, Metals, Pesticides
3.0' - 4.0'	Grab	9:10	VOCs, Metals
			Samples collected from boring advanced at MW-14 on 11/6/09

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	2.0	2.0	0.0	N/A	Brown, fine grained, poorlly graded, SAND with silt, loose, organic matter present
2.0	3.0	1.0	0.0	N/A	Tan, fine grained, poorly graded, SAND with silt, loose
3.0	5.0	2.0	0.0	N/A	Dark brown and gray, fine grained, poorly graded, silty SAND, loose
5.0	5.5	0.5	0.0	N/A	Same as above, but moist
5.5	8.5	3.0	0.0	N/A	Same as above, but more silt and clay present near 8.5', and wet.
8.5	10.0	1.5	0.0	N/A	Tan, fine grained, poorly graded, SAND, loose, saturated
10.0	12.0	2.0	0.0	N/A	Same as above
12.0	13.0	1.0	0.0	N/A	Gray, fine grained, poorly graded, silty SAND, loose, saturated
13.0	15.0	2.0	0.0	N/A	Gray, fine grained, poorly graded, SAND with silt, loose, saturated
15.0	20.0	5.0	0.0	N/A	Same as above
20.0	25.0	5.0	0.0	N/A	Same as above
25.0	30.0	5.0	0.0	N/A	Same as above, but gray, fine grained, clayey SAND from 26.0' to 28.5'
30.0	32.0	2.0	0.0	N/A	Same as above
32.0	34.0	2.0	0.0	N/A	Alternating bands of gray, fine grained SAND and gray, fine grained, clayey SAND. Fine to medium to coarse grained SAND and rounded pebbles from 33.0' to 33.5'.
34.0	35.0	1.0	0.0	N/A	Tan/Gray, fine to medium to coarse grained, well graded, SAND, medium dense, sub-angular to sub-rounded grains and rounded quartz pebbles present, saturated
35.0	39.0	4.0	0.0	N/A	Same as above
39.0	40.0	1.0	0.0	N/A	Gray, fine to medium grained, SAND with alternating bands of gray, fine grained, clayey SAND, loose to medium dense, saturated
40.0	43.5	3.5	0.0	N/A	Gray, fine to medium grained, SAND with alternating bands of gray, fine to medium grained, clayey SAND, loose to medium dense, saturated

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-14 / MW-14D Project/No. GP08HAFS.H01B.DG0FI Page 2 of 2

Site Location: Hunter AAF (HAA-01) Drilling Started: 14:45 Drilling Completed: 17:20 (11/5/09)

Drilling Contractor: ARM Environmental Services, Inc. Driller: M. Carey Helper: J. Watson

Drilling Fluid Used: None Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) Sampling Interval: 1.0'-2.0', 3.0'-4.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 50.0 Feet Hole Diameter: 2.25 Coring Device: Hand-Auger (to 3'), MacroCore (3' - 45')

Prepared By: B. Wolf Hammer Weight _____ Hammer Drop _____ ins.

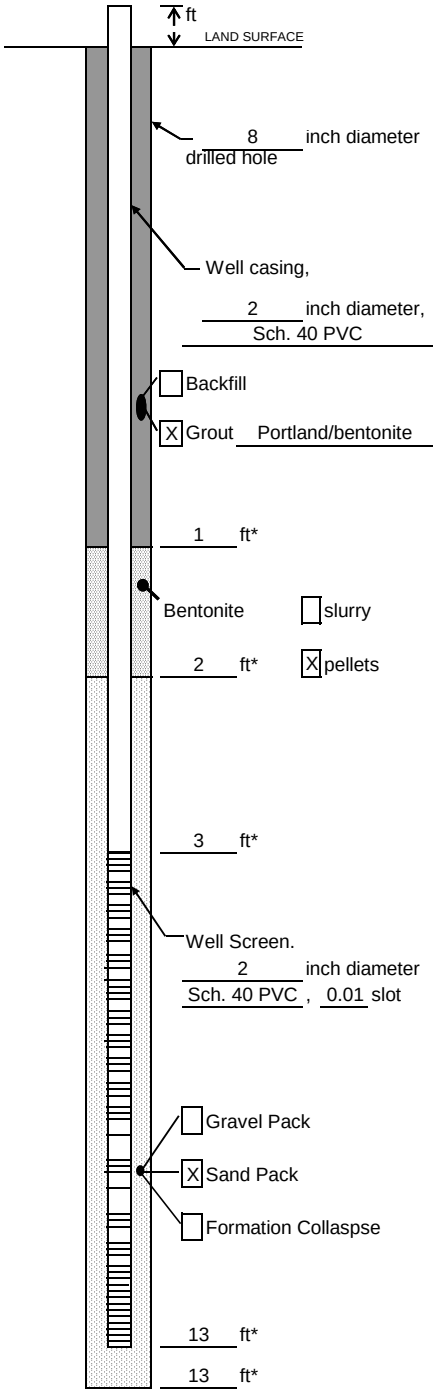
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	9:00	VOCs, Metals, Pesticides
3.0' - 4.0'	Grab	9:10	VOCs, Metals
			Samples collected from boring advanced at MW-14 on 11/6/09

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
43.5	44.0	0.5	0.0	N/A	Gray, CLAY with fine to medium grained sand, stiff, plastic
44.00	44.5	0.5	0.0	N/A	Gray, sandy CLAY, stiff, plastic, sand is fine to medium grained
					Geoprobe encounters refusal at 44.5'. Borehole completed to 50.0' using hollow-stem augers. Material recovered from bottom auger was a gray fine to medium grained, clayey SAND

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-14

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/6/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump with surge block

11/12/2009 to 11/13/2009

Fluid Loss During Drilling N/A gallons

Water Removed During Development 55 gallons

Static Depth to Water 6.78 feet below M.P.

Pumping Depth to Water 15.08 feet below M.P.

Pumping Duration 3 hours

Yield gpm Date

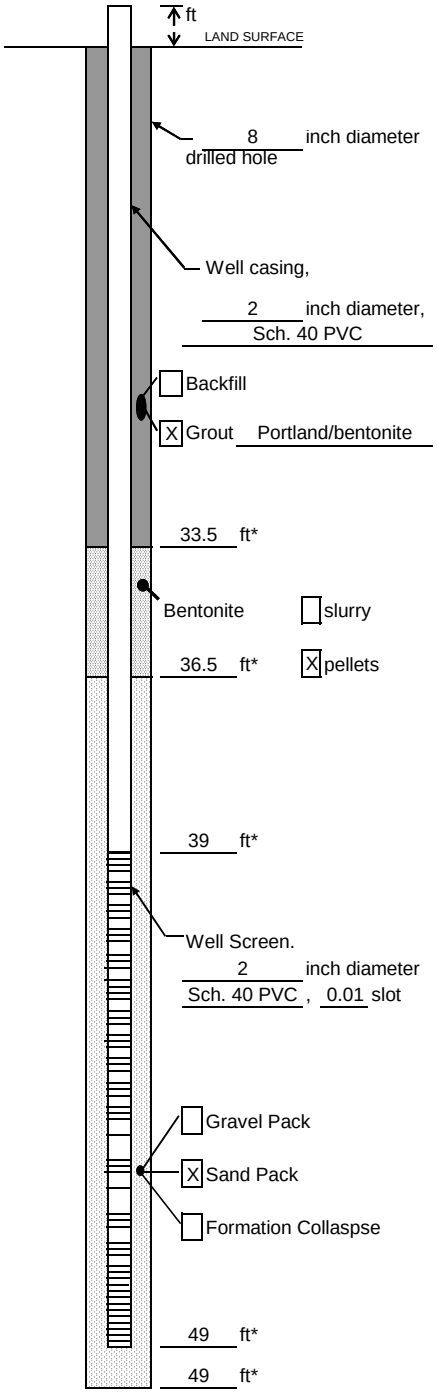
Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent during the 3 hour pumping duration and an accurate yield could not be calculated.

Prepared by B. Wolf

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-14D

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/6/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump 11/12/2009

Fluid Loss During Drilling N/A gallons

Water Removed During Development 85 gallons

Static Depth to Water 4.98 feet below M.P.

Pumping Depth to Water 52 feet below M.P.

Pumping Duration 1 hours

Yield 1.42 gpm Date 11/12/2009

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Borehole was drilled to 50.0', but bottom 1.0' collapsed, thus the well was set at 49.0'.

Prepared by B. Wolf

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-15 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 1

Site Location: Hunter AAF (HAA-01)
Drilling Started: 10:53
Drilling Completed: 11:22 (11/5/09)

Drilling Contractor: ARM Environmental Services, Inc.
Driller: M. Carey
Helper: J. Watson

Drilling Fluid Used: None
Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore)
Sampling Interval: 1.0'-2.0', 5.0'-6.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 15.0 Feet
Hole Diameter: 2.25
Coring Device: Hand-Auger (to 3'), MacroCore (3' - 15')

Prepared By: B. Wolf
Hammer Weight: _____
Hammer Drop: _____ ins.

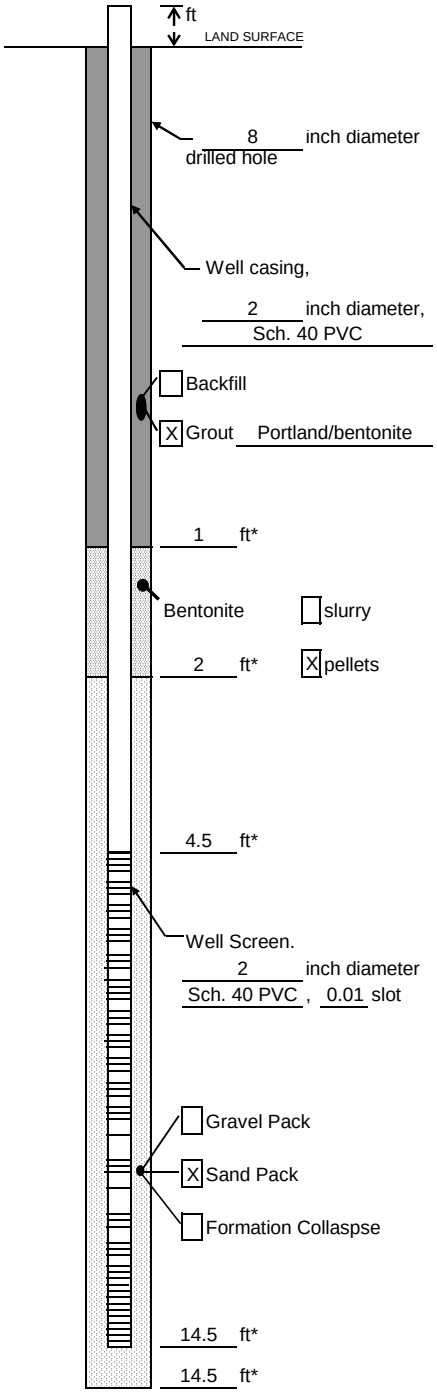
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	10:55	VOCs, Metals, Pesticides
5.0' - 6.0'	Grab	11:35	VOCs, Metals

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	1.5	1.5	0.0	N/A	Brown, fine grained, poorlly graded, silty SAND, loose
1.5	5.0	3.5	0.0	N/A	Same as above
5.0	5.5	0.5	0.0	N/A	Same as above
5.5	7.5	2.0	0.0	N/A	Dark brown/gray, fine grained, poorly graded, SAND with silt, loose
7.5	8.5	1.0	0.0	N/A	Dark brown, fine grained, poorly graded, SAND with silt, loose, wet
8.5	9.0	0.5	0.0	N/A	Dark brown, fine grained, poorly graded, silty SAND, medium dense, wet
9.0	10.0	1.0	0.0	N/A	Brown/tan, fine grained, poorly graded, SAND with silt, loose to medium dense, wet
10.0	13.5	3.5	0.0	N/A	Tan fine grained, poorly graded, SAND, loose, saturated
13.5	14.75	1.25	0.0	N/A	Tan/gray, fine grained, poorly graded, SAND with silt, loose, saturated
14.75	15.0	0.25	0.0	N/A	Gray, fine grained, poorly graded, silty SAND, loose, saturated

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-15

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/5/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump / peristaltic pump with surge block

11/12/2009 - 11/13/2009

Fluid Loss During Drilling N/A gallons

Water Removed During Development 55 gallons

Static Depth to Water 10.33 feet below M.P.

Pumping Depth to Water 16.95 feet below M.P.

Pumping Duration 5 hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent during the 5 hour pumping duration and an accurate yield could not be calculated.

Prepared by B. Wolf

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-16 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 1

Site Location: Hunter AAF (HAA-01) Drilling Started: 10:44 Drilling Completed: 11:38 (11/4/09)

Drilling Contractor: ARM Environmental Services, Inc. Driller: M. Carey Helper: J. Watson

Drilling Fluid Used: None Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) Sampling Interval: 1.0'-2.0', 10.0'-11.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 20.0 Feet Hole Diameter: 2.25 Coring Device: Hand-Auger (to 3'), MacroCore (3' - 20')

Prepared By: B. Wolf Hammer Weight _____ Hammer Drop _____ ins.

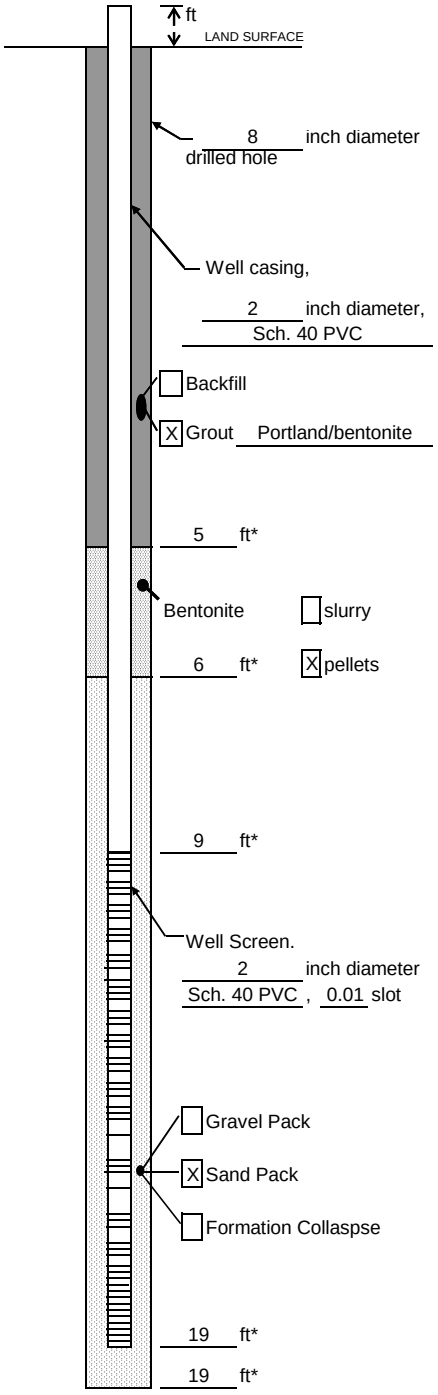
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	11:00	VOCs, Metals, Pesticides
10.0' - 11.0'	Grab	11:42	VOCs, Metals

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	6.5	6.5	0.0	N/A	Brown, fine grained, poorlly graded, SAND with silt, loose
6.5	8.5	2.0	0.0	N/A	Tan to brown, fine grained, poorly graded, SAND, loose
8.5	10.0	1.5	0.0	N/A	Tan, fine grained, poorly graded, SAND, loose
10.0	11.0	1.0	0.0	N/A	Same as above
11.0	12.0	1.0	0.0	N/A	Tan/brown, fine grained, poorly graded, silty SAND, medium dense, wet
12.0	14.5	2.5	0.0	N/A	Tan, fine grained, poorly graded, SAND with silt, medium dense, saturated
14.5	15.0	0.5	0.0	N/A	Tan, fine grained, poorly graded, SAND, medium dense, saturated
15.0	17.0	2.0	0.0	N/A	Same as above
17.0	19.0	2.0	0.0	N/A	Same as above, but slightly darker in color
19.0	19.25	0.25	0.0	N/A	Brown, fine grained, poorlly graded, SAND with silt, medium dense, saturated
19.25	19.5	0.25	0.0	N/A	Gray/brown, fine grained, sandy CLAY, stiff, plastic
19.5	20.0	0.5	0.0	N/A	Gray/brown, fine grained, poorly graded, SAND with silt, medium dense, saturated

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-16

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/4/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump / peristaltic pump

11/11/2009 to 11/12/2009

Fluid Loss During Drilling N/A gallons

Water Removed During Development 35 gallons

Static Depth to Water 15.55 feet below M.P.

Pumping Depth to Water 22 feet below M.P.

Pumping Duration 2.5 hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent during the 2.5 hour pumping duration and an accurate yield could not be calculated.

Prepared by B. Wolf

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel MW-17 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 1

Site Location: Hunter AAF (HAA-01) Drilling Started: 8:18 Drilling Completed: 8:45 (11/4/09)

Drilling Contractor: ARM Environmental Services, Inc. Driller: M. Carey Helper: J. Watson

Drilling Fluid Used: None Drilling Method: Hand-Auger, Direct Push (Geoprobe)

Length and Diameter of Coring Device: 1.5' x 3" (Hand-Auger), 5' x 2.25" (MacroCore) Sampling Interval: 1.0'-2.0', 6.0'-7.0' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 15.0 Feet Hole Diameter: 2.25 Coring Device: Hand-Auger (to 3'), MacroCore (3' - 20')

Prepared By: B. Wolf Hammer Weight _____ Hammer Drop _____ ins.

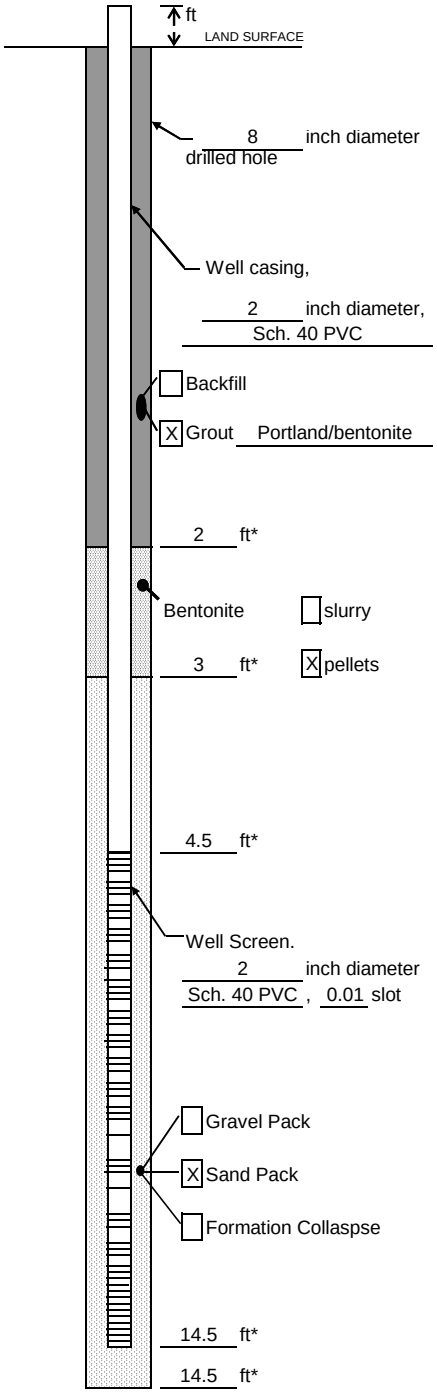
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis
1.0' - 2.0'	Grab	8:20	VOCs, Metals, Pesticides
6.0' - 7.0'	Grab	8:45	VOCs, Metals

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
0.0	3.0	3.0	0.0	N/A	Dark brown, fine grained, poorlly graded, SAND with silt, loose
3.0	5.0	2.0	0.0	N/A	Same as above
5.0	7.5	2.5	0.0	N/A	Same as above
7.5	8.0	0.5	0.2	N/A	Gray/tan, fine grained, poorly gaded, SAND with silt, loose, wet
8.0	9.0	1.0	0.0	N/A	Gray/tan, fine grained, poorly gaded, silty SAND, loose, wet
9.0	9.5	0.5	0.0	N/A	Gray, fine grained, poorly graded, silty SAND, loose, saturated
9.5	10.0	0.5	0.0	N/A	Gray, fine grained, clayey SAND, loose, slightly plastic, saturated
10.0	15.0	5.0	0.0	N/A	Gray, fine grained, poorly graded, silty SAND, loose, saturated

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-17

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/4/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump / peristaltic pump with surge block

11/11/2009 - 11/13/2009

Fluid Loss During Drilling N/A gallons

Water Removed During Development 55 gallons

Static Depth to Water 7.8 feet below M.P.

Pumping Depth to Water 16.68 feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks Well repeatedly went dry during development. Therefore, pumping was interittent and an accurate yield could not be calculated.

Prepared by B. Wolf

SOIL CORE / SAMPLING LOG

Boring/Wel MW-18 Project/No. GP08HAFS.H01B.DG0FI Page 1 of 2

Site Location: Hunter AAF (HAA-01) Drilling Started: 9:31 Drilling Completed: 14:57 (11/12/09)

Drilling Contractor: ARM Environmental Services, Inc. Driller: B. Ewing Helper: J. Watson

Drilling Fluid Used: None Drilling Method: Hollow-stem Auger

Length and Diameter of Coring Device: 2.0' x 2.0" Sampling Interval: _____ feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Total Depth Drilled: 66.0 Feet Hole Diameter: 8.0" Coring Device: Split Spoon Sampler

Prepared By: B. Wolf Hammer Weight: 180 lbs Hammer Drop: 36 ins.

Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
3.0	5.0	2.0	0.0	11,9,8,6	Brown, fine grained, poorlly graded, SAND with silt, loose, asphalt and concrete fragments present throughout core
7.0	9.0	2.0	0.0	8,6,1,3	7.0' - 7.5': Slough
					7.5' - 8.75': Tan, fine grained, poorly grade, SAND with silt, loose
					8.75' - 9.0': Dark brown, fine grained, poorly graded, silty SAND, medium dense, moist
12.0	14.0	2.0	0.0	6,4,17,13	12.0' - 13.5': Dark brown, fine grained, poorly graded, silty SAND, medium dense, saturated
17.0	19.0	2.0	0.0	4,3,3,10	17.0' - 18.5': Tan/gray mottled, fine grianed, poorly graded, silty SAND, medium dense, saturated
					18.5' - 19.0': Tan/gray, fine grained, poorly graded, SAND with silt, loose, saturated
22.0	24.0	0.0	0.0	9,9,5,12	No recovery
27.0	29.0	2.0	0.0	4,3,3,5	Gray, fine grained, poorly graded, SAND with silt, medium dense, saturated. Slightly more silt and clay between 27.5' and 28.0', few sub-rounded coarse grains near 29.0'.
32.0	34.0	1.25	0.0	2,1,3,3	Gray, fine grained, poorly graded, silty SAND, loose, saturated
37.0	39.0	2.0	0.0	5,4,4,13	37.0' - 38.0': Gray, sandy CLAY, soft, moderately plastic, saturated
					38.0' - 38.5': Gray, fine grained, poorly graded, SAND with silt, medium dense
					38.5' - 39.0': Gray, fine to medium to coarse grained, well graded, silty SAND, medium dense, coarse grains are rounded to sub-rounded quartz, sub-rounded quartz pebbles present, saturated
42.0	44.0	2.0		8,15,15,12	42.0' - 43.0': Tan/gray, fine grained, poorly graded, SAND with silt, medium dense, saturated
					43.0' - 43.25': Gray, fine grained, clayey SAND, loose, plastic

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Wel: MW-18 | Project/No.: GP08HAFS.H01B.DG0FI | Page: 2 of 2

Site Location: Hunter AAF (HAA-01) | Drilling Started: 9:31 | Drilling Completed: 14:57 (11/12/09)

Drilling Contractor: ARM Environmental Services, Inc. | Driller: B. Ewing | Helper: J. Watson

Drilling Fluid Used: None | Drilling Method: Hollow-stem Auger

Length and Diameter of Coring Device: 2.0' x 2.0" | Sampling Interval: _____ feet

Land-Surface Elev.: _____ feet ☐ Surveyed ☐ Estimated | Datum: _____

Total Depth Drilled: 66.0 Feet | Hole Diameter: 8.0" | Coring Device: Split Spoon Sampler

Prepared By: B. Wolf | Hammer Weight: 180 lbs | Hammer Drop: 36 ins.

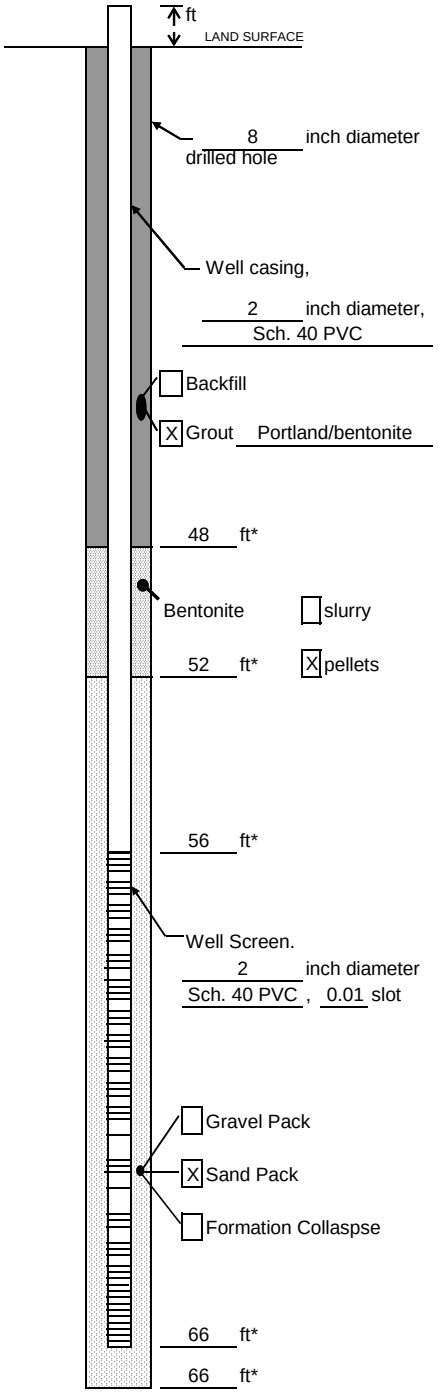
Sampling Data:

Depth	Grab/Composite	Time	Laboratory Analysis

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Core Recovery (Feet)	OVM Reading (ppm)	Blow Counts per 6 Inches	Sample/Core Description Soil type, %, Grain Size, Angularity, Grading, Consistency, Plasticity, Color, etc.
					43.25' - 43.5': Tan/gray, fine grained, SAND with silt, rounded quartz pebbles present
					43.5' - 44.0': Light gray, fine to medium to coarse grained, well graded, SAND, medium dense, greenish clay stringers present, coarser grains are rounded to sub-rounded
47.0	49.0	2.0	0.0	6,3,5,10	47.0' - 47.75': Tan/gray, fine grained, poorly graded, silty SAND, medium dense, saturated
					47.75' - 48.25': Gray, sandy CLAY, soft, plastic, saturated
17.0	19.0	2.0	0.0	4,3,3,10	48.25' - 48.5': Tan/orange, fine to medium to coarse grained, well graded, clayey SAND, dense, saturated, rounded pebbles present
					48.5' - 49.0': Gray, fine to medium to coarse grained, well graded, silty SAND, medim dense, saturated
52.0	54.0	2.0	0.0	7,10,22,27	52.0' - 52.75': Gray, fine grained, poorly graded, SAND with silt, medium dense, saturated
					52.75' - 53.0': Gray, sandy CLAY, soft, plastic, saturated
					53.0' - 54.0': Gray, fine to medium to coarse grained, well graded, SAND with silt, medium dense, saturated
57.0	59.0	2.0	0.0	9,12,40,50	Gray, fine grained, moderately poorly graded, SAND, dense, few sub-angular to sub-rounded medium and coarse grains present, saturated
62.0	64.0	2.0	0.0	11,14,20,30	Same as above
64.0	66.0				Soils observed on two bottom flights of hollow-stem augers (advanced to 66.0') consisted of gray, sandy (fine grained) CLAY, soft, plastic, with rounded quartz pebbles present

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01B.DG0FI Well MW-18

Town/City Hunter Army Airfield (HAA-01)

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/12/2009

Drilling Method Hollow-Stem Auger

Drilling Contractor ARM Environmental Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump 11/13/2009

Fluid Loss During Drilling N/A gallons

Water Removed During Development 50 gallons

Static Depth to Water 11.72 feet below M.P.

Pumping Depth to Water 20.08 feet below M.P.

Pumping Duration 1 hours

Yield 0.833 gpm Date 11/13/2009

Specific Capacity gpm/ft

Well Purpose Groundwater Monitoring

Remarks

Prepared by B. Wolf

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA COI SOE-MW-08
Date:	12/16/09	Sampled By:	A. PAGNON		
Sampling Time:	1520	Recorded By:	A. PAGNON		
Weather:	50s SUNNY	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	1.5"	Screen Interval: From:	8.10 To: 18.10
Total Depth:	18.10	Pump Intake Setting:	~13 Ft BTOC
Depth to Water:	3.57	Volumes to be Purged:	N/A Leave Empty
Water Column:	14.53	Total Volume Purged:	~12000 mL
Gallons/Foot:	0.16	Pump On:	1340 Off: 1520
Gallons in Well:	2.33		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1345	5	~150	~750	4.12	67.7	7.94	951	17.64	123.0	9.60	-
1350	10	~150	~1500	4.23	65.3	2.99	958	17.64	121.4	6.91	-
1355	15	~150	~2250	4.26	56.7	2.77	957	17.82	131.8	4.92	-
1400	20	~150	~3000	4.26	58.5	2.45	951	17.95	147.4	3.71	-
1405	25	~150	~3750	4.26	49.2	1.87	927	17.96	183.9	4.55	-
1410	30	~150	~4500	4.26	41.2	2.17	920	17.74	173.1	5.16	-
1415	35	~150	~5250	4.26	40.5	2.10	914	17.75	177.1	4.77	-
1420	40	~150	~6000	4.26	32.9	1.71	876	17.70	199.6	3.69	-
1425	45	~150	~6750	4.26	34.4	1.72	892	17.82	199.7	5.78	-
1430	50	~150	~7500	4.26	29.0	1.70	872	17.87	202.4	5.24	-
1435	55	~150	~8250	4.26	27.4	1.57	841	17.91	208.5	4.81	-
1440	60	~150	~9000	4.26	25.1	2.07	868	17.94	171.5	5.02	-
1445	65	~150	~9750	4.26	20.6	2.17	872	17.89	170.2	5.36	-
1450	70	~150	~10500	4.26	23.4	2.11	868	17.74	167.6	5.08	-
1455	75	~150	~11250	4.26	21.8	1.83	870	17.82	187.9	4.93	-

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLEAR	Turbidity(qualitative):	CLEAR + SMALL WHITE PARTICLES
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS	Preservative
PESTICIDES	1 L AMBER (2)	-
VOCs	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3
-	-	-

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

HAA-01

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	COE-MW-08
Date:	12/16/2009	Sampled By:	A. PAGNON		
Sampling Time:		Recorded By:	A. PAGNON		
Weather:	50s CLOUDY	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	SAME	SAME

Purging Information

Casing Material:
Casing Diameter:
Total Depth:
Depth to Water:
Water Column:
Gallons/Foot:
Gallons in Well:

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer Peristaltic
Screen Interval: From: To:
Pump Intake Setting:
Volumes to be Purged:
Total Volume Purged:
Pump On: Off:

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1500	80	~150	~9000	4.26	21.8	2.09	872	18.35	167.8	5.05	—
1505	85	~150	~9750	4.26	17.9	2.43	876	18.69	149.3	5.31	—
1510	90	~150	~10500	4.26	9.61	2.75	852	18.88	119.1	5.62	—
1515	95	~150	~11250	4.26	8.63	2.81	849	18.89	108.2	5.45	—
1520	100	~150	~12000	4.26	8.62	2.80	844	18.90	105.5	5.44	—
							12/16/09				

Observations During Sampling

Well Condition: SAME
Color:
Odor:

Purge Water Disposal: SAME
Turbidity(qualitative):
Other (OVA, HNU,etc.):

Constituents Sampled	From Lab	Container Description: ARCADIS	Preservative
SAME	SAME		

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HAA01-MW-9
Date:	12-16-09	Sampled By:	Ryan Kontos		
Sampling Time:	1650	Recorded By:	Ryan Kontos		
Weather:	Clear ~60°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9397 Comotte 2025/R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	7 To: 17
Total Depth:	17.0	Pump Intake Setting:	Middle of Screen 12'
Depth to Water:	10.78	Volumes to be Purged:	Low Flow
Water Column:	6.22	Total Volume Purged:	~1.5gal
Gallons/Foot:	0.16	Pump On:	1550 Off: 1630
Gallons in Well:	0.99		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1555	5	150ml	~750ml	10.81	8.94	5.09	303	17.50	96.4	0.91	
1600	10	↓	↓	10.82	7.11	5.11	305	17.97	93.6	0.99	
1605	15			10.82	5.48	5.08	312	18.28	93.8	0.83	
1610	20			10.82	5.11	5.06	317	18.29	90.0	0.62	
1615	25			10.82	4.89	5.06	320	18.41	90.3	0.59	
1620	30			10.82	4.68	5.07	321	18.38	89.5	0.51	
1625	35			10.82	4.38	5.06	325	18.41	84.5	0.38	
1630	40	↓	↓	10.82	4.14	5.06	327	18.40	81.9	0.45	

Observations During Sampling

Well Condition:	PVC	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTU's
Odor:	Slight	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab	ARCADIS	Preservative
VOC 8260	3 40ml	CG	HCL
Metals 6010	1 500ml	PL	HNO3
Pesticides	2 1L	AG	—

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	COE-MW-2
Date:	12-16-09	Sampled By:	Ryan Kontos		
Sampling Time:	1525	Recorded By:	Ryan Kontos		
Weather:	Clear ~60°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9397 Lamotte 2020/R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	~~2~~ 1.5	Screen Interval: From:	14.9 To: 19.9
Total Depth:	19.9	Pump Intake Setting:	Middle of screen ~ 17.5
Depth to Water:	11.18	Volumes to be Purged:	Low Flow
Water Column:	8.72	Total Volume Purged:	~1.87 gal
Gallons/Foot:	0.12	Pump On:	1415 Off: 1505
Gallons in Well:	1.04		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1420	5	150ml	750ml	11.69	10.40	5.48	141	18.56	51.4	0.66	
1425	10	150ml	750ml	12.41	9.66	5.44	141	18.57	37.8	0.75	
1430	15	1		12.65	10.59	5.38	141	18.54	12.2	0.58	
1435	20			12.68	10.15	5.38	140	18.51	-1.3	0.33	
1440	25			12.70	6.84	5.36	138	18.48	-9.4	0.36	
1445	30			12.71	6.01	5.36	139	18.52	-12.6	0.26	
1450	35			12.71	5.45	5.37	138	18.55	-15.9	0.29	
1455	40			12.72	3.97	5.37	139	18.57	-21.2	0.30	
1500	45			12.72	3.77	5.37	139	18.62	-23.3	0.27	
1505	50	↓	↓	12.72	4.01	5.37	140	18.64	-26.8	0.26	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTU's
Odor:	Slight	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab	ARCADIS	Preservative
VOC 8260	3	40ml CG	HCL
MCtals 6010	1	500cc PL	HNO3
Pesticides	2	1L AG	

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	COE-MW-3
Date:	12-16-09	Sampled By:	Ryan Kontos		
Sampling Time:	1210	Recorded By:	Ryan Kontos		
Weather:	Clear ~55	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9397 Lamotte 2020/R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	1.5	Screen Interval: From:	15 To: 20
Total Depth:	20	Pump Intake Setting:	Middle of Screen ~17.5'
Depth to Water:	11.07	Volumes to be Purged:	Low Flow
Water Column:	8.93	Total Volume Purged:	1.68
Gallons/Foot:	0.12	Pump On:	1105 Off: 1150
Gallons in Well:	1.07		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1110	5	150ml	750ml	11.99	5.08	5.37	282	19.36	20.6	0.80	
1115	10			13.06	4.81	5.37	286	19.25	16.7	0.71	
1120	15			13.91	4.55	5.36	290	19.51	9.01	0.60	
1125	20			14.10	3.98	5.37	290	19.46	3.6	0.38	
1130	25			14.28	3.51	5.36	291	19.40	1.9	0.33	
1135	30			14.31	3.57	5.36	291	19.36	-0.4	0.26	
1140	35			14.32	3.55	5.36	291	19.33	-3.8	0.23	
1145	40			14.32	3.21	5.36	293	19.31	-8.8	0.25	
1150	45	↓	↓	14.32	3.15	5.36	293	19.29	-10.5	0.26	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTUs
Odor:	None	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab	Container Description ARCADIS	Preservative
VOC 8260	3	40ml CG	HCL
Metals 6010	1	500cc PL	HNO3
Pesticides	2	1L AG	—

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	COE-MW-1
Date:	12-16-09	Sampled By:	RyKontos		
Sampling Time:	1045	Recorded By:	Ryan Kontos		
Weather:	Clear	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9897 Lamotte 2020/R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	1.5	Screen Interval: From:	15 To: 20
Total Depth:	20	Pump Intake Setting:	Middle of screen ~ 12.5'
Depth to Water:	12.58	Volumes to be Purged:	Low Flow
Water Column:	7.42	Total Volume Purged:	~1.5 gal
Gallons/Foot:	0.12	Pump On:	0945 Off: 1025
Gallons in Well:	0.89		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0950	5	150ml	750ml	13.01	15.6	5.19	198	18.42	-31.7	1.01	
0955	10	↓	↓	13.28	12.5	5.17	190	18.53	-40.6	0.91	
~~1000~~	15			13.40	9.72	5.16	191	18.60	-61.1	0.80	
1005	20			13.41	4.51	5.18	193	18.61	-70.0	0.52	
1010	25			13.41	4.02	5.18	192	18.78	-77.1	0.60	
1015	30			13.41	3.89	5.19	192	18.91	-78.2	0.49	
1020	35			13.41	3.51	5.18	192	18.99	-80.1	0.44	
1025	40	↓	↓	13.41	3.69	5.18	192	19.05	-81.2	0.31	
~~1030~~											

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTUs
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab	ARCADIS	Preservative
VOC 8260	3 40ml	Clo	HCL
Metals 6010	1 500cc	PL	HNO3
Pesticides	2 1L	AG	—

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HMW-14R
Date:	12-16-09	Sampled By:	Ryan Kontos		
Sampling Time:	0920 0935	Recorded By:	Ryan Kontos		
Weather:	Clear ~50°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9397 Lamotte 2020 R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	9.2 To: 18.9
Total Depth:	18.9	Pump Intake Setting:	Middle of screen 14'
Depth to Water:	11.42	Volumes to be Purged:	Low Flow
Water Column:	7.48	Total Volume Purged:	~2.0gal
Gallons/Foot:	0.16	Pump On:	0820 Off: 0915
Gallons in Well:	1.19		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or mL)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0825	5	150ml	750ml	11.666	10.27	4.59	278	18.10	284.0	1.13	
0830	10	150ml	750ml	11.67	6.15	4.70	255	18.55	250.2	0.88	
0835	15	150ml	750ml	11.67	4.75	4.78	247	18.93	232.1	0.71	
0840	20	150ml	750ml	11.68	4.29	4.89	246	19.19	215.0	0.67	
0845	25	150ml	750ml	11.68	3.18	5.18	280	19.46	126.9	0.70	
0850	30	150ml	750ml	11.68	3.45	5.36	291	19.83	94.1	0.54	
0855	35	150ml	750ml	11.68	24.5	5.09	243	19.77	103.1	0.61	
0900	40	150ml	750ml	11.68	16.2	5.10	240	19.81	98.2	0.44	
0905	45	150ml	750ml	11.68	5.10	5.08	230	19.66	76.1	0.49	
0910	50	150ml	750ml	11.68	4.69	5.08	227	19.59	76.8	0.41	
0915	55	150ml	750ml	11.68	3.91	5.07	224	19.53	77.2	0.39	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTUs
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab	ARCADIS	Preservative
VOC 8260	3 40ml	AG	HCl
Metals 6010	1 500ml	PL	HNO3
Pesticides	2 1L	AG	—

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01-MW-18
Date:	12-16-09	Sampled By:	Ryan Kontos		
Sampling Time:	1348	Recorded By:	Ryan Kontos		
Weather:	Clear ~60°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556 / R9397 Lanotte 2006 R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	56 To: 66
Total Depth:	66	Pump Intake Setting:	Middle of Screen Int
Depth to Water:	8.45	Volumes to be Purged:	Low Flow
Water Column:	57.55	Total Volume Purged:	1.5 gal
Gallons/Foot:	0.16	Pump On:	1230 Off: 1315
Gallons in Well:	9.20		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1235	5	150ml	750ml	8.64	7.21	6.47	245	19.39	-4.5	0.71	
1240	10	150ml	750ml	8.68	4.43	6.50	244	19.36	-13.4	0.58	
1245	15	↓	↓	8.70	3.11	6.49	242	19.40	-15.4	0.50	
1250	20			8.71	2.95	6.48	241	19.39	-17.7	0.46	
1255	25			8.71	3.00	6.47	238	19.43	-19.5	0.41	
1300	30			8.72	2.83	6.44	235	19.42	-22.6	0.38	
1305	35			8.72	2.91	6.44	235	19.34	-24.0	0.33	
1310	40			8.72	2.95	6.43	234	19.33	-23.1	0.26	
1315	45	↓	↓	8.72	2.76	6.43	234	19.33	-22.7	0.25	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTU's
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab	ARCADIS	Preservative
VOC 8260	3 40ml	CG	HCL
Metals 6010	1 500cc	PL	HNO3
Pesticides	2 1L	AG	—
SVOC's 8270	2 1L	AG	—

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01 COC-MW7
Date:	12/16/09	Sampled By:	A. PAGNON		
Sampling Time:	1250	Recorded By:	A. PAGNON		
Weather:	50s Sunny	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible	Centrifugal	Bladder / Bailer / Peristaltic
Casing Diameter:	1.5"	Screen Interval: From:	7.90	To:	17.90
Total Depth:	17.90	Pump Intake Setting:	~13 Ft BTOC		
Depth to Water:	3.43	Volumes to be Purged:	N/A Low Flow		
Water Column:	14.47	Total Volume Purged:	~9000	mL	
Gallons/Foot:	0.16	Pump On:	1150	Off:	1250
Gallons in Well:	2.32				

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1155	5	~150	~750	3.97	60.7	4.18	277	18.03	76.7	40.12	-
1200	10	~150	~1500	4.09	51.3	4.01	281	18.28	85.2	30.00	-
1205	15	~150	~2250	4.09	48.7	4.45	228	18.50	68.6	31.93	-
1210	20	~150	~3000	4.09	46.1	4.47	229	18.64	59.8	23.40	-
1215	25	~150	~3750	4.09	46.0	4.48	230	18.75	53.8	19.80	-
1220	30	~150	~4500	4.09	39.5	4.47	226	18.81	49.6	20.76	-
1225	35	~150	~5250	4.09	30.1	4.45	225	18.80	48.5	17.76	-
1230	40	~150	~6000	4.09	24.9	4.44	222	18.81	45.4	15.58	-
1235	45	~150	~6750	4.09	16.2	4.46	221	18.71	43.4	15.05	-
1240	50	~150	~7500	4.09	15.3	4.40	212	18.66	42.3	14.18	-
1245	55	~150	~8250	4.09	12.1	4.41	212	18.64	41.4	14.27	-
1250	60	~150	~9000	4.09	9.7	4.41	213	18.59	40.0	14.20	-
							12/16/09				

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLEAR	Turbidity(qualitative):	CLEAR - SMALL WHITE PARTICLES
Odor:	None	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS —	Preservative
PESTICIDES	1 L AMBER (2)	—
VOCs	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3
	—	—

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01 MW-14
Date:	12/16/09	Sampled By:	A. PAGNON		
Sampling Time:	1125	Recorded By:	A. PAGNON		
Weather:	50s SUNNY	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07M100507 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	4.5 To: 14.5 Ft BTOC
Total Depth:	14.5	Pump Intake Setting:	12 Ft BTOC
Depth to Water:	4.49	Volumes to be Purged:	N/A Low Flow
Water Column:	10.01	Total Volume Purged:	~22000 mL
Gallons/Foot:	0.16	Pump On:	0825 Off: 1130
Gallons in Well:	1.6		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged mL	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0830	5	150	750	4.71	258	5.01	261	17.06	31.9	1.46	
0835	10	150	1500	4.72	329	5.02	257	17.15	24.9	1.20	
0840	15	150	2250	4.74	290	5.04	249	17.18	22.1	1.08	
0845	20	150	3000	4.76	252	5.05	250	17.24	18.8	0.96	
0850	25	150	3750	4.78	240	5.06	249	17.34	15.9	0.83	
0855	30	150	4500	4.78	209	5.23	250	17.26	10.4	0.70	
0900	35	150	5250	4.78	163	5.11	251	17.15	6.3	0.69	
0905	40	150	6000	4.78	132	5.15	249	17.14	-1.0	0.74	
0910	45	150	6750	4.78	115	5.10	250	17.11	-6.1	0.81	
0915	50	150	7500	4.78	115	5.06	251	17.12	-6.5	0.86	
0920	55	150	8250	4.78	101.6	5.05	251	17.14	-7.8	0.77	
0925	60	150	9000	4.78	91.5	5.05	252	17.18	-11.5	0.68	
0930	65	150	9750	4.78	89.3	5.05	253	17.19	-13.9	0.64	
0935	70	150	10500	4.78	77.1	5.08	249	17.06	-16.2	1.20	
0940	75	150	11250	4.78	73.1	5.06	250	17.28	-18.0	0.44	

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	BROWN	Turbidity(qualitative):	BROWN TO LIGHT BROWN
Odor:	STRONG	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab PHASE X ARCADIS	Preservative
~~VOCs~~ PESTICIDES	1 L AMBER (2)	—
VOCs	40 ml VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO3

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01 MW-14
Date:	12/16/09	Sampled By:	A. PAGNON		
Sampling Time:	1125	Recorded By:	A. PAGNON		
Weather:	50s SUNNY	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:		

Purging Information

Casing Material:
Casing Diameter:
Total Depth:
Depth to Water:
Water Column:
Gallons/Foot:
Gallons in Well:

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer Peristaltic
Screen Interval: From: To:
Pump Intake Setting:
Volumes to be Purged:
Total Volume Purged:
Pump On: Off:

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or mL/min)	Volume Purged mL	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen mg/L	Comments
0945	80	150	12000	4.78	73.6	5.04	249	17.27	-20.1	0.33	—
0950	85	150	12750	4.78	57.4	5.04	250	17.31	-21.9	0.31	—
0955	90	150	13500	4.78	54.6	5.04	249	17.28	-25.3	0.32	—
1000	95	150	14250	4.78	46.4	5.03	250	17.19	-26.2	0.29	—
1005	100	150	15000	4.78	41.3	5.04	252	17.13	-26.1	0.26	—
1010	105	150	15750	4.78	40.9	5.03	250	17.07	-30.1	0.26	—
1015	110	150	16500	4.78	40.9	5.04	250	17.09	-31.2	0.27	—
1020	115	150	17250	4.78	37.4	5.02	246	16.99	-33.0	0.29	—
1025	120	150	18000	4.78	36.1	5.02	246	16.98	-33.5	0.27	—
1030	125	150	18750	4.78	34.9	5.00	248	16.96	-35.3	0.22	—
1035	130	150	19500	4.78	31.3	5.00	246	16.70	-37.5	0.22	—
1040	135	150	20250	4.78	27.2	5.00	245	16.94	-37.4	0.22	—
1045	140	150	21000	4.78	23.4	4.98	245	17.14	-38.5	0.20	—
1050	145	150	21750	4.78	21.5	4.98	244	17.28	-41.5	0.38	
1055	150	150	22500	4.78	20.6	4.98	245	17.26	-44.7	0.38	

Observations During Sampling

Well Condition: SAME
Color:
Odor:

Purge Water Disposal:
Turbidity(qualitative):
Other (OVA, HNU,etc.): SAME

Constituents Sampled	Container Description: From Lab	ARCADIS	Preservative

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HAA-01 HW-14
Date:	12/16/09	Sampled By:	A. Pagnow		
Sampling Time:	1125	Recorded By:	A. Pagnow		
Weather:	50s. Sunny	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:		

Purging Information

Casing Material:
Casing Diameter:
Total Depth:
Depth to Water:
Water Column:
Gallons/Foot:
Gallons in Well:

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer Peristaltic
Screen Interval: From: To:
Pump Intake Setting:
Volumes to be Purged:
Total Volume Purged:
Pump On: Off:

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1105	160	~150	24000	4.78	18.1	4.96	246	17.26	-47.1	0.21	-
1115	170	~150	25500	4.78	15.8	4.96	243	17.23	-48.6	0.17	"
1125	180	~150	27000	4.78	9.73	4.96	242	17.27	-50.1	0.16	-

12/16/09

Observations During Sampling

Well Condition:
Color:
Odor:

Purge Water Disposal:
Turbidity(qualitative):
Other (OVA, HNU,etc.):

Constituents Sampled	Container Description: From Lab	Container Description: ARCADIS	Preservative

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01 MW-1HD
Date:	12/16/09	Sampled By:	A. PAGNON		
Sampling Time:	0905	Recorded By:	A. PAGNON		
Weather:	50s SUNNY	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2	Screen Interval: From:	~42.3 To: 52.3 Ft BTOC
Total Depth:	52.3	Pump Intake Setting:	~47 Ft BTOC
Depth to Water:	3.09	Volumes to be Purged:	N/A Low Flow
Water Column:	49.21	Total Volume Purged:	~6750 mL
Gallons/Foot:	0.16	Pump On:	0820 Off:
Gallons in Well:	7.87		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (umhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0825	5	~150	~750	3.11	44.9	5.96	325	15.74	62.5	60.03	
0830	10	~150	~1500	3.11	22.9	5.99	292	16.46	45.8	42.35	
0835	15	~150	2250	3.11	13.8	6.01	290	16.75	41.1	36.88	
0840	20	~150	3000	3.11	6.95	6.01	289	16.86	40.2	35.08	
0845	25	~150	3750	3.11	6.74	6.01	288	16.99	38.8	29.93	
0850	30	~150	4500	3.11	4.26	6.01	288	17.03	36.9	27.31	
0855	35	~150	5250	3.11	2.36	6.00	288	17.05	35.9	24.37	
0900	40	~150	6000	3.11	Ø	5.97	287	17.10	35.7	25.08	
0905	45	~150	6750	3.11	Ø	5.99	287	17.08	35.7	23.10	
							12/16/09				

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLEAR	Turbidity(qualitative):	CLEAR
Odor:	SLIGHT	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS —	Preservative
~~METALS~~ ~~PESTICIDES~~	1 L AMBER (2)	—
VOCs	40 mL VIAL (3)	HCl
METALS	250 mL PLASTIC (1)	HNO3
~	—	~

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01 MW-13
Date:	12/16/09	Sampled By:	A. PAGANO		
Sampling Time:	1655	Recorded By:	A. PAGANO		
Weather:	50s SUNNY	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one) Submersible Centrifugal Bladder Bailer Peristaltic	
Casing Diameter:	2"	Screen Interval: From:	5 To: 15.02
Total Depth:	15.02	Pump Intake Setting:	~10 ft BTOC
Depth to Water:	2.32	Volumes to be Purged:	N/A Low Flow
Water Column:	13.30	Total Volume Purged:	~8250 mL
Gallons/Foot:	0.16	Pump On:	1600 Off: 1700
Gallons in Well:	2.13		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1605	5	150	750	2.75	1.84	2.51	584	16.44	129.1	12.54	—
1610	10	150	1500	2.86	Ø	2.63	584	16.82	123.4	12.23	—
1615	15	150	2250	2.90	Ø	2.62	573	17.39	117.8	13.38	—
1620	20	150	3000	2.93	Ø	2.56	563	17.55	113.1	13.60	—
1625	25	150	3750	2.95	Ø	2.59	557	17.64	108.2	13.74	—
1630	30	150	4500	2.95	Ø	2.62	551	17.68	104.0	14.29	—
1635	35	150	5250	2.95	Ø	2.58	547	17.70	101.3	15.86	—
1640	40	150	6000	2.95	Ø	2.67	545	17.71	97.0	17.80	—
1645	45	150	6750	2.95	Ø	2.61	541	17.73	91.0	23.70	—
1650	50	150	7500	2.95	Ø	2.65	541	17.80	86.1	27.81	—
1655	55	150	8250	2.95	Ø	2.61	541	17.79	85.8	26.44	—

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLEAR	Turbidity(qualitative):	CLEAR
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS	Preservative
PESTICIDES	1 L AMBER (2)	—
VOC	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	COE-MW-4
Date:	12-17-09	Sampled By:	Ryan Kontos		
Sampling Time:	1355	Recorded By:	Ryan Kontos		
Weather:	Clear ~60°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	151556 R9397 Combo HC 2029/R9157

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	Ø 1.5	Screen Interval: From:	10 To: 15
Total Depth:	15	Pump Intake Setting:	Middle of Screen 12.5'
Depth to Water:	3.27	Volumes to be Purged:	Low Flow
Water Column:	11.73	Total Volume Purged:	1.87
Gallons/Foot:	0.12	Pump On:	1245 Off: 1335
Gallons in Well:	1.40		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml/)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1250	5	150ml	750ml	3.66	12.2	5.78	96	17.99	60.6	1.54	
1255	10	↓	↓	3.72	11.7	5.76	96	18.05	48.1	1.18	
1300	15			3.77	8.49	5.75	97	18.10	23.8	0.93	
1305	20			3.80	5.30	5.75	98	18.25	10.3	0.50	
1310	25			3.81	3.97	5.74	98	18.32	5.6	0.38	
1315	30			3.81	2.79	5.74	99	18.41	-1.8	0.35	
1320	35			3.82	2.58	5.74	99	18.29	-7.6	0.25	
1325	40			3.82	2.69	5.74	100	18.21	-13.0	0.27	
1330	45			3.82	2.71	5.73	100	18.14	-19.5	0.19	
1335	50	↓	↓	3.82	2.02	5.72	101	18.09	-21.2	0.16	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTUs
Odor:	Slight	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab	ARCADIS	Preservative
VOC 8260	3 40ml	CG	HCL
Metals 6010	1 500ml	PL	HNO3
Pesticides	2 1L	AG	—

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01 CDS-MW-05
Date:	12/17/09	Sampled By:	A. PAGNON		
Sampling Time:	1105	Recorded By:	A. PAGNON		
Weather:	50s SUNNY	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Baller Peristaltic
Casing Diameter:	1.5"	Screen Interval: From:	~7.5 To: 17.45
Total Depth:	17.45	Pump Intake Setting:	~12 Ft BTOC
Depth to Water:	2.52	Volumes to be Purged:	N/A Low Flow
Water Column:	14.93	Total Volume Purged:	~9000 mL
Gallons/Foot:	0.16	Pump On:	1005 Off: 1105
Gallons in Well:	2.39		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1010	5	150	750	3.50	8.94	5.71	230	16.79	67.5	0.98	-
1015	10	150	1500	3.65	4.71	5.76	227	17.57	45.5	0.61	-
1020	15	150	7250	3.65	7.73	5.80	222	17.86	33.7	0.45	-
1025	20	150	3000	3.65	1.73	5.84	220	17.96	26.0	0.35	-
1030	25	150	3750	3.65	Ø	5.88	216	18.01	18.4	0.32	-
1035	30	150	4500	3.65	Ø	5.89	215	18.05	11.5	0.31	-
1040	35	150	5250	3.65	Ø	5.92	214	18.09	5.2	0.30	-
1045	40	150	6000	3.65	Ø	5.94	212	18.16	1.4	0.29	-
1050	45	150	6750	3.65	Ø	5.98	211	18.26	-0.8	0.27	-
1055	50	150	7500	3.65	Ø	5.99	211	18.26	-3.1	0.24	-
1100	55	150	8250	3.65	Ø	6.02	211	18.26	-7.0	0.23	-
1105	60	150	9000	3.65	Ø	5.99	211	18.24	-5.6	0.23	-
							12/17/09				

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLEAR	Turbidity(qualitative):	CLEAR
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS	Preservative
PESTICIDES	1 L AMBER (2)	-
VOCs	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3
		-

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

HAA-01

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	COE-MW-06
Date:	12/17/2009	Sampled By:	A. TAGNON		
Sampling Time:	0930	Recorded By:	A. TAGNON		
Weather:	50s Cloudy	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-107552

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	1.5"	Screen Interval: From:	8 To: 18.05 Ft BTOC
Total Depth:	~18.05	Pump Intake Setting:	~13 Ft BTOC
Depth to Water:	3.22	Volumes to be Purged:	N/A Low Flow
Water Column:	14.83	Total Volume Purged:	~8250 mL
Gallons/Foot:	0.16	Pump On:	0835 Off: 0930
Gallons in Well:	2.37		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged (mL)	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0840	5	~150	750	4.25	6.67	5.06	217	15.68	182.6	1.34	-
0845	10	150	1500	4.19	Ø	5.39	198	16.22	121.0	1.01	-
0850	15	150	2250	4.19	Ø	5.52	188	16.53	54.7	0.93	-
0855	20	150	3000	4.22	Ø	5.55	187	16.70	42.5	0.73	-
0900	25	150	3750	4.22	Ø	5.59	188	16.82	28.0	0.79	-
0905	30	150	4500	4.22	Ø	5.59	188	16.76	19.5	0.62	-
0910	35	150	5250	4.22	Ø	5.60	188	16.11	15.6	0.68	-
0915	40	150	6000	4.22	Ø	5.60	190	16.32	16.4	0.55	-
0920	45	150	6750	4.22	Ø	5.60	192	16.30	15.4	0.46	-
0925	50	150	7500	4.22	Ø	5.60	194	16.26	10.3	0.56	-
0930	55	150	8250	4.22	Ø	5.60	194	16.24	11.1	0.57	-
							12/17/2009				

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	CLEAR	Turbidity(qualitative):	White Particles
Odor:	None	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS	Preservative
Pesticides	1 L Amber (2)	-
VOCs	40 mL Vials (3)	HCl
Metals	250 mL Plastic (1)	HNO_3

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	~~HAA01~~-MW-10
Date:	12-17-09	Sampled By:	Ryan Kontos		
Sampling Time:	1650	Recorded By:	Ryan Kontos		
Weather:	Clear ~55°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9397 Lamotte R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible	Centrifugal	Bladder / Bailer / (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	2	To:	12
Total Depth:	12.0	Pump Intake Setting:	Middle of Screen 7'		
Depth to Water:	4.41	Volumes to be Purged:	Low Flow		
Water Column:	7.59	Total Volume Purged:	1.68		
Gallons/Foot:	0.16	Pump On:	1545	Off:	1630
Gallons in Well:	1.21				

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1550	5	180ml	750ml	4.50	30.0	5.23	256	17.75	178.8	0.66	
1555	10	↓	↓	4.50	25.5	5.13	254	17.65	196.1	0.51	
1600	15			4.50	18.6	5.11	253	17.31	161.3	0.45	
1605	20			4.50	14.9	5.10	252	17.19	144.1	0.49	
1610	25			4.50	15.8	5.09	250	17.04	135.2	0.38	
1615	30			4.50	12.6	5.08	249	16.96	129.8	0.31	
1620	35			4.50	9.90	5.08	249	16.93	127.1	0.30	
1625	~~35~~ 40			4.50	8.04	5.07	249	16.91	125.9	0.29	
1630	45	↓	↓	4.50	8.88	5.07	248	16.89	124.7	0.27	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTUs
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description: From Lab _____ ARCADIS _____	Preservative
VOC 8260	3 40ml	HCL
Metals 6010	1 500cc PL	HNO3
Pesticides	2 1L AG	—

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HAA-01 MW-18
Date:	12/17/09	Sampled By:	A. PAGNON		
Sampling Time:	1220	Recorded By:	A. PAGNON		
Weather:	50s SUNNY	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-15752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	~5.1 To: 15.1
Total Depth:	~15.10	Pump Intake Setting:	~10 ft BTOC
Depth to Water:	2.78	Volumes to be Purged:	N/A Low Flow
Water Column:	12.32	Total Volume Purged:	~6000 mL
Gallons/Foot:	0.16	Pump On:	1140 Off: 1220
Gallons in Well:	1.97		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen mg/L	Comments
1145	5	150	750	2.95	47.5	5.34	276	17.29	109.2	0.42	—
1150	10	150	1500	2.95	34.7	5.26	282	17.58	113.1	0.63	—
1155	15	150	2250	2.96	17.9	5.18	291	17.53	104.4	0.36	—
1200	20	150	3000	2.95	14.0	5.15	299	17.47	103.7	0.65	—
1205	25	150	3750	2.95	11.3	5.13	299	17.48	103.6	0.59	—
1210	30	150	4500	2.95	11.1	5.15	301	17.46	102.4	0.34	—
1215	35	150	5250	2.96	8.25	5.13	301	17.49	101.8	0.28	—
1220	40	150	6000	2.95	7.31	5.10	305	17.49	102.4	0.26	—
							12/17/09				

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLOUDY (WHITE)	Turbidity(qualitative):	WHITE CLOUDY
Odor:	SLIGHT	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS	Preservative
PESTICIDES	1 L AMBER (2)	—
VOCs	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3
—		—

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAAOI-MW12
Date:	12/17/09	Sampled By:	A. PAGNON		
Sampling Time:	1330	Recorded By:	A. PAGNON		
Weather:	60s SUNNY	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer Peristaltic
Casing Diameter:	2"	Screen Interval: From:	~5.30 To: ~15.30 ft BTOC
Total Depth:	15.30	Pump Intake Setting:	~11 ft BTOC
Depth to Water:	3.79	Volumes to be Purged:	N/A Low Flow
Water Column:	11.69	Total Volume Purged:	~6000 mL
Gallons/Foot:	0.16	Pump On:	1250 Off: 1350
Gallons in Well:	1.87		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1255	5	150	750	4.05	7.33	4.67	139	17.07	163.1	1.21	—
1300	10	150	1500	4.21	2.69	4.60	137	17.23	191.5	0.89	—
1305	15	150	2250	4.23	Ø	4.56	135	17.45	202.0	0.57	—
1310	20	150	3000	4.23	Ø	4.55	135	17.50	207.1	0.44	—
1315	25	150	3750	4.23	Ø	4.52	135	17.60	215.6	0.30	—
1320	30	150	4500	4.23	Ø	4.51	136	17.57	218.2	0.27	—
1325	35	150	5250	4.23	Ø	4.50	136	17.51	222.5	0.25	—
1330	40	150	6000	4.23	Ø	4.50	137	17.49	223.5	0.23	—
							12/17/09				

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	WHITE / CLEAR / YELLOW	Turbidity(qualitative):	CLOUDY / CLEAR
Odor:	SLIGHT	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS	Preservative
PESTICIDE	1 1 AMBER (2)	—
VOCs	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3
—	—	—

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HMW-6
Date:	12-17-09	Sampled By:	Erica Maddox		
Sampling Time:	1540	Recorded By:	Erica Maddox		
Weather:	Sunny. High 40's	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	NA	YSI 556 (R11439)/2020e (R10173)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	3.0 To: 13.0
Total Depth:	15.0	Pump Intake Setting:	Mid screen ~ 8'
Depth to Water:	5.26	Volumes to be Purged:	Low flow
Water Column:	9.8	Total Volume Purged:	~1.75
Gallons/Foot:	0.16	Pump On:	1450 Off: 1555
Gallons in Well:	1.57		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1455	5	180	0	5.24	21.3	6.17	132	20.52	66.1	0.35	
1500	10	180	0.25	5.24	14.4	6.06	126	19.94	85.0	0.09	
1505	15	180	0.5	5.24	10.2	6.05	126	19.71	91.7	0.10	
1510	20	180	0.75	5.24	7.7	6.04	125	19.41	96.1	0.13	
1515	25	180	1.0	5.24	6.49	6.04	125	19.46	97.4	0.13	
1520	30	180	1.25	5.24	4.94	6.04	124	19.46	98.5	0.16	
1525	35	180	1.5	5.24	2.62	6.04	124	19.38	99.9	0.19	
1530	40	180	1.75	5.24	1.98	6.04	124	19.32	100.3	0.18	

EMaddox 12/17/09

Observations During Sampling

Well Condition:	(Good flow rate 10 gpm)	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	
Odor:	None	Other (OVA, HNU,etc.):	

Constituents Sampled	Container Description From Lab V ARCADIS	Preservative
VOCs	40 mL Vial	HCL
SVOCs	1L Amber	None

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HAAGE-MW122D
Date:	12/17/09	Sampled By:	A. PAGNON		
Sampling Time:	1510	Recorded By:	A. PAGNON		
Weather:	60s SUNNY	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	~42.30 To: 52.30 Ft BTOC
Total Depth:	52.30	Pump Intake Setting:	~48 Ft BTOC
Depth to Water:	3.18	Volumes to be Purged:	N/A Low Flow
Water Column:	49.12	Total Volume Purged:	~10500 mL
Gallons/Foot:	0.16	Pump On:	1350 Off: 1510
Gallons in Well:	7.86		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1355	5	150	750	3.21	10.80	6.67	335	18.02	36.2	1.02	
1400	10	150	1500	3.23	8.06	6.80	343	18.24	17.2	0.47	
1405	15	150	2250	3.23	Ø	6.87	345	18.29	-2.3	0.39	
1410	20	150	3000	3.23	Ø	6.92	389	18.33	-43.4	0.44	
1415	25	150	3750	3.23	Ø	6.92	411	18.30	-57.6	0.29	
1420	30	150	4500	3.23	Ø	6.94	421	18.05	-84.3	0.25	
1425	35	150	5250	3.23	Ø	6.95	422	17.89	-97.1	0.25	
1430	40	150	6000	3.23	Ø	6.96	422	17.76	-102.6	0.26	
1435	45	150	6750	3.23	Ø	6.97	421	17.72	-83.8	0.22	
1440	50	150	7500	3.23	Ø	6.98	423	17.25	-107.5	0.34	← PAUSE PUMPING BATTERIES DIED
1455	55	150	8250	3.23	Ø	6.98	422	17.71	-86.5	0.24	
1500	60	150	9000	3.23	Ø	6.98	422	18.06	-72.1	0.18	
1505	65	150	9750	3.23	Ø	7.00	422	18.14	-63.9	0.20	
1510	70	150	10500	3.23	Ø	7.00	422	18.20	-70.2	0.22	
						AA	12/18/09				

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLEAR	Turbidity(qualitative):	CLEAR
Odor:	SLIGHT	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description (From Lab SHEALY ARCADIS)	Preservative
PESTICIDE	1 L AMBER (2)	-
VOCs	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location: Fort Stewart/HAAF | Project No: GP08HAFS | Well ID: HAA01-MW-15
Date: 12-17-09 | Sampled By: Ryan Kontos
Sampling Time: 1225 | Recorded By: Ryan Kontos
Weather: Clear ~60° | Duplicate/QA/QC: N/A

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9397 Lamotte 2020/R9157

Purging Information

Casing Material: PVC
Casing Diameter: 2"
Total Depth: 14.5
Depth to Water: 8.51
Water Column: 5.99
Gallons/Foot: 0.16
Gallons in Well: 0.95

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer (Peristaltic)
Screen Interval: From: 4.5 To: 14.5
Pump Intake Setting: Middle of Screen 9.5'
Volumes to be Purged: Low Flow
Total Volume Purged:
Pump On: 1105 Off: 1205

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or (ml))	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1110	5	150ml	750ml	8.74	15.6	5.10	141	18.25	154.5	0.91	
1115	10	↓	↓	8.82	15.7	5.08	140	18.56	145.2	0.66	
1120	15			8.89	15.0	5.06	139	18.87	137.4	0.51	
1125	20			8.89	16.0	5.08	140	18.68	115.4	0.21	
1130	25			8.89	17.7	5.10	141	18.51	106.1	0.27	
1135	30			8.89	16.9	5.12	141	18.68	99.2	0.32	
1140	35			8.89	17.2	5.13	142	18.84	91.5	0.29	
1145	40			8.89	17.8	5.14	142	18.99	85.1	0.35	
1150	45			8.89	12.6	5.16	142	19.03	73.9	0.30	
1155	50			8.89	9.11	5.18	142	19.16	66.1	0.31	
1200	55			8.89	8.54	5.19	143	19.19	63.5	0.21	
1205	60	↓	↓	8.89	8.39	5.20	143	9.24	62.0	0.24	

Observations During Sampling

Well Condition: Good
Color: Clear
Odor: Slight

Purge Water Disposal: Drum
Turbidity(qualitative): <10 NTU's
Other (OVA, HNU,etc.): N/A

Constituents Sampled	Container Description: From Lab / ARCADIS	Preservative
VOC 8260	3 40ml GG	HCL
Metals 6010	1 500cc PL	HNO3
Pesticides	2 1L AG	

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA01-MW-16
Date:	12-17-09	Sampled By:	Ryan Kontos		
Sampling Time:	0923	Recorded By:	Ryan Kontos		
Weather:	Clear ~ 40°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556 R9397 Lamotte 2020/R 9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	9 To: 19
Total Depth:	19.0	Pump Intake Setting:	Middle of Screen 14'
Depth to Water:	13.90	Volumes to be Purged:	Low Flow
Water Column:	5.1	Total Volume Purged:	~1.5 gal
Gallons/Foot:	0.16	Pump On:	0810 Off: 0850
Gallons in Well:	0.81		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0815	5	150ml	750ml	14.02	1.67	4.72	142	14.62	318.0	1.02	
0820	10	↓	↓	14.03	1.89	4.78	134	14.83	322.0	0.80	
0825	15			14.03	1.54	4.80	124	15.17	334.1	0.69	
0830	20			14.03	1.25	4.83	120	15.73	319.2	0.57	
0835	25			14.03	1.44	4.90	117	16.04	305.4	0.53	
0840	30			14.03	1.60	4.99	116	16.04	273.0	0.39	
0845	35			14.03	1.38	5.03	115	16.10	264.1	0.35	
0850	40	↓	↓	14.03	1.30	5.09	115	16.11	260.3	0.31	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTU's
Odor:	None	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab / ARCADIS	Preservative
VOC 8260	3 40ml CG	HCL
SVOC 8270	2 1L AG	—
Metals 6010	1 500cc PL	HNO3
Pesticides	2 1L AG	—

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location: Fort Stewart/HAAF
Project No. GP08HAFS
Well ID: HAA-01-MW-17
Date: 12-17-09
Sampled By: Erica Maddox
Sampling Time: 1150
Recorded By: Erica Maddox
Weather: Sunny, Mid 40's
Duplicate/QA/QC: NONE

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556 (R11439) / 2020e (R10173)

Purging Information

Casing Material: PVC
Casing Diameter: 2"
Total Depth: 14.5
Depth to Water: 6.87
Water Column: 7.63
Gallons/Foot: 0.16
Gallons in Well: 1.22

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer (Peristaltic)
Screen Interval: From: 4 To: 14.5
Pump Intake Setting: Mid Screen
Volumes to be Purged: Low Flow
Total Volume Purged: 6.2 gal
Pump On: 0950 Off: 1155

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0955	5	160	0.8	6.70	75.7	4.10	124	17.04	234.9	1.83	
1000	10	160	1.6	6.70	75.7	4.07	124	17.02	242.8	1.55	
1005	15	160	2.4	6.70	75.7	4.87	121	17.09	243.4	1.46	
1010	20	160	3.2	6.70	75.7	4.85	121	18.81	233.0	1.33	
1020	30	160	4.8	6.70	75.7	4.85	121	18.93	203.3	1.25	
1030	40	160	6.4	6.70	76.6	4.83	121	18.95	208.2	1.22	
1035	45	160	7.2	6.70	81.2	4.82	123	19.02	211.1	1.25	
1040	50	160	8.0	6.70	81.2	4.07	123	19.05	202.5	1.25	
1045	55	160	8.8	6.70	87.6	4.02	130	19.09	208.0	1.32	
1050	60	160	9.6	6.70	87.6	4.01	136	19.01	207.7	1.32	
1055	65	160	10.4	6.70	85.4	4.01	130	20.73	206.8	1.32	
1100	70	160	11.2	6.70	86.4	4.01	123	21.0	205.2	1.41	
1105	75	160	12.0	6.70	86.1	4.00	123	21.15	206.3	1.41	
1110	80	160	12.8	6.70	85.0	4.00	123	21.26	207.4	1.41	
1115	85	160	13.6	6.70	85.0	3.99	123	20.98	206.9	1.41	

Observations During Sampling

Well Condition: Good
Color: Clear
Odor: None

Purge Water Disposal: Drum
Turbidity(qualitative): Brown tint w/ particles
Other (OVA, HNU,etc.):

Constituents Sampled	Container Description From Lab / ARCADIS	Preservative
VOCs	40mL VOA Vial	HCl

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HAA-01-MW-17
Date:	12-17-09	Sampled By:	Erica Maddox		
Sampling Time:	1155	Recorded By:	Erica Maddox		
Weather:	Sunny, Mid 40's	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	NA	YSI 556 (R11439)/2020e (1210173)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible	Centrifugal	Bladder / Bailer / (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	4	To:	14.5
Total Depth:	14.5	Pump Intake Setting:	Midscreen ~10		
Depth to Water:	6.87	Volumes to be Purged:	Low Flow		
Water Column:	7.63	Total Volume Purged:	1.2 gal		
Gallons/Foot:	0.16	Pump On:	0950	Off:	1155
Gallons in Well:	1.22				

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1120	95	160	4.8	6.70	85.0	3.80	123	20.07	205.4	1.42	
1125	100	160	5.1	6.70	85.0	3.79	123	20.02	205.3	1.42	
1130	105	160	5.4	6.70	85.0	3.79	123	20.06	204.8	1.43	
1135	110	160	5.7	6.70	85.0	3.79	123	20.07	204.8	1.43	
1140	115	160	6.0	6.70	85.0	3.79	123	20.08	204.9	1.43	
1145	120	160	6.3	6.70	85.0	3.79	123	20.08	204.8	1.43	
	Turbidity not stable (below 10 NTU), 5 well volumes removed. Well sampled.										

E. Maddox 12/17/09

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	orange tint w/particles
Odor:	None	Other (OVA, HNU,etc.):	

Constituents Sampled	Container Description: From Lab ✓ ARCADIS	Preservative
VOCs	40 mL VOH vial	HCl

Boring/Casing Volumes

2" = 0.16 4" = 0.65

Page

ARCADIS

Groundwater Sampling Form

Site Location: Fort Stewart/HAAF/HAA-3 Project No. GP08HAFS **Well ID:** HMW-2

Date: 12-16-09 Sampled By: Erica Medlock

Sampling Time: 1105 Recorded By: Erica Medlock

Weather: Sunny Low 50's Duplicate/QA/QC: None

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	--- ---	YSI 556 (R1430) / Hach (R9441)

Purging Information

Casing Material: PVC

Casing Diameter: 2"

Total Depth: 16.16

Depth to Water: 11.98

Water Column: 4.18

Gallons/Foot: 0.16

Gallons in Well: 0.66

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer (Peristaltic)

Screen Interval: From: 4.6 To: 14.6

Pump Intake Setting: mid screen ~ 9.6

Volumes to be Purged: Low Flow

Total Volume Purged: 5.75

Pump On: 0835 Off: 1105

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0845	5	165	0.20	12.50	196	6.42	44	21.83	164.7	4.97	
0850	10	165	0.40	12.50	150	6.11	33	22.16	158.6	3.52	
0855	15	165	0.60	12.50	114	5.99	30	22.02	163.8	3.37	
0900	20	165	0.80	12.50	103	5.98	29	22.16	164.6	3.46	
0905	25	165	1.0	12.50	97.6	5.91	28	22.10	162.9	3.49	
0910	30	165	1.20	12.50	92.5	5.86	28	22.09	162.3	3.48	
0915	35	165	1.40	12.50	89.3	5.83	28	22.04	161.3	3.48	
0920	40	165	1.60	12.50	88.3	5.83	28	22.01	160.9	3.48	
0925	45	165	1.80	12.50	86.5	5.82	28	22.02	160.5	3.31	
0930	50	165	2.00	12.50	84.1	5.81	27	22.02	159.3	3.47	
0935	55	165	2.20	12.50	82.1	5.80	27	22.01	158.6	4.02	
0940	60	165	2.40	12.50	80.2	5.80	27	22.02	158.5	4.10	
0945	65	165	2.60	12.50	78.5	5.79	27	22.05	161.4	4.16	
0950	70	165	2.80	12.50	77.2	5.78	27	22.05	162.7	4.21	
0955	75	165	3.00	12.50	76.1	5.78	27	22.09	163.2	4.23	

Observations During Sampling

Well Condition: Fair (cracks missing well ID) Purge Water Disposal: Ground

Color: Clear Turbidity(qualitative): slightly cloudy

Odor: None Other (OVA, HNU,etc.): ---

Constituents Sampled	Container Description: From Lab 4 ARCADIS ___	Preservative
VOCs	4 x 40 mL vials	HCl

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HNW-2
Date:	12/16/09	Sampled By:	Erica Maddox		
Sampling Time:	1105	Recorded By:	Erica Maddox		
Weather:	Sunny, Low 50's	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	NA	YSI 556 (R11439)/ 2020c (R11641)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	4.16 To: 14.16
Total Depth:	16.10	Pump Intake Setting:	Midscreen ≈ 9.16
Depth to Water:	11.98	Volumes to be Purged:	Low Flow
Water Column:	4.12	Total Volume Purged:	5.75
Gallons/Foot:	0.16	Pump On:	0935 Off: 1115
Gallons in Well:	0.66		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss Oxygen	Comments
1000	90	165	3.20	12.50	16.3	5.43	27	20.60	166.8	4.01	
1005	95	165	3.40	12.50	17.9	5.45	27	20.87	166.6	3.66	
1010	100	165	3.60	12.50	17.1	5.39	27	20.96	166.9	3.79	
1015	105	165	3.80	12.50	21.1	5.41	27	21.12	166.6	3.62	
1020	110	165	4.00	12.50	22.1	5.42	27	21.24	166.5	3.32	
1025	115	165	4.20	12.50	24.2	5.45	27	21.28	165.2	2.62	
1030	120	165	4.40	12.50	27.1	5.46	27	21.31	166.3	4.15	
1035	125	165	4.60	12.50	27.1	5.42	27	21.33	166.5	3.60	
1040	130	165	4.80	12.50	26.5	5.43	26	21.36	167.7	3.84	
1045	135	165	5.00	12.50	28.5	5.42	26	21.43	169.9	3.92	
1050	140	165	5.25	12.50	26.0	5.36	26	21.56	172.4	4.00	
1055	145	165	5.50	12.50	25.6	5.32	27	21.77	176.5	3.79	
1100	150	165	5.75	12.50	31.1	5.34	27	21.77	174.7	3.83	
Well not pushed / purged dry - well developed / sampled.											

Observations During Sampling

Well Condition:	Fair (rusty, missing well ID)	Purge Water Disposal:	Drum
Color:	clear	Turbidity(qualitative):	slightly cloudy, tint
Odor:	None	Other (OVA, HNU,etc.):	—

Constituents Sampled	Container Description: From Lab V ARCADIS	Preservative
VOCs	40 mL VOA vial	HCL

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAAW-4
Date:	12-17-09	Sampled By:	Erica Haddox		
Sampling Time:	0926	Recorded By:	Erica Haddox		
Weather:	Sunny Low 40's	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556 (K114139) / 2020e (K10173)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer Peristaltic
Casing Diameter:	2"	Screen Interval: From:	2 To: 12
Total Depth:	15.0	Pump Intake Setting:	Middle of screen
Depth to Water:	5.98	Volumes to be Purged:	Low Flow
Water Column:	9.02	Total Volume Purged:	~2.0
Gallons/Foot:	0.16	Pump On:	0910 Off: 0930
Gallons in Well:	1.44		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0925	0	150	0	6.08	8.10	7.16	154	16.42	101.6	3.12	
0940	5	150	.25	6.08	5.33	6.13	144	16.42	98.1	2.94	
0945	10	150	.5	6.08	4.99	6.12	141	16.41	104.1	2.96	
0950	15	150	.75	6.08	4.61	6.07	142	16.83	107.6	2.91	
0955	20	150	1.0	6.08	4.03	6.05	145	16.71	112.3	2.95	
1000	25	150	1.25	6.08	3.77	6.04	149	16.70	115.4	2.84	
1005	30	150	1.50	6.08	3.01	6.04	152	16.54	119.9	2.66	
1010	35	150	1.75	6.08	2.93	6.04	155	16.53	122.6	2.63	
1015	40	150	2.0	6.08	2.22	6.04	155	16.50	125.5	2.67	
								1650 6mm			

Collected 1 blank @ 12/17/09

Observations During Sampling

Well Condition:	OK no well ID tag	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	—
Odor:	None	Other (OVA, HNU,etc.):	—

Constituents Sampled	Container Description From Lab ___ ARCADIS ___	Preservative
VOCs	3x 40mL VOA vials	HCl

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HMW-6
Date:	12-16-09	Sampled By:	Erica Maddox		
Sampling Time:	1225	Recorded By:	Erica Maddox		
Weather:	Sunny, Low 50's	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	----	YSI 556 (K11439)/2200 (K9641)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	3 To: 13
Total Depth:	15.5	Pump Intake Setting:	middle of screen ≈ 8
Depth to Water:	6.5	Volumes to be Purged:	Low Flow
Water Column:	9.5	Total Volume Purged:	1.75
Gallons/Foot:	0.16	Pump On:	1140 Off: 1245
Gallons in Well:	1.52		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1145	5	170	0	6.21	21.3	6.06	149	19.58	172.8	2.53	
1150	10	170	.25	6.21	9.25	6.07	153	19.56	168.0	2.27	
1155	15	170	.5	6.21	6.21	6.08	162	19.30	166.9	2.34	
1200	20	170	.75	6.21	4.95	6.06	166	19.25	163.5	2.05	
1205	25	170	1.0	6.21	4.02	6.09	167	19.34	162.1	2.02	
1210	30	170	1.25	6.21	4.23	6.10	172	19.39	160.0	1.76	
1215	35	170	1.5	6.21	3.13	6.10	175	19.37	156.9	1.71	
1220	40	170	1.75	6.21	3.05	6.11	176	19.34	153.4	1.62	

Erica Maddox 12/16/09

Observations During Sampling

Well Condition:	Good (Secure)	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	----
Odor:	None	Other (OVA, HNU,etc.):	----

Constituents Sampled	Container Description: From Lab ✓ ARCADIS ____	Preservative
VOCs	40 mL VOA vials	HCl

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HMW-1
Date:	12-16-09	Sampled By:	Erica Maddox		
Sampling Time:	1710	Recorded By:	Erica Maddox		
Weather:	Sunny, Low 50's	Duplicate/QA/QC:	None		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	NA	YSI 556 (R1143a) / 2020e (R0641)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	5 To: 15
Total Depth:	15.0	Pump Intake Setting:	Midscreen ~ 10
Depth to Water:	6.77	Volumes to be Purged:	Low Flow
Water Column:	8.23	Total Volume Purged:	1.5
Gallons/Foot:	0.16	Pump On:	1620 Off: 1715
Gallons in Well:	0.997		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss Oxygen	Comments
1635	5	150	0.75	8.80	19.2	6.70	368	19.72	134.0	2.50	
1640	10	150	0.25	8.80	15.6	6.76	363	19.67	132.1	2.13	
1645	15	150	0.5	8.80	11.3	6.76	362	19.61	132.3	2.05	
1650	20	150	0.75	8.80	6.9	6.69	361	19.55	132.1	1.97	
1655	25	150	1.0	8.80	3.2	6.68	362	19.91	124.4	2.02	
1700	30	150	1.25	8.80	2.2	6.66	362	19.94	120.6	1.95	
1705	35	150	1.5	8.80	1.5	6.61	361	19.92	118.5	1.96	

Observations During Sampling

Well Condition:	Locked, well ID	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	—
Odor:	None	Other (OVA, HNU,etc.):	—

Constituents Sampled	Container Description: From Lab ✓ ARCADIS	Preservative
VOCs	40 mL VOA Vial	HCl

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HMW-10
Date:	12-17-09	Sampled By:	Ryan Kontos		
Sampling Time:	1046	Recorded By:	Ryan Kontos		
Weather:	Clear ~45-50°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/R9397 Lamotte 2020/R9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	2.7 To: 12.8
Total Depth:	12.8	Pump Intake Setting:	Middle of screen ~8'
Depth to Water:	6.28	Volumes to be Purged:	Low Flow
Water Column:	6.52	Total Volume Purged:	1.68 gal
Gallons/Foot:	0.16	Pump On:	0945 Off: 1030
Gallons in Well:	1.04		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml/)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
0950	5	150ml	750ml	6.33	7.21	5.44	171	13.34	236.3	0.80	
0955	10	↓	↓	6.34	3.98	5.43	171	13.44	239.3	0.71	
1000	15			6.34	3.45	5.41	172	13.56	242.1	0.68	
1005	20			6.34	3.06	5.35	172	13.99	233.3	0.53	
1010	25			6.34	3.73	5.30	171	14.28	227.1	0.41	
1015	30			6.34	3.44	5.28	171	14.43	216.1	0.34	
1020	35			6.34	2.91	5.27	171	14.51	207.5	0.30	
1025	40			6.34	2.50	5.24	172	14.66	201.0	0.27	
1030	45	↓	↓	6.34	2.22	5.27	172	14.70	191.4	0.31	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTUs
Odor:	Slight	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab / ARCADIS	Preservative
VOC 8260	3 40ml CG	HCL
SVOC 8270	2 1L AG	—

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HMW-11
Date:	12-16-09	Sampled By:	Erica Maddox		
Sampling Time:	1408	Recorded By:	Erica Maddox		
Weather:		Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	NA	YSI 556 (R11439)/2020e (R11641)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	4.7 To: 14.6
Total Depth:	18.07	Pump Intake Setting:	Midscreen ≈ 9
Depth to Water:	9.6	Volumes to be Purged:	Low Flow
Water Column:	8.47	Total Volume Purged:	1.25
Gallons/Foot:	0.16	Pump On:	1330 Off: 1
Gallons in Well:	1.36		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1335	5	150	0	9.63	3.15	5.34	285	20.37	141.9	3.72	
1340	10	150	.25	9.63	3.58	5.47	288	20.82	157.4	0.19	
1345	15	150	.50	9.63	2.56	5.47	289	20.18	159.5	0.16	
1350	20	150	.75	9.63	2.17	5.47	290	20.72	163.9	0.14	
1355	25	150	1.0	9.63	1.95	5.45	291	20.73	168.1	0.12	
1400	30	150	1.25	9.63	1.74	5.42	290	20.72	170.3	0.11	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	
Color:	Clear	Turbidity(qualitative):	Light yellow tint
Odor:	None	Other (OVA, HNU,etc.):	

Constituents Sampled	Container Description From Lab _____ ARCADIS _____	Preservative
VOCs	40 mL VOA vials	HCl

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HMW-13
Date:	12-17-09	Sampled By:	Ryan Kontas		
Sampling Time:	1521	Recorded By:	Ryan Kontas		
Weather:	Clear ~60°	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	N/A	YSI 556/9397 Lamotte 2020/9151

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer Peristaltic
Casing Diameter:	2"	Screen Interval: From:	7.5 To: 17.6
Total Depth:	17.6	Pump Intake Setting:	Middle of Screen 12.5'
Depth to Water:	12.26	Volumes to be Purged:	Low Flow
Water Column:	5.34	Total Volume Purged:	1.87 gal
Gallons/Foot:	0.16	Pump On:	1415 Off: 1505
Gallons in Well:	0.85		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1420	5	150ml	750ml	12.44	237	5.94	265	20.88	-3.8	0.78	
1425	10	↓	↓	12.46	20.6	5.96	268	21.42	-0.5	0.54	
1430	15			12.46	16.7	5.95	270	21.37	-3.1	0.38	
1435	20			12.46	15.0	5.95	273	21.35	-6.6	0.35	
1440	25			12.46	14.2	5.95	271	21.34	-3.4	0.27	
1445	30			12.46	13.6	5.95	270	21.40	0.5	0.23	
1450	35			12.46	11.1	5.95	270	21.31	-2.4	0.21	
1455	40			12.46	9.56	5.95	270	21.30	0.2	0.25	
1500	45			12.46	7.24	5.95	270	21.30	0.8	0.22	
1505	50	↓	↓	12.46	8.69	5.95	269	21.28	0.3	0.18	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	<10 NTU's
Odor:	Slight	Other (OVA, HNU,etc.):	N/A

Constituents Sampled		Container Description From Lab	ARCADIS	Preservative
VOC	8260	3 40ml	CG	HCL
SVOC	8270	2 1L	AG	

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-01 (HHW-21)
Date:	12/17/09	Sampled By:	A. PAGNON		
Sampling Time:	1655	Recorded By:	A. PAGNON		
Weather:	60s SUNNY	Duplicate/QA/QC:	NONE		

HAD TO SAMPLE LAST B/C OF PAINT WAR EXERCISE

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	N/A	YSI / TURBIDITY
Serial #:	N/A	07F100307 / ME-10752

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	~5.5 To: 15.5
Total Depth:	~15.50	Pump Intake Setting:	~10 ft BTOC
Depth to Water:	3.04	Volumes to be Purged:	N/A Low Flow
Water Column:	12.46	Total Volume Purged:	~9000 mL
Gallons/Foot:	0.16	Pump On:	1555 Off: 1655
Gallons in Well:	1.99		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1600	5	150	750	3.53	60.6	6.51	247	17.76	48.2	0.81	—
1605	10	150	1500	3.53	40.4	6.49	242	17.41	37.7	0.57	—
1610	15	150	2250	3.53	17.6	6.31	233	17.54	24.6	0.42	—
1615	20	150	3000	3.53	14.32	6.20	222	17.60	11.2	0.38	—
1620	25	150	3750	3.53	Ø	6.17	214	17.61	5.8	0.30	—
1625	30	150	4500	3.53	Ø	6.16	210	17.60	11.0	0.33	—
1630	35	150	5250	3.53	Ø	6.15	201	17.63	6.8	0.23	—
1635	40	150	6000	3.53	Ø	6.12	193	17.65	3.4	0.21	—
1640	45	150	6750	3.53	Ø	6.17	189	17.65	-1.7	0.24	—
1645	50	150	7500	3.53	Ø	6.11	180	17.66	-9.9	0.19	—
1650	55	150	8250	3.53	Ø	6.15	181	17.65	-12.1	0.20	—
1655	60	150	9000	3.53	Ø	6.15	179	17.64	-12.9	0.18	—
							12/17/09				

Observations During Sampling

Well Condition:	GOOD	Purge Water Disposal:	DRUM
Color:	CLEAR / YELLOW TINT	Turbidity(qualitative):	SMALL WHITE PARTICLES
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description From Lab SHEALY ARCADIS	Preservative
PESTICIDES	1 L AMBER (2)	—
VOCs	40 mL VIALS (3)	HCl
METALS	250 mL PLASTIC (1)	HNO_3
—	—	—

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	**Well ID:**	HMW-23
Date:	12-17-09	Sampled By:	Erica Maddox		
Sampling Time:	1420	Recorded By:	Erica Maddox		
Weather:	Sunny, Low 40's	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	NA	YSI 556 (R11439) / 200a (R10173)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible	Centrifugal	Bladder / Bailer / (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	5.0	To:	15.0
Total Depth:	15.0	Pump Intake Setting:	Midscreen = 10		
Depth to Water:	5.98	Volumes to be Purged:	Low Flow		
Water Column:	9.02	Total Volume Purged:	2.0		
Gallons/Foot:	0.16	Pump On:	1330	Off:	1440
Gallons in Well:	1.44				

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1335	5	180	0	5.95	35.7	5.66	335	15.65	9.6	4.66	
1340	10	180	0.25	5.95	25.6	5.61	333	16.36	20.3	0.42	
1345	15	180	0.5	5.95	21.1	5.62	336	16.33	21.5	0.25	
1350	20	180	0.75	5.95	9.3	5.66	342	16.36	23.4	0.25	
1355	25	180	1.0	5.95	4.6	5.64	344	16.33	20.9	0.18	
1400	30	180	1.25	5.95	1.5	5.64	345	16.31	20.7	0.17	
1405	35	180	1.5	5.95	0.6	5.65	347	16.38	20.4	0.17	
1410	40	180	1.75	5.95	1.0	5.62	348	16.29	20.2	0.17	
1415	45	180	2.0	5.95	0.5	5.66	352	16.24	19.8	0.16	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	
Color:	Clear/Light yellow tint	Turbidity(qualitative):	orange particles
Odor:	NONE	Other (OVA, HNU,etc.):	

Constituents Sampled	Container Description: From Lab ✓ ARCADIS	Preservative
VOCs	40 mL Vial	HCl
SVOCs	1L Amber	NONE

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA-MW-23
Date:	1/18/10	Sampled By:	Ryan Kontos / Arcadis		
Sampling Time:	1422	Recorded By:	Ryan Kontos / Arcadis		
Weather:	Sunny ~65°	Duplicate/QA/QC:	NO		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	YSI 556 / R10404	Lamotte 2020 / R87167

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	12 To: 17
Total Depth:	17.0	Pump Intake Setting:	Middle of screen ~ 14.5
Depth to Water:	5.07	Volumes to be Purged:	Low Flow
Water Column:	11.93	Total Volume Purged:	~2.1 gal
Gallons/Foot:	0.16	Pump On:	1335 Off: 1410
Gallons in Well:	1.90		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1340	5	250ml	0.3gal	5.37	11.4	5.46	366	17.23	-134.6	1.15	
1345	10	↓	0.3	5.38	3.62	5.41	362	17.00	-132.5	1.07	
1350	15		0.3	5.38	3.11	5.37	363	16.90	-127.1	0.84	
1355	20		0.3	5.38	2.89	5.36	364	16.90	-123.7	0.65	
1400	25		0.3	5.38	3.09	5.35	365	16.87	-128.1	0.55	
1405	30		0.3	5.38	3.50	5.35	367	16.91	-126.2	0.61	
1410	35	↓	0.3	5.38	2.92	5.35	367	16.95	-123.1	0.58	

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	410 NTU
Odor:	NONE	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description: From Lab	ARCADIS	Preservative
VOC	3/40ml	CC	HCL
SVOC			

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HMW-24
Date:	12-17-09	Sampled By:	Erica Maddox		
Sampling Time:	1315	Recorded By:	Erica Maddox		
Weather:	Sunny, High 40's	Duplicate/QA/QC:	NONE		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	NA	YSI 556 (R.11439) / 2020e (R.10173)

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	7.6 To: 12.6
Total Depth:	12.60	Pump Intake Setting:	Mid screen ~9.0
Depth to Water:	5.95	Volumes to be Purged:	Low Flow
Water Column:	6.65	Total Volume Purged:	2.75
Gallons/Foot:	0.16	Pump On:	1215 Off: 1320
Gallons in Well:	0.97		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1220	5	160	0	5.90	35.1	5.90	2.71	17.36	54.8	0.63	
1225	10	180	0.25	5.90	24.3	5.97	2.73	17.41	35.1	0.24	
1230	15	180	0.5	5.90	15.1	5.95	2.73	17.47	29.7	0.09	
1235	20	180	0.75	5.90	7.1	6.00	2.76	17.75	18.1	0.08	
1240	25	180	1.0	5.90	6.3	5.99	2.75	17.61	13.0	0.08	
1245	30	160	1.25	5.90	6.0	5.99	2.79	17.66	9.0	0.09	
1250	35	180	1.5	5.90	5.6	5.99	2.79	17.61	3.0	0.08	
1255	40	180	1.75	5.90	11.8	5.98	2.78	17.72	-0.2	0.06	
1300	45	180	2.0	5.90	3.0	5.99	2.75	17.59	-4.6	0.04	
1305	50	180	2.25	5.90	2.7	5.96	2.73	17.60	-4.9	0.04	
1310	55	180	2.5	5.90	2.3	5.98	2.77	17.63	-5.1	0.04	
1315	60	180	2.75	5.90	2.3	5.99	2.77	17.61	-5.2	0.04	
				Cased Washdown			12/17/09				

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	Some turbidity
Odor:	None	Other (OVA, HNU,etc.):	

Constituents Sampled	Container Description From Lab V ARCADIS	Preservative
VOCs	40 mL Vial	HCl
SVOCs	1L Amber	None

Boring/Casing Volumes
2" = 0.16 4" = 0.65

Well Inspection Log
Site Location HAA-01
Sampler(s) Name(s): A. Pagnan, E. Maddox, R. Kontondelakakis
Date 12/15/2009

	Gauging Date	Water Level (ft bTOC)	Well ID visible	Concrete pad intact	Well cap intact and water-tight	Water in Vault	Well locked or bolted down	Well casing in good condition	Other Observations
COE-MW-1	12/15/09	12.56	yes	yes	yes	NO	yes	Good	
COE-MW-2		11.29	yes	yes	yes	NO	yes	Good	
COE-MW-3		11.15	yes	yes	yes	NO	yes	Good	
COE-MW-4		3.26	yes	yes	yes	NO	yes	Good	
COE-MW-5		2.60	yes	yes	yes	NO	yes	Good	
COE-MW-6		3.25	yes	yes	yes	NO	yes	Good	
COE-MW-7		3.40	yes	yes	yes	NO	yes	Good	
COE-MW-8		3.61	yes	yes	yes	NO	yes	Good	
HMW-1		13.70	NO	yes	yes	NO	yes	Fair	NO ID Label/hinge broke to well lid
HMW-2		12.02	NO	yes	yes	NO	yes	Good	NO ID Label
HMW-3		7.51	yes	yes	yes	NO	yes	Good	
HMW-4		5.61	yes	yes	yes	NO	yes	Good	
HMW-5		8.27	NO	yes	yes	NO	yes	Fair	NO ID Lab. / hinge broke on well lid
HMW-6		5.18	NO	yes	yes	NO	yes	Fair	NO ID Lab. / hinge broke on well lid
HMW-8		6.03	yes	yes	yes	NO	yes	Good	NO survey mark
HMW-9		8.72	yes	yes	yes	NO	yes	Good	NO ID / NO survey mark
HMW-10		6.44	yes	yes	yes	NO	yes	Good	
HMW-11		9.88	yes	yes	yes	NO	yes	Good	
HMW-12	↓	11.29	yes	yes	yes	NO	yes	Good	

Well Inspection Log
Site Location HAA-01
Sampler(s) Name(s): A. Pagnon, E. Maddox, R. Kmtondalaska
Date 12/15/09

	Gauging Date	Water Level (ft bTOC)	Well ID visible	Concrete pad intact	Well cap intact and water-tight	Water in Vault	Well locked or bolted down	Well casing in good condition	Other Observations
HMW-13	12/15/09	12.8	NO	Yes	Yes	NO	Yes	Good	NO ID label
HMW-14R		11.47	Yes	Yes	Yes	NO	Yes	Good	
HMW-15		5.53	Yes	Yes	Yes	NO	Yes	Good	
HMW-16A		9.56	Yes	Yes	Yes	NO	Yes	Good	
HMW-17		7.82	Yes	Yes	Yes	NO	Yes	Good	
HMW-18		7.03	Yes	Yes	Yes	NO	Yes	Good	
HMW-19		12.19	Yes	Yes	Yes	NO	Yes	Good	
HMW-20		3.70	Yes	Yes	Yes	NO	Yes	Good	
HMW-21		2.99	Yes	Yes	Yes	NO	Yes	Good	
HMW-22		13.98	Yes	Yes	Yes	NO	Yes	Good	
HMW-23		5.30	Yes	Yes	Yes	NO	Yes	Good	
HMW-24		5.47	Yes	Yes	Yes	NO	Yes	Good	
HAA01-MW-9		10.95	Yes	Yes	Yes	NO	Yes	Good	
HAA01-MW-10		4.25	Yes	Yes	Yes	NO	Yes	Good	
HAA01-MW-11		2.66	Yes	Yes	Yes	NO	Yes	Good	
HAA01-MW-12		4.35	Yes	Yes	Yes	NO	Yes	Good	
HAA01-MW-12D		3.05	Yes	Yes	Yes	NO	Yes	Good	
HAA01-MW-13		2.51	Yes	Yes	Yes	NO	Yes	Good	
HAA01-MW-14	↓	4.50	Yes	Yes	Yes	NO	Yes	Good	

Well Inspection Log
Site Location HAA-01
Sampler(s) Name(s): A. Pagnon, E. Maddox, R. Kontaxakis
Date 12/15/09

	Gauging Date	Water Level (ft bTOC)	Well ID visible	Concrete pad intact	Well cap intact and water-tight	Water in Vault	Well locked or bolted down	Well casing in good condition	Other Observations
HAA01-MW-14D	12/15/09	3.10	yes	yes	yes	NO	yes	Good	
HAA01-MW-15		8.81	yes	yes	yes	NO	yes	Good	
HAA01-MW-16		14.1	yes	yes	yes	NO	yes	Good	
HAA01-MW-17		5.65	yes	yes	yes	NO	yes	Good	
HAA01-MW-18	↓	8.81	yes	yes	yes	NO	yes		

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NAL.TM

Date 2-2-09

Site Location: HAA-001/Fire Tng Area, HAAF

Monitoring Well Number HMW-02

Rep./Field Blank No. _____

Sample Collection Time 1110

Weather- clear - 60°F

Sampling Method Low Flow

Evacuation Data.

Depth to bottom of well (ft bls) 15.0

Casing stick-up above concrete (feet) _____

Depth to water from top of casing 14.21

Screened Interval (ft bls) 4.6 - 14.6

Water Column 0.79 (ft) Gallons in well 0.12

Casing Diameter: 2"

Evacuation Volume (x) = _____

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (mS/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1055	0.10	15.23	5.34	5.59	0.064	487	345	0.06	14.28
1100	0.10	18.64	5.43	.	0.049	29.1	332	0.06	14.29
1105	0.10	18.62	5.40	5.32	0.049	28.7	334	0.06	14.31
1110	0.10	19.60	J	.	0.048	.	336	0.06	14.33

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
8270 – SVOCs	1 lt Amber Glass	<4°C
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Remarks _____

Sampling Personnel J O'BRIEN

C:\Documents and Settings\jobrien\My Documents\Projects\HAAF_Ft Stewart\HAA 001 fire tng arc,) area\SAMPLE LOGS.docx

ARCADIS

WATER SAMPLING LOG

Project No. GP08IIAFS.I101A.NALTM
Site Location: IIAA-001/Fire Tng Area, IIAAF
Rep./Field Blank No.
Weather SUNNY 52°F

Date
Monitoring Well Number HMW-04
Satnple Collection Time 09?-C
Sampling Method Low Flow

Evacuation Data:'

Depth to bottom of \~el(ft-ls) 15.0
Depth to water from top of caring 9.49
Water Column 5.51 (ft) Gallons in Well 0.9
Evacuation Volume (x) =

Casing stick-up above concrete (feet)
Screened Interval (ft bls) 3.0-13.0
Casing Diameter: 2"
Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg L)	Cond. (~~µmhos~~/cm)	Turb (NTU)	Redox (mV)	Flow (mL min)	Depth to Water (ft)
0935	0.1	15.61	6.51	3.03	0.278	99	97	0.08	9.53
0940	0.1	16.46	6.58	1.33	0.302	6.7	64	0.08	9.57
0945	0.1	16.51	6.59	1.34	0.303	6.2	63	0.08	9.59
0950	0.1	16.50	6.59	1.31	0.303	7.6	62	0.09	9.60

Analvses

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks

Sampling Personnel J. OBRIEN

C:\Documents and Settings\Jobrien\My Documents\Projects\IIAAF_Ft Stewart\IIAA 001 fire tng area area SAMPLE LOGS ~1ac\

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NAL.TM

Date 8-3-09

Site Location: HAA-001/Fire Trn Area, HAAF

Monitoring Well Number HMW-06

Rep./Field Blank No. —

Sample Collection Time 1430

Weather Sunny ~ 75 F

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15.0

Casing stick-up above concrete (feet) _____

Depth to water from top of casing 9.13

Screened Interval (ft bls) 3.0 - 13.0

Water Column 5.87 (A) Gallons in well 0.94

Casing Diameter: 2"

Evacuation Volume (x) = _____

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µS/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1415	0.1	16.17		4.9	0.273	.7	-7	0.06	9.18
1420	0.1	16.19	6.34	0.32	0.269	0.9	-20		9.24
1425	0.1	16.19	6.34	0.31	0.270	.		0.06	9.27
1430	0.1	16.21	.	0.30	0.271	0.9	-21	0.06	9.33

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks _____

Sampling Personnel J. O'Brien

C:\Documents and Settings\Jobrien\My Documents\Projects\HAAF_Ft Irwin HAA 001 fire trng area area SAMPLE LOGS.docx

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 2-3 09

Site Location: HAA-001/Fire Tng Area, HAAF

Monitoring Well Number HMW 05

Rep./Field Blank No.

Sample Collection Time 0905

Weather Cloudy 45° F

Sampling Method Low Flow

Evacuation Data'

Depth to bottom of well (ft bls) 15.0

Casing stick-up above concrete (feet)

Depth to water from top of casing 9.06

Screened Interval (ft bls) 7.0-13.0

Water Column 5.94 (ft) Gallons in well 1.0

Casing Diameter: 2"

Evacuation Volume (x) =

Casing Volume 1"=0.04 gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (mS/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
0850	0.1	15.32	6.47	4.12	0.221	7.5	96	0.08	9.10
0855	0.1	"	"	4.19	0.217	7.3	126	0.08	9.12
0900	0.1	15.64	6.36	"	0.217	8.1	127	0.09	9.17
0905	0.1	15.62	6.37	4.21	0.216	7.9	129	0.09	9.16

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks

Sampling Personnel J. OBRIEN

C:\Documents and Settings\Jobrien\My Documents\Projects\HAAF_Ft Stewart\HAA 001 fire tng area area SAMPLE LOG\ docx

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 2-3-09

Site Location: HAA-001/Fire Tng Area, HAAF

Monitoring Well Number HMW-09

Rep./Field Blank No.

Sample Collection Time 0825

Weather Clear 30°F

Sampling Method Low Flow

Evacuation Data,

Depth to bottom of well (ft bls) 15.0

Casing stick-up above concrete (feet)

Depth to water from top of casing 11.44

Screened Interval (ft bls) 5.0-15.0

Water Column 3.56 (ft) Gallons in well 0.6

Casing Diameter: 2"

Evacuation Volume (x) =

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (mS/cm) (µmhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL min)	Depth to Water (ft)
0810	0.1	18.43	6.57	101	0.276	18.2	118	0.05	11.47
0815	0.1	19.30	6.35	0.47	0.277	7.8	81	0.09	11.51
0820	0.1	19.24	6.35	0.48	0.277	6.2	80	0.09	11.52
0825	0.1	19.23	6.35	0.46	0.277	6.9	79	0.08	11.54

Analyses:

Analytical Paramcter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks

Sampling Personnel J OBRIEN

C:\Documents and Settings\Jobrien\My Documents\Projects\HAAF_Ft Stewart\HAA 001 fire tng area area SAMPLE LOGS.docx

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 2 3 09

Site Location: HAA-001/Fire Tng Area, HAAF

Monitoring Well Number HMW-10

Rep./Field Blank No.

Sample Collection Time 1042

Weather Sunny 50°F

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 14.0

Casing stick-up above concrete (feet)

Depth to water from top of casing 5.75

Screened Interval (ft bls) 2.7-12.6

Water Column 8.25 (ft) Gallons in well 1.6

Casing Diameter: 2"

Evacuation Volume (x) =

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM
Site Location: HAA-001/Fire Tng Area, HAAF
Rep. Field Blank No.
Weather Cloudy 60°F

Date 2-2-09
Monitoring Well Number HMW-13
Sample Collection Time 1145
Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 18.0
Depth to water from top of casing ~~TOC~~ 13.71
Water Column 4.29 (ft) Gallons in well 0.7
Evacuation Volume (x) =

Casing stick-up above concrete (feet)
Screened Interval (ft bls) 7.5-17.6
Casing Diameter: 2"
Casing Volume 1"=0.04 gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (~~µmhos~~/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1130	0.1	18.14	6.08	1.24	0.325	6.8	-55	0.08	13.74
1135	0.1	19.57	6.16	0.54	0.316	7.9	-72	0.08	13.77
1140	0.1	19.60	6.16	0.53	0.316		-73	0.08	13.79
1145	0.1	19.61	6.16	0.51	0.313	7.6	-72	0.08	13.81

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
[redacted]	[redacted]	[redacted]

Remarks Strong petroleum odor

Sampling Personnel J. O'BRIEN

C:\Documents and Settings\Jobrien\My Documents\Projects\HAAF_Ft Stewart\HAA 001 fire tng area area\SAMPLE LOGS.docx

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM
Site Location: HAA-001/Fire Tng Area, HAAF
Rep./Field Blank No.
Weather Sunny 50°F

Date 2-3-09
Monitoring Well Number HMW-23
Sample Collection Time 1200
Sampling Method ~~Low Flow~~

Evacuation Data:

Depth to bottom of well (ft bls) 15.0
Depth to water from top of casing 6.68
Water Column 8.32 (ft) Gallons in well 1.0

Casing stick-up above concrete (feet)
Screened Interval (ft bls) 5.0-15.0
Casing Diameter: 2"
Casing Volume 1"=0.04 gal/ft, 2"=0.16 gal/ft

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 2-3-09

Site Location: HAA-001/Fire Tng Area, HAAF

Monitoring Well Number HMW-24

Rep./Field Blank No.

Sample Collection Time 1245

Weather Cloudy 35°F

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well(ft bls) 12.0

Casing stick-up above concrete (feet)

Depth to water from top of casing 9.28

Screened Interval (ft bls) 7.0-12.0

Water Column 2.72 (ft) Gallons in well 1.6

Casing Diameter: 4"

Evacuation Volume (x) =

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µS/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1230	0.25	16.22	6.55	0.37	0.465	11.9	-13	200	9.27
1235	0.25	16.36	6.54	0.26	0.467	7.0	-36	0.2	9.29
1240	0.25	16.34	6.55	0.17	0.467	6.4	-37	0.2	9.28
1245	0.25	16.33	6.54	0.16	0.467	5.9	-37	0.2	9.28

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks

Sampling Personnel J. O'BRIEN

ARCADE

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Site Location: HAA-001 'Fire Trg Area, HAAF

Rep. Field Blank Yo

Weather Sunny 50°F

Date 3.3.09

Monitoring Well Number HMW-11

Sample Collection Time 1330

Sampling Method ~~Low-Flow~~

Evacuation Data.

Depth to bottom of well (ft bls)

Depth to water from top of casing 12.70

Water Column 2.3 (ft) Gallons in well 0.4

Evacuation Volume (x) =

Casing stick-up above concrete (feet)

Screened Interval (ft bls) 4.7-14.8

Casing Diameter: 2"

Casing Volume 1"=0.04 ~~gal~~ gal/ft 2"=0.16 ~~gal~~/ft

Field Parameters

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond (µmhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1315	0.1	18.57	5.65	.	0.337	16.9	113	0.08	12.74
1320	.1	16.69	5.58	0.32	0.337	16.1	142	0.08	12.77
1325	0.1	16.92	5.56	0.31	0.339	16.4	144	.	12.80
1330	0.1	16.91	5.58	0.31	0.338	16.2	145	0.08	12.82

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks

Sampling Personnel J. O'BRIEN

ARCADIS

WATER SAMPLING LOG

Project No. GP08IIAFS.H01A.NAI TM

Site Location: HAA-001/DAACCG Area, HAAF

Rep./Field Blank No.

Weather Sunny, Warm

Date 2-3-2009

Monitoring Well Number COE-MW-01

Sample Collection Time 1100

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 20

Depth to water from top of casing 13.54

Water Column 6.46 (ft) Gallons in well 0.26

Evacuation Volume (x3) = 0.78

Casing stick-up above concrete (feet) 3.0

Screened Interval (ft bls) 15-20

Casing Diameter: 1"

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg L)	Cnnd. (µmhos cm)	Turb (NTU)	Redox (mV)	Flow (mL min)	Depth to Water (ft)
1053	0.75	.	5.09	0.00	433	21.6	-142	200	14.98
1058	1.00	18.49	5.16	0.00	330	18.1	-167	200	15.17
				JDF 2-3-09					

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 1036

Sampling Personnel JDF

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 2-3-09

Site Location: HAA-001/DAACCG Area, HAAF

Monitoring Well Number COE-MW-02

Rep./Field Blank No. ———

Sample Collection Time 1535

Weather Sunny, warm

Sampling Method Low Flow

Evacuation Data

Depth to bottom of well (ft bls) 19.9

Casing stick-up above concrete (feet) 3.0

Depth to water from top of casing 13.23

Screened Interval (ft bls) 14.9-19.9

Water Column 6.70 (ft) Gallons in well 0.27

Casing Diameter: 1

Evacuation Volume (x3) = 0.80

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1520	0.50	17.37	5.42	0.00	257	23.8	-83	200	15.57
1525	0.75	17.37	5.40	0.00	265	27.9	-94	200	15.61
1530	0.80	17.39	5.38	0.00	279	21.9	-101	200	15.73
				JDF					
					2-3-09				

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 1509, D.O. responds appropriately in open air

Sampling Personnel ———

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Site Location: HAA-001/DAACCG Area. HAAF

Rep./Field Blank No. —

Weather Sunny, warm

Date 2-3-2009

Monitoring Well Number COE-MW-03

Sample Collection Time ~~1410~~ 1410

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 20

Depth to water from top of casing 12.86

Water Column 7.14 (ft) Gallons in well 0.29

Evacuation Volume (x3) = 0.86

Casing stick-up above concrete (feet) 3.3

Screened Interval (ft bls) 15-20

Casing Diameter: 1

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (umhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1400	0.50	17.94	5.38	0.00	419	28.1	-78	300	18.06
1405	0.90	17.99	5.37	0.00	467	24.5	-90	240	17.82
1410	1.10	18.07	5.37	0.00	485	18.8	-98	240	17.86
				JDF	2-	-09			

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
8270? – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 1350, D.O. meter responds appropriately in open air

Sampling Personnel JDF

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Site Location: HAA-001/DAACCG Area, HAAF

Rep./Field Blank No. —

Weather Sunny, cold

Evacuation Data:

Depth to bottom of well (ft bls) 15

Depth to water from top of casing 5.67

Water Column 9.37 (ft) Gallons in well 6.37

Evacuation Volume (x3) = 1.12

Date 2-4-09

Monitoring Well Number COE-MW-04

Sample Collection Time 0825

Sampling Method —Low-Flow—

Casing stick-up above concrete (feet) 3

Screened Interval (ft bls) 10 - 15

Casing Diameter: 1

Casing Volume 1"=0.04 gal gal/ft. 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/l)	Cond. (umhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
0804	0.25	13.70	5.70	0.00	364	-36	28.5	200	6.59
0812	0.60	13.74	5.63	0.00	~~364~~ 564	-38	21.0	200	6.67
0817	0.80	13.46	5.61	0.00	388	-45	22.5	200	6.73
0822	1.10	13.77	5.61	0.00	281	-61		200	6.67
0824	1.20	13.74	5.61	0.	265	-65	18.7	200	6.68

2-4-09

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 0758

Sampling Personnel _____

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Site Location: HAA-001/DAACCG Area, HAAF

Rep./Field Blank No. ——

Weather Sunny, cold

Date 2-4-09

Monitoring Well Number COE-MW-05

Sample Collection Time 1005

Sampling Method Low-flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Depth to water from top of casing 5.06

Water Column 9.94 (ft) Gallons in well 0.40

Evacuation Volume (x3) = 1.20

Casing stick-up above concrete (feet) 3

Screened Interval (ft bls) 10-15

Casing Diameter: 1

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
0927	0.40	15.61	5.66	1.42	440	726	-22	200	6.14
~~0933~~ 0933	1.20	15.26	5.66	0.00	267	355	-57	200	6.70
0938	1.40	14.76	5.67	0.00	306	276	-76	200	6.53
0943	1.60	15.34	5.62	0.00	461	187	-82	200	6.68
0949	1.80	15.50	5.62	0.00	526	147	-84	200	6.96
~~0954~~ 0954	2.50	14.91	5.67	0.00	881	22.5	-91	200	6.72
1004	2.75	14.66	5.63	0.00	1,020	21.8	-93	200	6.71

Analyses

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 0919

Sampling Personnel JDF

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 3-4-09

Site Location: HAA-001/DAACCG Area, HAAF

Monitoring Well Number COE-MW-06

Rep./Field Blank No. ~~~~

Sample Collection Time 1116

Weather Sunny cold

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing \tick-up above concrete (feet) 3

Depth to water from tap of casing 5.72

Screened Interval (ft bls) 10-15

Water Column 9.28 (ft) Gallons in well 0.37

Casing Diameter: 1

Evacuation Volume (x 3) = 1.11

Casing Volume 1"=0.04 gal gal/ft. 2"=0.16 gal/ft

Field Parameters.

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (umhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1106	0.80	14.17	5.63	0.00	261	28.2	2	200	7.11
1106	1.20	14.63	5.64	0.00	273	20.1	-13	200	7.25
1111	1.60	15.04	5.64	0.00	258	16.5	-23	200	7.41
				JDF	2-4-09				

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 1046

Sampling Personnel JDF

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 2-4-09

Site Location: HAA-001/DAACCG Area, HAAF

Monitoring Well Number DAC-MW-07

Rep./Field Blank Nu. _____

Sample Collection Time 0900

Weather < ~ ~ ~26° F y

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) _____

Depth to a ater from top of casing 6.0

Screened Interval (ft blr) 10-15

Water Column 8.94ft) Gallons in well 6.4

Caring Diameter: 2"

Evacuation Volume (x) = _____

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg L)	Cond. (mmhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
0845	0.1	[illegible]	5.71	0.10	0.315	49.4	55	0.08	6.09
0850	0.1	13.91	5.74	0.13	0.261	0.5	0	0.08	6.11
0855	0	3.92	5.75	0.17	0.259	0.7	7	0.08	6.11
0900	0	13.94	5.75	0.16	0.257	0.5	7	0.08	6.14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
52707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks _____

Sampling Personnel J. OBRien

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Site Location: HAA-001/DAACCG Area, HAAF

Rep./Field Blank No.

Weather Sunny 26° F

Date 2-4-09

Monitoring Well Number 005 MW-CE

Sample Collection Time 0805

Sampling Method ~~Low-Flow~~

Evacuation Data:

Depth to bottom of well (ft bls) 15.-

Depth to water from top of casing 6.36

Water Column 8.64 (ft) Gallons in well 1.4

Evacuation Volume (x) =

Casing stick-up above concrete (feet)

Screened Interval (ft bls)

Casing Diameter: 1"

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (~~mmhos~~/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
750	0.1	7.66	5.34	0.62	0.934	14.9	139	0.08	6.38
0755	0.1	14.16	5.32	0.62	0.870	11.5	75	0.08	6.41
0800	0.1		3	0.64	0.873	11.6	75	0.08	6.42
0805	0.1	14.19	5.33	0.65	0.872	11.7	74	0.08	6.44

Analyses.

Analytical Parameter	Sample Bottles	Preservative
826013 – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks

Sampling Personnel

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Date 2-3-A?

Site Location: HAA-001/DAACCG Area, HAAF

Monitoring Well Number HMW-14R

Rep./Field Blank No. ~~Trip Blk 3~~

Sample Collection Time 0950

Weather cold

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 18.9

Casing stick-up above concrete (feet) 1.5

Depth to water from top of casing 12.78

Screened Interval (ft bls) 9.2 - 18.9

Water Column 6.12 (ft) Gallons in well 0.98

Casing Diameter: 2

Evacuation Volume (x 3) = 3

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (umhos cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
0838	1.25	19.18	4.93	1.08	3,750	19.4	57	200	13.30
	—	— purge paused —							
0920	1.75	16.22	4.89	0.00	816	11.8	60	200	13.09
0925	2.00	17.04	4.89	0.00	989	10.7	50	200	13.10
0930	~~2.25~~	17.32	4.93	0.00	2,320	11.9	36	200	13.08
0935	2.23	16.82	4.99	0.00	3,010	10.9	22	200	12.90
0940	2.50	18.15	4.97	0.00	2,350	16.9	33	200	13.20
0950	3.00	19.13	4.99	0.00	3,010	13.5	18	200	13.20

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 – SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 0818

Sampling Personnel JDF

C:\Documents and Settings\Jobrien\My Documents\Projects\HAAF_Ft Stewart\HAA 001 DAACH area SAMPLE LOGS.docx

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFS.H01A.NALTM

Site Location: HAA-001/DAACCG Area, HAAF

Rep./Field Blank No. —

Weather Sunny, cold

Date 2-4-09

Monitoring Well Number HMW-21

Sample Collection Time 1205

Sampling Method Low Flow

Evacuation Data.

Depth to bottom of well (ft bls) 11.5

Depth to water from top of casing 5.03

Water Column 6.02 (ft) Gallons in well 0.24

Evacuation Volume (x 3) = 0.72

Casing stick-up above concrete (feet) 3

Screened Intenal (ft bls) 2-11.5

Casing Diameter: 1

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Flow (mL/min)	Depth to Water (ft)
1149	~~0.30~~	12.36	6.01	0.10	990	32.8	104	200	5.39
1154	0.40	13.17	6.03	0.00	1,010	18.6	64	200	5.43
1159	0.70	13.16	6.03	0.00	1,000	14.2	-8	200	5.49
1204	0.90	13.27	6.04	0.00	1,000	12.8	-10	200	5.51
					JDF	2-4-09			

Analyses:

Analytical Parameter	Sample Bottles	Preservative
8260B – VOCs	40mL VOA vials	<4°C/HCl
82707 -- SVOCs	1 lt Amber Glass	<4°C
– Pesticides	1 lt Amber Glass	<4°C
– Herbicides	1 lt Amber Glass	<4°C
– Metal	500 ml Plastic	<4°C/Nitric Acid

Remarks Purge began 1144

Sampling Personnel JDF

Hunter Stewart
Water Levels

Water level Collection Form				
Well ID	Date	Time	Water Level (ft btoc)	Comments
HMW-02	2-2-09	1034	14.21	
HMW-04		1016	9.49	CUT TOP CASING RINGS DUST TIGHT
HMW-06		1021	9.13	CUT TOP CASING RINGS DUST TIGHT
HMW-08		1014	9.06	
HMW-09		1012	11.44	
HMW-10		1018	4.75	
HMW-11		1028	12.70	
HMW-13		1010	3.71	
HMW-23		1022	8.68	RUBBER CASING RINGS
HMW-24	↓	1025	9.28	
COE-MW-01	2-2-09	1406	13.41	
COE-MW-02		1400	13.15	
COE-MW-03		1405	12.81	
~~COE-MW-04~~		1357	5.53	
~~COE-MW-05~~		1355	4.75	
COE-MW-06		1353	5.62	
COE-MW-07		1345	6.06	
COE-MW-08		1347	6.29	
HMW-14		1409	12.70	
HMW-21	↓	1351	5.02	
35-MW-2	2-4-09	1522	12.63	wells not labled
35-MW-3		1518	13.00	
35-MW-4		1514	11.76	
35-MW-5	2	1511	12.92	
35-MW-6		1606	13.33	
35-MW-8		1609	13.90	
35-MW-12		1519	12.58	
35-MW-30		1559	12.31	
35-MW-31		1547	12.06	
35-MW-32		1614	12.23	
35-MW-34		1602	10.72	↓
35-MW-39		-	-	well destroyed
35-MW-40	↓	1524	13.09	
MW-1	2-4-09	1310	6.20	FST-24B

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	COE-MW-3
Date:	1/25/11	Sampled By:	C. Tisdale		
Sampling Time:	1330	Recorded By:	C. Tisdale		
Weather:	Cloudy, 50's	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	~~PID~~ YSI 556	Water Quality Meter(s) Lamotte 20/20e
Serial #:	09J101031	1589-0300

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2.0"	Screen Interval: From:	15.0 To: 20.0
Total Depth:	20.0'	Pump Intake Setting:	17.5
Depth to Water:	14.81	Volumes to be Purged:	Low-flow
Water Column:	5.19	Total Volume Purged:	1.50 gal
Gallons/Foot:	.16	Pump On:	1250 Off: 1325
Gallons in Well:	.85 gal		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss Oxygen	Comments
1300	10	140 ml/m	.25	15.06	12.6	5.34	291	16.89	69.6	2.89	
1305	15	140 ml/m	.50	15.08	8.74	5.34	296	17.66	40.2	1.65	
1310	20	140 ml/m	.75	15.07	7.68	5.36	297	17.75	28.3	2.62	
1315	25	140 ml/m	1.0	15.08	7.24	5.42	293	17.71	25.1	4.11	
1320	30	140 ml/m	1.25	15.08	6.84	5.43	292	17.69	22.5	4.59	
1325	35	140 ml/m	1.50	15.08	6.62	5.43	292	17.67	20.7	4.63	

C. Tisdale - 1/25/11

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	Clear	Turbidity(qualitative):	6.62
Odor:	None	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description: From Lab X ARCADIS	Preservative
Total + Diss. Iron, Arsenic, Magnesium		
Nitrate, Nitrite		
Chloride, Sulfate, Sulfide,		
Methane, Ethane, Ethene		
TOC		
Alkalinity/Acidity		
Total Diss. Solids		

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

HAA-01

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	COE MW-05
Date:	1/26/11	Sampled By:	SSchmid		
Sampling Time:	935	Recorded By:	SSchmid		
Weather:	Sunny ~40°F	Duplicate/QA/QC:	none		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	YSI 556	Lamotte 2020
Serial #:	10C101181	5295-3504

Purging Information

Casing Material: PVC
Casing Diameter: 1.5"
Total Depth: 17.2
Depth to Water: 8.62
Water Column: 8.58
Gallons/Foot: 0.09
Gallons in Well: 0.77

Purge Method: (circle one) Submersible Centrifugal Bladder Baller (Peristaltic)
Screen Interval: From: 12.2 To: 17.2
Pump Intake Setting: ~14 ft btoc
Volumes to be Purged: low flow / low vol
Total Volume Purged: 2.5 gal
Pump On: 835 Off: 925

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
840	5	105	525	9.53	94.3	5.28	287	16.17	171.7	1.29	tubing in top of water column for low flow purge
845	10	200	1525	9.60	76.7	5.29	268	16.24	153.0	0.95	
850	15	200	2525	9.70	65.3	5.28	255	16.50	50.7	0.80	
855	20	200	3525	9.90	60.7	5.28	250	16.55	-10.7	0.60	
900	25	200	4525	9.97	51.3	5.28	242	16.56	-21.5	0.56	
905	30	200	5525	10.01	21.9	5.29	238	16.62	-39.9	0.46	
910	35	200	6525	10.06	10.40	5.29	232	16.72	-49.7	0.45	
915	40	200	7525	10.08	8.57	5.29	232	16.77	-57.7	0.42	
920	45	200	8525	10.08	4.39	5.29	231	16.68	-58.3	0.38	
925	50	200	9525	10.09	3.01	5.29	231	16.72	-58.9	0.33	

Observations During Sampling

Well Condition: good
Color: none
Odor: light

Purge Water Disposal: IDW drum
Turbidity(qualitative): clear w/ yellow specles (Pollen/mold/bug/100 king)
Other (OVA, HNU,etc.): NA

Constituents Sampled	Container Description: From Lab X / ARCADIS	Preservative
VOCs	3 - 40ml VOA	HCl
M&E	2 - 40 ml VOA	BAIC
N+N	500 ml plastic	H_2SO_4
Sulfide	"	NaOH/ZN
Total / Diss metals	"	HNO_3 / none
Sulfate, Cl, Alk	"	none
TDS	"	"
TOC	250 ml plastic	H_2SO_4
Acidity	"	none

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA01 COE-MW-7
Date:	1/26/11	Sampled By:	Sturgis Schmid		
Sampling Time:	1310	Recorded By:	Sturgis Schmid		
Weather:	cloudy ~55°F	Duplicate/QA/QC:	none		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	YSI556 10C101181	LaMotte 2020 5295.3504

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	1.25"	Screen Interval: From:	12.58 To: 17.58
Total Depth:	17.58	Pump Intake Setting:	15.5 ft + 6 to c
Depth to Water:	9.00	Volumes to be Purged:	low flow → 3WV
Water Column:	8.58	Total Volume Purged:	2.4 gal
Gallons/Foot:	~0.09	Pump On:	1220 Off: 1300
Gallons in Well:	0.77		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or (ml))	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1226	5	80	400	9.82	186	5.14	296	14.83	23.7	2.21	move pump intake to top of water column, pump method 3WV
1230	10	250	1650	10.39	122	5.16	265	16.26	264	0.52	
1235	15	250	2900	10.40	79.8	5.17	250	16.39	250	0.42	
1240	20	250	4150	10.48	55.7	5.19	240	16.51	-10.4	0.37	
1245	25	250	5400	10.49	13.4	5.20	238	16.70	-89.9	0.32	
1250	30	250	6650	10.50	9.43	5.20	234	16.49	-94.3	0.30	
1255	35	250	7900	10.50	2.31	5.21	230	16.61	-97.4	0.30	
1300	40	250	9150	10.50	3.16	5.21	228	16.52	-101.6	0.29	

Observations During Sampling

Well Condition:	good	Purge Water Disposal:	10w drum
Color:	none	Turbidity(qualitative):	clear
Odor:	none	Other (OVA, HNU,etc.):	NA

Constituents Sampled	Container Description From Lab X ARCADIS	Preservative
VOCs	3 · 40ml VOA	HCl
MEE	2 · "	BAR
N+N	500ml plastic	H_2SO_4
Sulfide	"	NaOH/ZN
Total Metals	"	HNO_3
Diss "	"	none
Sulfate, Cl, Alk	"	"
TDS	"	"
TOC	250 ml plastic	H_2SO_4
Acidity	4	none

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

HAA01

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	COE-MW-8
Date:	1/26/11	Sampled By:	Sheryl Schmid		
Sampling Time:	1200	Recorded By:	Sheryl Schmid		
Weather:	cloudy ~ 60°F	Duplicate/QA/QC:	none		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	YSI 556	La motte 2020
Serial #:	10C101181	5295-3504

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	1.25"	Screen Interval: From:	12.85 To: 17.85
Total Depth:	17.85	Pump Intake Setting:	15.5 ft btoc
Depth to Water:	10.81	Volumes to be Purged:	low flow → 3wv = 1.9 gal
Water Column:	7.04	Total Volume Purged:	
Gallons/Foot:	0.9	Pump On:	1115 Off: 1150
Gallons in Well:	0.63		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1120	5	90	450	11.94	64.6	4.79	1056	15.53	120.3	1.51	change purge method to low flow - move intake to top of watercolumn
1125	10	330	2100	11.99	50.9	4.88	1050	16.33	70.7	0.76	
1130	15	330	3750	12.03	42.4	4.90	1088	16.68	55.1	0.48	
1135	20	330	5400	12.05	20.1	4.99	1027	17.04	-8.0	0.32	
1140	25	330	7050	12.09	10.13	5.00	1024	17.01	-12.8	0.30	
1145	30	330	8700	12.12	4.26	5.00	1012	16.98	-20.0	6.29	
1150	35	330	10350	12.13	2.24	5.01	1008	16.90	-26.9	0.28	

Observations During Sampling

Well Condition:	good	Purge Water Disposal:	low drum
Color:	none	Turbidity(qualitative):	foggy
Odor:		Other (OVA, HNU,etc.):	NA

Constituents Sampled	Container Description: From Lab ☒ ARCADIS ☐	Preservative
VOCs	3-40ml VOA	HCl
MEE	2- "	BAK
N+N	500 ml plastic	H_2SO_4
Sulfide	"	NaOH/ZN
Total Metals	"	HNO_3
Diss "	"	none
Sulfate, Cl, Alk	"	"
TDS	"	"
TOC	250 ml plastic	H_2SO_4
Acidity	"	none

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HAA01 - MW-10
Date:	1/25/11	Sampled By:	C. Tisdale		
Sampling Time:	1210	Recorded By:	C. Tisdale		
Weather:	Cloudy, Lt Rain	Duplicate/QA/QC:	N/A		

Instrument Identification

Instrument:	~~PID~~ YSI 556	Water Quality Meter(s)
		LaMotte 20/20e
Serial #:	09J101031	1589 - 0300

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible	Centrifugal	Bladder / Bailer / (Peristaltic)
Casing Diameter:	2.0"	Screen Interval: From:	2.0	To:	12.0
Total Depth:	12.0'	Pump Intake Setting:	10.0		
Depth to Water:	8.02	Volumes to be Purged:	Low-flow		
Water Column:	3.98'	Total Volume Purged:	1.75 gal		
Gallons/Foot:	.16	Pump On:	1120	Off:	1205
Gallons in Well:	≈.75 gal				

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1130	10	130 ml/m	.25	8.26	11.4	4.08	364	15.63	366.4	6.93	
1135	15	130 ml/m	.25	8.26	10.3	4.37	342	16.34	376.2	4.71	
1140	20	130 ml/m	.50	8.27	9.12	4.37	339	16.48	377.5	4.33	
1145	25	130 ml/m	.75	8.27	8.36	4.37	336	16.26	375.3	4.03	
1150	30	130 ml/m	1.0	8.26	7.26	4.37	333	16.02	373.1	4.22	
1155	35	130 ml/m	1.25	8.28	6.73	4.41	336	16.72	357.0	3.11	
1200	40	130 ml/m	1.50	8.28	6.41	4.41	338	16.75	356.0	3.03	
1205	45	130 ml/m	1.75	8.28	6.09	4.41	338	16.70	355.0	2.95	

C. Tisdale - 1/25/11

Observations During Sampling

Well Condition:	Good	Purge Water Disposal:	Drum
Color:	clear	Turbidity(qualitative):	6.09
Odor:	None	Other (OVA, HNU,etc.):	N/A

Constituents Sampled	Container Description: From Lab X ARCADIS	Preservative
Total + Diss. - Iron, Arsenic, Manganese		
Nitrate, Nitrite		
Chloride, Sulfate, Sulfide,		

Boring/Casing Volumes
2" = 0.16 4" = 0.65

Methane, Ethane, Ethene
TOC
Alkalinity / Acidity
Total Dissolved solids

ARCADIS

Groundwater Sampling Form

Site Location: Fort Stewart/HAAF | Project No. GP08HAFS | Well ID: HAA01-MW 15
Date: 1/25/11 | Sampled By: Shengli Schmid
Sampling Time: 1520 | Recorded By: Shengli Schmid
Weather: heavy rain ~50 F | Duplicate/QA/QC: None

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	YSI 556	Lamotte 2020
Serial #:	10C101181	

Purging Information

Casing Material: PVC
Casing Diameter: 2"
Total Depth: 14.5
Depth to Water: 12.28
Water Column: 2.22
Gallons/Foot: 0.16
Gallons in Well: 0.355

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer (Peristaltic)
Screen Interval: From: 4.5 To: 14.5
Pump Intake Setting: 13.5
Volumes to be Purged: low volume low flow
Total Volume Purged: 1.8 gal
Pump On: 1420 Off: 1512

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1425	5	140	700	12.38	35.3	5.44	162	16.03	-36.4	2.54	
1430	10	140	1400	12.42	28.7	5.43	166	16.67	-94.1	0.89	
1435	15	140	2100	12.45	25.9	5.41	169	16.62	-116.5	0.69	
1440	20	140	2800	12.45	11.6	5.40	171	16.76	-120.0	0.71	
1445	25	140	3500	12.45	9.56	5.39	172	16.57	-127.3	0.80	
1450	30	140	4200	12.46	8.22	5.39	173	16.63	-124.3	0.82	
1455	35	140	4900	12.46	7.93	5.37	172	16.55	-124.7	0.88	
1500	40	140	5600	12.46	4.87	5.37	172	16.44	-124.5	0.90	
1505	45	140	6300	12.46	5.12	5.37	170	16.23	-121.5	0.93	
1510	50	140	7000	12.46	4.93	5.36	169	16.25	-127.2	0.94	

Observations During Sampling

Well Condition: good
Color: none
Odor: slight

Purge Water Disposal: low drum
Turbidity(qualitative): clear
Other (OVA, HNU,etc.): N.A

Constituents Sampled	Container Description From Lab X ARCADIS	Preservative
VOCs	3 40ml VOA	HCl
MEE	2 "	BAK
N+N	500 ml plastic	H_2SO_4
Sulfide	"	NaOH/ZnA
Total Metals	"	HNO_3
Diss Metals	"	none
Sulfate, Cl, Alk	"	"
TDS	"	"
TOC	250 ml plastic	H_2SO_4
Acidity	"	none

Boring/Casing Volumes
2" = 0.16 4" = 0.65

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HMW-9
Date:	11/25/11	Sampled By:	Sheryl Schmid		
Sampling Time:	1145	Recorded By:	Sheryl Schmid		
Weather:	lt rain ~50 F	Duplicate/QA/QC:	none		

Instrument Identification

Instrument:	YSI 556 PID	Water Quality Meter(s)
		Lamotte 2020
Serial #:	10C101181	

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	5 To: 15
Total Depth:	17.5 tagged	Pump Intake Setting:	14 initial - move to top of water column for 3wv
Depth to Water:	13.12	Volumes to be Purged:	low flow → 3wv
Water Column:	4.38	Total Volume Purged:	1.7gal - dry
Gallons/Foot:	0.16	Pump On:	1040 Off: 1137
Gallons in Well:	0.7		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or (ml))	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C) or °F)	ORP (mV)	Diss. Oxygen	Comments
1045	5	111	555	13.25	45.3	5.98	619	17.10	-66.1	1.04	
1050	10	111	1110	13.47	20.8	6.01	600	17.19	-68.0	0.85	
1055	15	111	1665	13.95	18.7	6.03	584	17.23	-70.2	0.73	
1100	20	111	2200	14.31	13.5	6.03	579	17.25	-71.1	0.71	switch to 3wv
1105	25	170	3050	14.95	22.0	6.02	573	17.29	-85.5	0.63	
1110	30	170	3900	15.57	18.9	6.04	560	18.06	-92.1	0.55	
1115	35	170	4750	16.91	25.8	6.07	554	18.78	-106.6	0.40	
1120	40	170	5600	17.20	22.4	6.04	507	18.85	-108.8	0.36	dry - off to recharge
1135	45	170	6450	16.95	20.5	6.05	473	18.90	-107.8	0.44	on 1120, dry 1137
											let recharge before sampling

Observations During Sampling

Well Condition:	No well id, lid mark	Purge Water Disposal:	1 Owdrum
Color:	none	Turbidity(qualitative):	clear
Odor:	none	Other (OVA, HNU,etc.):	n/a

Constituents Sampled	Container Description From Lab X ARCADIS	Preservative
VOCs	40 ml VOA	HCl
Sulfide	500 ml plastic	NaOH 1:2N
NH3N	500 ml plastic	H_2SO_4
total metals	"	HNO_3

Boring/Casing Volumes

2" = 0.16 4" = 0.65

MEE — 40 ml VOA — BAK

Diss metals — 500ml plastic — none

Sulfate, Cl, Alk — 500ml plastic — none

TOC — 250 ml plastic — H_2SO_4

Acidity — 250 ml plastic — none

TDS — 500 ml plastic — none

ARCADIS

Groundwater Sampling Form

Site Location:	Fort Stewart/HAAF	Project No.	GP08HAFS	Well ID:	HMW-13
Date:	1/25/11	Sampled By:	Sheryl Schmid		
Sampling Time:	13 25	Recorded By:	Sheryl Schmid		
Weather:	lt rain ~50°F	Duplicate/QA/QC:	none		

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
	US1556	Lamotte 2020
Serial #:	10C101181	

Purging Information

Casing Material:	PVC	Purge Method: (circle one)	Submersible Centrifugal Bladder Bailer (Peristaltic)
Casing Diameter:	2"	Screen Interval: From:	7.5 To: 17.6
Total Depth:	17.6	Pump Intake Setting:	16 ft btoc
Depth to Water:	14.51	Volumes to be Purged:	low flow low vol
Water Column:	3.09	Total Volume Purged:	2.5 gal
Gallons/Foot:	0.16	Pump On:	1250 Off: 1348
Gallons in Well:	0.49		

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1255	5	170	850	14.63	4.52	5.92	320	18.09	-87.3	0.65	
1300	10	170	1700	14.70	2.68	5.92	319	17.98	-90.0	0.66	
1305	15	170	2550	14.73	3.77	5.91	318	17.95	-89.3	0.55	
1310	20	170	3400	14.74	3.02	5.92	317	18.02	-89.4	0.51	
1315	25	170	4250	14.74	2.14	5.91	317	18.11	-102.8	0.46	
1320	30	170	5100	14.75	2.97	5.91	317	18.11	-94.6	0.47	
1325	35	170	5950	14.75	3.04	5.91	318	18.28	-93.2	0.45	
1330	40	170	6800	14.75	1.88	5.91	319	18.49	-104.5	0.41	
1335	45	170	7650	14.75	1.92	5.91	319	18.49	-102.5	0.36	
1340	50	170	8500	14.75	2.76	5.91	320	18.50	-106.1	0.35	
1345	55	170	9350	14.75	2.04	5.91	320	18.52	-100.2	0.55	

Observations During Sampling

Well Condition:	no id	Purge Water Disposal:	1 DW drum
Color:	none	Turbidity(qualitative):	clear
Odor:		Other (OVA, HNU,etc.):	N.A

Constituents Sampled	Container Description From Lab X ARCADIS	Preservative
VOCs	3- 40ml VOA	HCl
NH4	500ml plastic	H_2SO_4
sulfide	500ml plastic	NaOH 12N
Total metals	"	HNO_3

Boring/Casing Volumes

2" = 0.16 4" = 0.65

Dissolved metals — 500ml plastic — none

MEE — 2- 40ml VOA — BAK

Sulfate, Cl, Alk — 500ml plastic — none

TOC — 250ml plastic — H_2SO_4

Acidity — 250ml plastic — none

TDS — 500ml plastic — none

ARCADIS

Groundwater Sampling Form

HAA01

Site Location: Fort Stewart/HAAF | Project No. GP08HAFS | Well ID: HMW-21

Date: 1/26/11 | Sampled By: Sheryl Schmid

Sampling Time: 1150 | Recorded By: Sheryl Schmid

Weather: cloudy ~60°F | Duplicate/QA/QC: none

Instrument Identification

Instrument:	PID	Water Quality Meter(s)
Serial #:	10C101181	Lamotte 2020 5295.3504

Purging Information

Casing Material: PVC

Casing Diameter: 2"

Total Depth: 15.12

Depth to Water: 8.18

Water Column: 6.94

Gallons/Foot: 0.16

Gallons in Well: 1.11

Purge Method: (circle one) Submersible Centrifugal Bladder Bailer (Peristaltic)

Screen Interval: From: 6.62 To: 15.12

Pump Intake Setting: ~11 ft. btoc

Volumes to be Purged: low flow → 3wv = 3.33

Total Volume Purged: 3.4 gal

Pump On: 955 Off: 1050

Field Parameter Measurements During Purging

Time	Minutes Elapsed	Rate (gpm or ml)	Volume Purged	Depth to Water	Turbidity (NTUs)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C or °F)	ORP (mV)	Diss. Oxygen	Comments
1000	5	80	500	8.57	146	5.33	166	15.39	41.0	1.06	off for ~1 min WL = 8.58
1005	10	250	1750	8.72	122	5.34	167	15.65	27.5	0.91	reduce flow RO → to top of screen 20
1010	15	250	3000	8.84	36.8	5.33	167	16.04	8.0	0.63	
1015	20	250	4250	8.93	24.2	5.33	168	16.33	-23.7	0.54	
1020	25	250	5500	9.01	20.1	5.33	169	16.39	-34.3	0.48	
1025	30	250	6750	9.04	17.9	5.33	169	16.44	-45.4	0.44	
1030	35	250	8000	9.15	15.4	5.33	170	16.48	-52.7	0.38	
1035	40	250	9250	9.20	14.7	5.33	170	16.50	-59.4	0.37	
1040	45	250	10500	9.20	10.12	5.34	170	16.52	-60.9	0.36	
1045	50	250	11750	9.20	8.34	5.34	169	16.48	-65.7	0.36	
1050	55	250	13000	9.21	5.79	5.34	169	16.46	-71.4	0.32	

Observations During Sampling

Well Condition: good

Color: none

Odor: none

Purge Water Disposal: IDW drum

Turbidity(qualitative): clear w/ pollen/moldy yellow specks

Other (OVA, HNU,etc.): NA

Constituents Sampled	Container Description: From Lab X ARCADIS	Preservative
VOCs	3-40ml VOA	HCl
mee	2- "	BAK
N+N	500ml plastic	H_2SO_4
Sulfide	"	NaOH/ZN
Total Metals	"	HNO_3
Diss "	"	none
sulfate, Cl, Alk	"	"
TDS	"	"
TOC	250ml plastic	H_2SO_4
Acidity	"	none

Boring/Casing Volumes

2" = 0.16 4" = 0.65

ARCADIS

WATER SAMPLING LOG

Project No. GP08HFS. H01C

Date 1/30/12

Site Location: Hunter Army Airfield

Monitoring Well Number HA01-MW-12

Rep./Field Blank No.

Sample Collection Time 1340

Weather Sunny, 60's

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 16.2

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 12.2

Screened Interval (ft bls)

Water Column 3 (ft) Gallons in well 0.48

Casing Diameter: 2"

Evacuation Volume (x 3) = 1.44

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1328	0	19.12	5.20	1.26	0.529	114	93.6	—
1330	0.25	18.71	4.67	0.78	0.442	22.4	114.0	—
1332	0.50	18.68	4.85	0.62	0.424	13.4	120.3	—
1334	.75	18.71	5.05	0.53	0.389	~~9.36~~ 7.5	77.5	—
1336	1.00	~~18.98~~	5.11	~~2.55~~ 0.50	0.372	6.19	69.6	—
1338	1.25	19.35	5.13	0.49	0.371	5.30	65.3	—

VP 1-30-12

Analyses:

Analytical Parameter	Sample Bottles	Preservative

Remarks

Sampling Personnel Valyn Paouncic

ARCADIS

WATER SAMPLING LOG

Project No. GP08HAFB. HOIC

Date 1-30-12

Site Location: Hunter Army Airfield

Monitoring Well Number HA1 - MW-14

Rep./Field Blank No.

Sample Collection Time 1440

Weather Sunny, 60's

Sampling Method

Evacuation Data:

Depth to bottom of well (ft bls) 14.5

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 13.2

Screened Interval (ft bls)

Water Column 1.3 (ft) Gallons in well 0.208

Casing Diameter: 2"

Evacuation Volume (x 3) = ~~1.0~~ 0.624

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1422	.5	19.83	4.51	2.97	0.254	—	124.5	—
1427	1.0	19.46	3.67	7.04	0.275	—	164.4	—
		DRY	@	1.0	gallon			

Analyses:

Analytical Parameter	Sample Bottles	Preservative

Remarks

Sampling Personnel Valya Paouncic

ARCADIS

WATER SAMPLING LOG

Project No. GPOHAFS, HOIC

Date 2-16-12

Site Location: HUNTER ARMY AIRFIELD

Monitoring Well Number HOI-MW-7D

Rep./Field Blank No. _____

Sample Collection Time _____

Weather Sunny, Low 70's Humid

Sampling Method Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 60.0'

Depth to water from top of casing 6.81

Water Column 53.2 (ft) Gallons in well 8.51

Evacuation Volume (x 3) = 25.54

Casing stick-up above concrete (feet) ~~2~~ 3'

Screened Interval (ft bls) ~~50~~ - 60'

Casing Diameter: 2" inner casing

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1530	0.25	23.08	8.15	5.74	619	-	27.5	—
1535	0.25	22.57	8.19	2.31	627	—	57.6	—
1540	~~0.25~~ 0.5	22.10	8.41	2.09	~~624~~ 601	—	-10.9	—
1545	~~0.25~~ 0.75	21.98	8.23	1.70	549	—	-41.8	—
1550	0.5	21.57	8.19	1.68	537	—	-50.1	—
1555	~~0.75~~ 0.75	21.94	8.20	1.70	538	—	-31.2	—

2-16-12

Analyses:

Analytical Parameter	Sample Bottles	Preservative

Remarks DO NOT HAVE TURBIDIMETER

Sampling Personnel Valyn Paouncic

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Well: H01-MW-7D | Project/No.: GP08HAFS.H01C | Page: 1 of 1

Site Location: Hunter Army Airfield, Savannah, GA | Drilling Started: 2/9/2012 | Drilling Completed: 2/15/2012

Drilling Contractor: Parratt Wolff, Inc. | Driller: Joshua Ellingworth | Helper: James Terry

Drilling Fluid Used: Mud (inner casing) | Drilling Method: Geoprobe 7822 DT (outer casing), Mud Rotary (inner casing)

Length and Diameter of Coring Device: 4', 2" | Sampling Interval: 4'(geoprobe), 2' (split spoons) feet

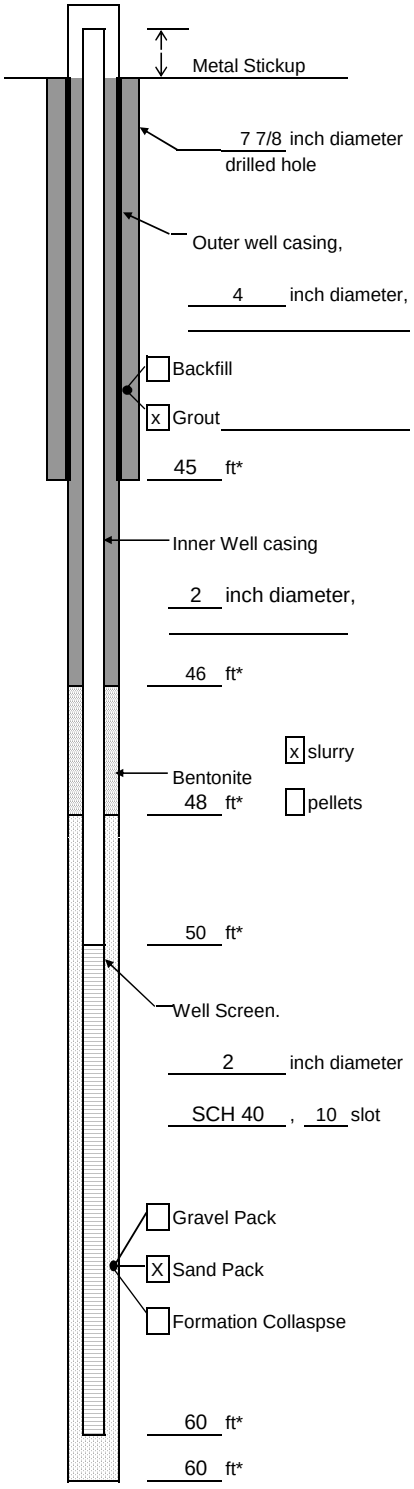
Total Depth Drilled: 60 Feet | Hole Diameter: 4", 2" | Coring Device: Geoprobe 7822DT, Truck Mounted CME

Prepared By: Valyn Paouncic | Hammer Weight: | Hammer Drop: ins.

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Sample/Core Description
0	8	Hand Augured
8	12	(4.0' recovery) wet, gray/blue, medium grained sand, very soft
12	16	(4.0' recovery) wet, gray/blue, fine grained sand, very soft
16	20	(4.0' recovery) wet, gray/blue, fine grained sand, trace clay, very soft
20	24	(4.0' recovery) wet, gray/blue, fine grained sand, little clay, very soft
24	28	(4.0' recovery) wet, gray/blue, clay and fine grained sand, little clay, very soft
28	32	(3.0' recovery) wet gray/blue, medium grained sand and poorly sorted, subrounded pebbles
32	36	(4.0' recovery) wet, gray, course grained sand, trace poorly sorted, subrounded pebbles
36	40	(4.0' recovery) wet, gray/blue, course grained sand, trace poorly sorted, subrounded granule (39.2'-40.0')
40	44	(4.0' recovery) wet, dark gray, clay, stiff
		Began Split Spoons
48	50	(2.0' recovery) wet, gray, course grained sand and subrounded poorly sorted pebbles, loose
53	55	(2.0' recovery) moist, dark green, very fine sandy silt, nonplastic, hard
58	60	(2.0' recovery) moist, dark green, very fine grained sand and clay, low plasticity, hard

WELL CONSTRUCTION LOG- TELESCOPING



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01C Well H01-MW-7D

Town/City Savannah

County Chatham State GA

Installation Date(s) 2-9-2012 thru 2-15-2012

Drilling Method Mud Rotary

Drilling Contractor Parratt Wolff, Inc.

Drilling Fluid Bentonite Drilling Mud

Development Technique(s) and Date(s)

Developed 2-16-2012 using electric submersible pump and surge block

Water Removed During Development 80 gallons

Static Depth to Water 6.8' feet below M.P.

Well Purpose Monitoring Well

Remarks

Prepared by Valyn Paouncic

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Well H01-BSP-01 Project/No. GP08HAFS.H01C Page 1 of 1

Site Location Hunter Army Airfield -Savannh, GA Drilling Started 2/6/2012 Drilling Completed 2/7/2012

Drilling Contractor Parratt Wolff, Inc. Driller Joshua Ellingworth Helper James Terry

Drilling Fluid Used Drilling Method Geoprobe 7822 DT

Length and Diameter of Coring Device 4', 2" Sampling Interval 4 feet

Total Depth Drilled 27 Feet Hole Diameter 2" Coring Device Geoprobe 7822 DT

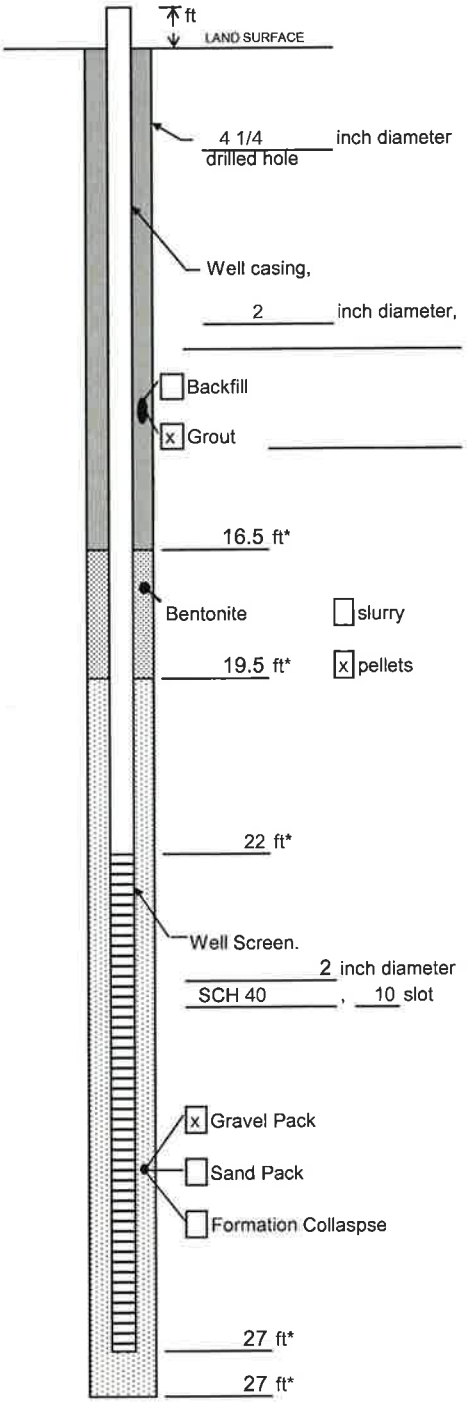
Prepared By Valyn Paouncic Hammer Weight Hammer Drop ins.

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Sample/Core Description
0	7	Hand Augered
7	10	(3.0' recovery) 7'-7.6' moist, tan, fine grained sand; 7.6'-9.8' wet, tan, orange and brown wood; 9.8'-10' moist, dark brownish black, fine grained sand, medium stiff
10	12	(1.0' recovery) moist, dark brownish black and white, very fine sand, medium stiff
12	16	(3.0' recovery) wet, dark brown (1.5') to tanish gray (1.5'), very fine grained sand, soft
16	20	(4.0' recovery) wet, gray, very fine sand, trace clay throughout, medium stiff
20	24	(3.5' recovery) wet, gray, fine grained sand, soft
24	27	(1.5' recovery) wet, gray, fine grained sand, soft

ARCADIS

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01C Well HA01-BSP-01

Town/City Savannah

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

_____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) 2/7/2012

Drilling Method 4 1/4" Hollow Stem Augers, Geoprobe 7822 DT

Drilling Contractor Parratt Wolff, Inc.

Drilling Fluid

Development Technique(s) and Date(s)

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Injection well

Remarks Gravel pack is # 2 sand

Prepared by Valyn Paouncic

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Well H01-OW-01 Project/No. GP08HAFS.H01C Page 1 of 1

Site Location Hunter Army Airfield, Savannah, GA Drilling Started 2/8/2012 Drilling Completed 2/8/2012

Drilling Contractor Parratt Wolff, Inc. Driller Joshua Ellingworth Helper James Terry

Drilling Fluid Used Drilling Method Geoprobe 7822 DT

Length and Diameter of Coring Device 4', 2" Sampling Interval 4 feet

Total Depth Drilled 27 Feet Hole Diameter 2" Coring Device Geoprobe 7822 DT

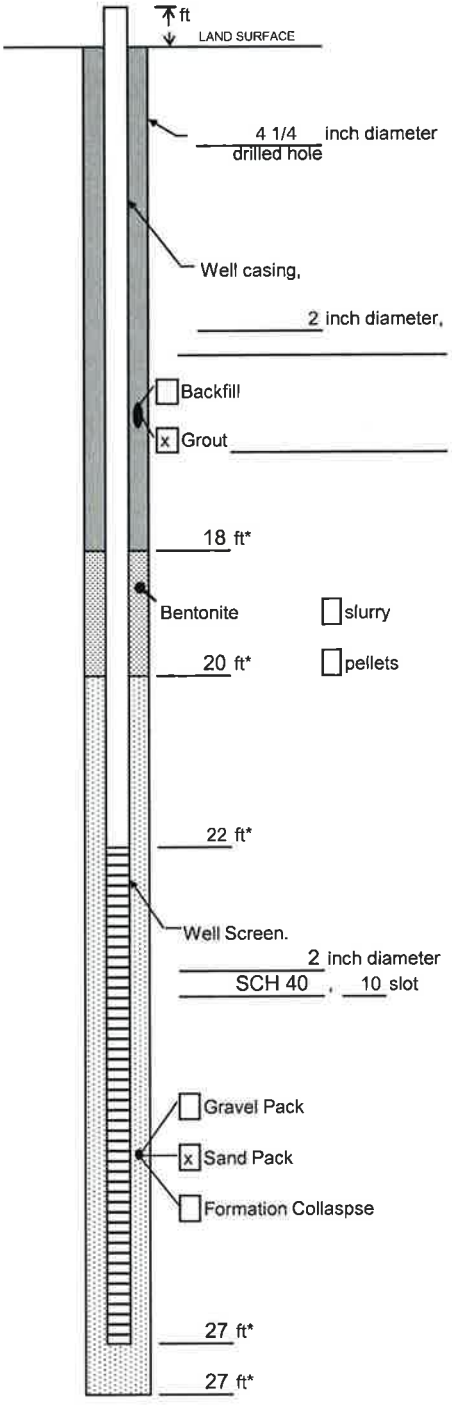
Prepared By Valyn Paouncic Hammer Weight Hammer Drop ins.

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Sample/Core Description
0	8	Hand Augured
8	12	(4.0' recovery) moist to wet, dark brown/black and white, fine grained sand, soft
12	16	(3.0' recovery) wet, dark brown (2'), fine grained sand, med. Stiff; wet, gray/blue (1'), very fine grained sand - trace clay, stiff
16	20	(4.0' recovery) wet, gray/blue, fine grained to medium grained sand, trace clay, medium stiff
20	24	(4.0' recovery) wet, gray/blue, medium grained sand, medium stiff
24	27	(0.5' recovery) wet, gray/blue, medium grained sand, loose

ARCADIS

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01C Well HA01-OW-01

Town/City Savannah

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

_____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) 2/8/2012

Drilling Method 4 1/4" Hollow Stem Augers, Geoprobe 7822 DT

Drilling Contractor Parratt Wolff, Inc.

Drilling Fluid

Development Technique(s) and Date(s)

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Observation Well

Remarks pre-packed sand pack #1

Prepared by Valyn Paouncic

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Well H01-OW-02 Project/No. GP08HAFS.H01C Page 1 of 1

Site Location Hunter Army Airfield, Savannah, GA Drilling Started 2/7/2012 Drilling Completed 2/7/2012

Drilling Contractor Parratt Wolff, Inc. Driller Joshua Ellingworth Helper James Terry

Drilling Fluid Used Drilling Method Geoprobe 7822 DT

Length and Diameter of Coring Device 4', 2" Sampling Interval 4 feet

Total Depth Drilled 27 Feet Hole Diameter 2" Coring Device Geoprobe 7822 DT

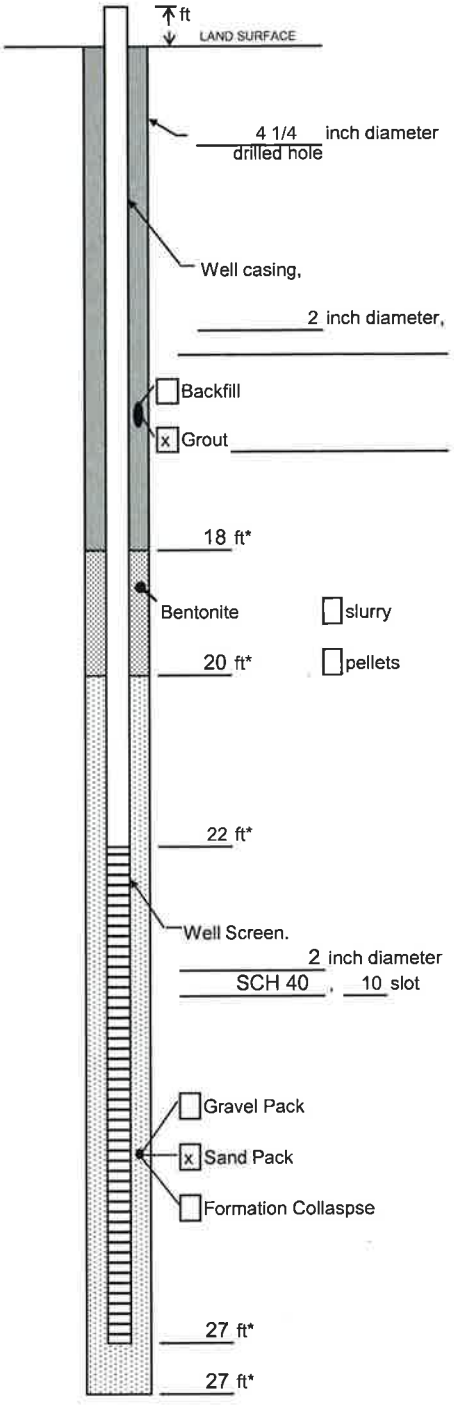
Prepared By Valyn Paouncic Hammer Weight Hammer Drop ins.

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Sample/Core Description
0	8	Hand Augered
8	12	(3.0' recovery) 8'-9.5' moist, tan, fine grained sand; 9.5-11.5 moist, black and white/gray, fine grained sand, trace wood fragments; 11.5' -12' wet, tan, wood fragments, soft
12	16	(2.8' recovery) wet, dark brown/blackish, fine grained sand, trace clay (1.5'), wet, tan, fine grained sand, medium stiff (1.3')
16	20	(4.0' recovery) wet, tan, very fine grained sand/silt and clay (1.2'), wet, gray/blue, very fine grained sand, medium stiff (2.8')
20	24	(2.0' recovery) wet, fine grained, gray/blue sand, medium stiff
24	27	(3.5' recovery) wet, gray, medium grained sand, soft

ARCADIS

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01C Well HA01-OW-02

Town/City Savannah

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

_____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) 2/7/2012

Drilling Method 4 1/4" Hollow Stem Augers, Geoprobe 7822 DT

Drilling Contractor Parratt Wolff, Inc.

Drilling Fluid

Development Technique(s) and Date(s)

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Observation Well

Remarks pre-packed sand pack #1

Prepared by Valyn Paouncic

ARCADIS

SOIL CORE / SAMPLING LOG

Boring/Well H01-OW-03 Project/No. GP08HAFS.H01C Page 1 of 1

Site Location Hunter Army Airfield, Savannah, GA Drilling Started 2/7/2012 Drilling Completed 2/7/2012

Drilling Contractor Parratt Wolff, Inc. Driller Joshua Ellingworth Helper James Terry

Drilling Fluid Used Drilling Method Geoprobe 7822 DT

Length and Diameter of Coring Device 4', 2" Sampling Interval 4' feet

Total Depth Drilled 27 Feet Hole Diameter Coring Device Geoprobe 7822 DT

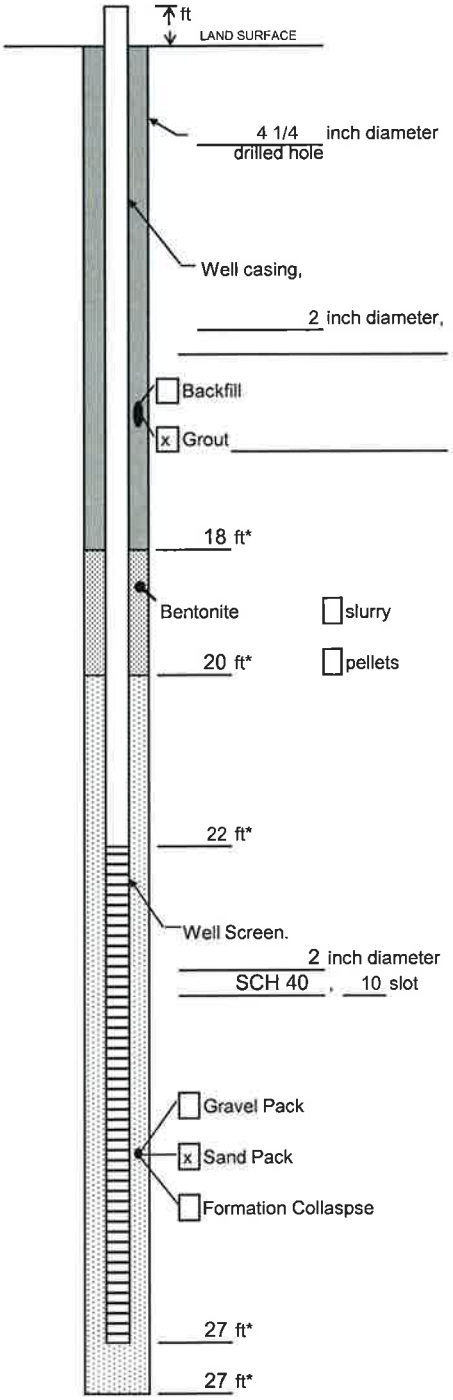
Prepared By Valyn Paouncic Hammer Weight Hammer Drop ins.

Soil Characterization:

Sample/Core Depth (Feet bls) From	To	Sample/Core Description
0	8	Hand Augured
8	12	(4.0' recovery) moist, tan (1.2') to black and white (2.8'), fine grained sand and trace clay, soft
12	16	(3.3' recovery) wet, dark brown and tan (2.8') to light tan (0.5') , very fine grained sand, stiff
16	20	(2.8' recovery) wet, tan and gray, very fine grained sand and little clay, soft
20	24	(4.0' recovery) wet, gray, medium grained sand, soft
24	27	(3.0' recovery) wet, gray, medium grained sand, medium stiff

ARCADIS

WELL CONSTRUCTION LOG- UNCONSOLIDATED



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project GP08HAFS.H01C Well H01-OW-03

Town/City Savannah

County Chatham State GA

Permit No.

Land-Surface Elevation and Datum:

_____ feet ☐ Surveyed

☐ Estimated

Installation Date(s) 2/8/2012

Drilling Method 4 1/4" Hollow Stem Augers, Geoprobe 7822 DT

Drilling Contractor Parratt Wolff, Inc.

Drilling Fluid

Development Technique(s) and Date(s)

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Observation Well

Remarks pre-packed sand pack #1

Prepared by Valyn Paouncic

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/22/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number COE-MW-01

Rep./Field Blank No. —

Sample Collection Time 1611

Weather 55°F Rainy

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 20

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 14.98

Screened Interval (ft bls) 15-20

Water Column ___ (ft) Gallons in well ___

Casing Diameter: 1.5"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal/ft, 2"=0.16 gal/ft

Field Parameters: Start 1540

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1545	18.2	0.1	5.11	0.48	168.7	3.44	44.9	15.65
1550	18.1	0.2	5.25	0.40	166.7	5.08	9.3	15.74
1555	18.1	0.3	5.26	0.31	166.0	6.43	-1.5	15.76
1600	18.2	0.4	5.24	0.28	164.5	5.86	-10.2	15.78
1605	18.2	0.5	5.23	0.26	163.8	5.34	-14.5	15.80
1610	18.4	0.6	5.23	0.27	163.5	4.10	-17.4	15.80

Stop 12/22/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
OC Pesticides	2- 1L Amber	None

Stop 12/22/14

Remarks Flow Rate: 100 mL/min

Sampling Personnel Jared Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/23/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number COE-MW-02

Rep./Field Blank No. —

Sample Collection Time 0951

Weather 50°F Cloudy/Fog

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 19.9

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 16.11

Screened Interval (ft bls) 14.9 - 19.9

Water Column ___ (ft) Gallons in well

Casing Diameter: 1.5"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 0920

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
0925	0.1	18.0	5.28	0.88	121.7	12.28	30.9	17.38
0930	0.2	18.4	5.39	0.45	120.6	24.47	3.7	17.68
0935	0.3	18.5	5.41	0.30	118.7	28.97	-9.2	17.80
0940	0.4	18.6	5.40	0.25	117.0	21.83	-19.4	17.88
0945	0.5	18.7	5.40	0.23	116.3	13.62	-28.2	17.91
0950	0.6	18.7	5.40	0.25	116.3	12.16	-30.5	17.92

JJF 12/23/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
OC Pesticides	2- 1L Amber	Ice

JJF 12/23/14

Remarks Flow Rate: 100 mL/min

Sampling Personnel Jared Fino

C:\Users\jfino\Desktop\Office Forms\gw_log_lowflow.docx

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001 Date 12/23/14

Site Location: HAA-01 Savannah, Ga Monitoring Well Number COE-MW-03

Rep./Field Blank No. — Sample Collection Time 1051

Weather 60°F Cloudy/Fog Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 20 Casing stick-up above concrete (feet) 3

Depth to water from top of casing 14.68 Screened Interval (ft bls) 20

Water Column ___ (ft) Gallons in well ___ Casing Diameter: 1.5"

Evacuation Volume (x 3) = Low Flow Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 1020

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1025	0.1	17.9	5.39	2.01	146.9	47.62	103.6	15.96
1030	0.2	17.7	5.32	2.82	148.1	43.90	111.9	15.74
1035	0.3	17.8	5.36	0.96	224.0	46.27	42.9	16.05
1040	0.4	18.2	5.37	0.52	258.9	43.62	23.2	16.20
1045	0.5	18.3	5.37	0.40	272.1	39.17	13.7	16.25
1050	0.6	18.3	5.37	0.41	273.9	43.49	6.5	16.30

JAF 12/23/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260, 1,4 Dioxane	3- 40mL VOA vials	HCl
~~RCRA 8 Metals (Total & Dissolved)~~	1	
RCRA 8 Metals (Total & Dissolved)	1- 250 mL Plastic	HNO3
Hex. Chrome (Total & Dissolved)	1- 250 mL Plastic	NONE

JAF 12/23/14

Remarks Flow Rate: 100mL/min

Sampling Personnel Jared Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/19/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01-COE-MW-04

Rep./Field Blank No. —

Sample Collection Time 1231

Weather 60°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 9.24

Screened Interval (ft bls) 10-15

Water Column ___ (ft) Gallons in well ___

Casing Diameter: ~~2"~~ 1.5"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 1158

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1203	0.1	18.7	5.77	0.73	106.5	11.65	40.0	9.60
1208	0.2	18.5	5.71	0.45	105.2	8.48	22.6	9.63
1213	0.3	18.4	5.70	0.42	105.4	8.67	19.5	9.64
1218	0.4	18.5	5.70	0.39	105.8	7.24	18.3	9.64
1223	0.5	18.5	5.70	0.36	106.0	7.54	14.5	9.65
1228	0.6	18.5	5.69	0.34	106.1	5.42	7.2	9.66

JMF 12/19/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
RCRA 8 Metals	1-250 mL Plastic	HNO_3
Hex Chrome	1-250 mL Plastic	NONE

JMF 12/19/14

Remarks Flow Rate: 100mL/min

Sampling Personnel Jared Fino

C:\Users\jfino\Desktop\Office Forms\gw_log_lowflow.docx

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-14-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01COEMW05

Rep./Field Blank No. —

Sample Collection Time 1212

Weather Sunny, 55°F, no wind

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 8.94

Screened Interval (ft bls) 10-15

Water Column 6.06 (ft) Gallons in well 0.5

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 1130 Begin pumping HA01COEMW05

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1140	0.1	17.74	5.98	1.00	110	38	105.3	9.49	75
1145	0.2	17.70	5.94	0.66	113	21	33.7	9.55	75
1150	0.3	17.71	5.94	0.63	112	9	29.4	9.57	75
1155	0.4	17.66	5.92	0.69	113	6	16.2	9.60	75
1200	0.5	17.75	5.92	0.52	114	3	12.1	9.60	75
1205	0.6	17.71	5.92	0.48	115	3	7.1	9.60	75
1210	0.7	17.89	5.91	0.47	115	2	3.7	9.60	75
			DBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
Metals	1 -250 mL plastic	HNO_3
Hex Chrome	1-250 mL plastic	unpreserved

Remarks 0.7 gallons purged

Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/19/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01-COE-MW-06

Rep./Field Blank No. ~

Sample Collection Time 1137

Weather 60°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 9.28

Screened Interval (ft bls) 10-15

Water Column ___ (ft) Gallons in well ___

Casing Diameter: 1.5"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 1105

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1110	0.1	18.3	5.72	0.93	224.0	18.94	74.8	9.76
1115	0.2	17.9	5.70	0.59	216.0	13.42	67.5	9.81
1120	0.3	18.0	5.70	0.51	215.4	14.03	59.1	9.84
1125	0.4	18.1	5.71	0.42	216.1	14.39	47.9	9.84
1130	0.5	18.1	5.71	0.42	216.7	13.22	43.9	9.85
1135	0.6	18.0	5.71	0.43	219.6	9.63	35.5	9.87

JMF 12/19/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
RCRA 8 Metals	1- 250 mL Plastic	HNO_3
Hex. Chrome	1- 250 mL Plastic	None

JMF 12/19/14

Remarks Flow Rate: 100 mL/min

Sampling Personnel Jared Fino

C:\Users\jfino\Desktop\Office Forms\gw_log_lowflow.docx

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-19-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01 COEMW07

Rep./Field Blank No. —

Sample Collection Time 1006

Weather Sunny, 55°F, no wind

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 8.95

Screened Interval (ft bls) 10-15

Water Column 6.05 (ft) Gallons in well

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
940	0.1	17.23	5.74	0.69	208	29	85.3	9.39	75
945	0.2	17.25	5.78	0.65	204	26	72.0	9.44	75
950	0.3	17.57	5.78	0.50	192	23	39.1	9.46	75
955	0.4	17.98	5.79	0.41	186	16	20.2	9.48	75
1000	0.5	18.00	5.79	0.40	184	11	17.7	9.48	75
1005	0.6	18.01	5.79	0.40	183	9	13.4	9.48	75
			DBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

Remarks 0.6 gallons purged

Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/4/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number COE-MW-08

Rep./Field Blank No. —

Sample Collection Time 0911

Weather 50°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 9.86

Screened Interval (ft bls) 10-15

Water Column ___ (ft) Gallons in well ___

Casing Diameter: 1.5"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal/ft, 2"=0.16 gal/ft

Field Parameters: ~~Start~~ 0835

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
0840	0.1	16.4	5.01	1.08	983	93.96	125.6	10.47
0845	0.2	16.6	5.23	0.66	937	115.8	102.9	10.48
0850	0.3	16.7	5.29	0.48	903	113.3	86.9	10.50
0855	0.4	16.9	5.32	0.44	885	108.6	76.2	10.53
0900	0.5	16.9	5.34	0.42	878	101.6	69.6	10.57
0905	0.6	17.2	5.37	0.44	873	80.90	61.7	10.58
				Jaf	12/4/14			

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
RCRA 8 Metals (Total & Dissolved)	1-250mL Plastic	HNO_3
Hex. Chrome (Total & Dissolved)	1-250mL Plastic	None
Jaf 12/4/14		

Remarks Flow Rate: 100mL/min

Sampling Personnel Jared Fino

C:\Users\jfino\Desktop\Office Forms\gw_log_lowflow.docx

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/16/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HMW-02

Rep./Field Blank No. —

Sample Collection Time 1045

Weather 50°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 14.6

Casing stick-up above concrete (feet) ~2

Depth to water from top of casing 13.73

Screened Interval (ft bls) 4.6 – 14.6

Water Column 0.87 (ft) Gallons in well 0.12

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 1012

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1017	0.1	21.3	4.77	7.56	52.0	262.0	230.6	14.34
1022	0.2	21.3	5.01	6.90	35.1	409.2	226.1	14.42
1027	0.3	21.3	5.08	7.08	33.4	672.8	226.0	14.47
1032	0.4	21.4	5.14	7.71	33.6	602.7	222.5	14.52
1037	0.5	21.6	5.14	7.47	33.5	308.3	221.6	14.58
1042	0.6	21.6	5.14	7.37	33.4	251.1	220.4	14.58

JMF 12/16/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

JMF 12/16/14

Remarks Flow Rate: 100 mL/min

Sampling Personnel Jared Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-16-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01HMW04

Rep./Field Blank No. —

Sample Collection Time 1006

Weather Sunny, 60°F, low winds

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 13

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 9.20

Screened Interval (ft bls) 3-13' & tubing set 10' btoc

Water Column 3.8 (ft) Gallons in well 0.6

Casing Diameter: ~~3-13~~ 2" DBM

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal/ft, 2"=0.16 gal/ft

Field Parameters: 920 Begin pumping HA01HMW04

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
925	0.1	18.13	6.35	0.70	356	3	170.8	9.30	75
930	0.2	18.24	6.33	0.55	357	<2	168.2	9.30	75
935	0.3	18.50	6.35	0.72	358	<2	164.5	9.30	75
940	0.4	18.79	6.36	0.54	358	<2	161.1	9.34	75
945	0.5	18.79	6.33	0.44	359	<2	158.1	9.34	75
950	0.6	18.85	6.33	0.40	359	<2	156.4	9.35	75
955	0.7	18.90	6.36	0.37	360	<2	151.9	9.36	75
1000	0.8	18.98	6.36	0.36	360	<2	150.6	9.37	75
1005	0.9	19.27	6.36	0.33	361	<2	150.7	9.40	75
			DBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

Remarks ~1 gallon purged

Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-16-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01HMW06

Rep./Field Blank No. MS/MSD

Sample Collection Time 1452

Weather Overcast, 70°F, low winds

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 13

Casing stick-up above concrete (feet) 2

Depth to water from top of casing 8.52

Screened Interval (ft bls) 3-13

Water Column 6.48 (ft) Gallons in well 1.1

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 1415 Begin pumping HA01HMW06

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1420	0.1	21.37	6.11	0.52	174	23	-62.1	8.88	85
1425	0.2	21.20	6.10	0.26	174	17	-40.4	8.90	85
1430	0.3	21.05	6.09	0.25	173	11	-43.0	8.95	85
1435	0.4	21.19	6.08	0.21	171	8	-36.1	9.10	85
1440	0.5	21.21	6.08	0.20	171	8	-34.6	9.14	85
1445	0.7	21.19	6.08	0.21	170	11	-30.2	9.25	85
1450	0.8	21.17	6.07	0.20	168	9	-20.8	9.40	85
			DBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
SVOCs	2- 1L amber	—

Remarks 0.8 gallons purged
Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-23-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01MW08

Rep./Field Blank No. —

Sample Collection Time 1142

Weather Overcast, 60°F

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 13'

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 8.65

Screened Interval (ft bls) 3-13'

Water Column 6.35 (ft) Gallons in well 1 gal

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 1105 Begin pumping HA01MW08

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flowrate
1115	0.1	17.25	6.89	4.41	242	55	-109.1	8.85	75
1120	0.2	17.90	6.76	4.24	246	24	-114.0	8.93	75
1125	0.3	17.87	6.69	4.25	246	20	-111.1	8.93	75
1130	0.4	18.01	6.63	3.97	248	7	-104.7	9.10	75
1135	0.5	17.98	6.57	3.85	249	12	-87.2	9.20	75
1140	0.6	18.01	6.46	3.78	249	6	-61.6	9.24	75
		DTW							

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

Remarks 0.6 gallons purged

Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-23-2014

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01/HMW09

Rep./Field Blank No. —

Sample Collection Time 1036

Weather Overcast, cool, 52°F

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 11.20

Screened Interval (ft bls) 5-15'

Water Column 3.8 (ft) Gallons in well 0.56 gal

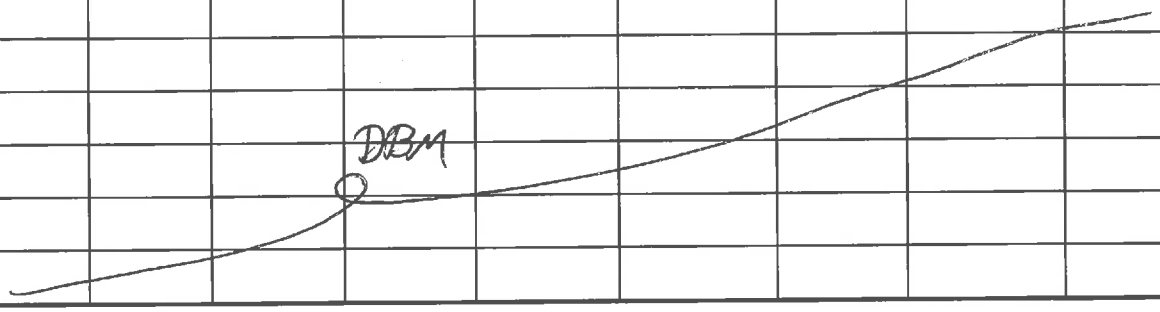
Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal/ft, 2"=0.16 gal/ft

Field Parameters: 1000 Begin pumping HA01/HMW09

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1010	0.15	18.41	6.31	0.95	294	22	-69.1	12.40	80
1015	0.25	18.49	6.27	0.82	294	14	-60.0	12.67	80
1020	0.40	18.63	6.27	0.66	294	13	-61.2	12.67	80
1025	0.5	18.62	6.29	0.65	294	31	-67.9	12.71	80
1030	0.6	18.77	6.29	0.66	294	11	-62.7	12.90	80
1035	0.7	19.15	6.29	0.70	294	17	-63.6	12.90	80
			DBM						



Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
SVOCs	2- 1L ambers	unpreserved

Remarks 0.7 gallons purged

Water: Some brown dirt during 1st half of purge, odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-17-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01 HMW10

Rep./Field Blank No. —

Sample Collection Time 1156

Weather Sunny, 60°F, no wind

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 12.8

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 9.60

Screened Interval (ft bls) 2.7-12.8 * tubing set 14' btoc

Water Column 3.2 (ft) Gallons in well 0.5 gal

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: ~~1115~~ DBM 1130

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1130	0.1	17.31	5.96	1.02	174	38	68.1	9.87	75
1135	0.2	18.35	5.92	0.61	173	21	65.6	9.94	75
1140	0.3	19.01	5.93	0.51	175	20	66.9	9.97	75
1145	0.4	19.30	5.92	0.36	176	20	71.5	9.97	75
1150	0.5	19.46	5.91	0.35	182	22	71.7	9.98	75
1155	0.6	19.53	5.90	0.35	186	32	73.7	10.00	75
		DBM							

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

Remarks 0.6 gallons purged
Water: clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-16-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01HMW11

Rep./Field Blank No. _____

Sample Collection Time 1406

Weather overcast, 65°F, no wind

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 14.8

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 12.60

Screened Interval (ft bls) 4.7-14.8 * Tubing set 14' btoc

Water Column 2.2 (ft) Gallons in well 0.34

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

1330 Reset tubing &

Field Parameters: ~~1315~~ Begin pumping HA01HMW11

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
(DBM) ~~1320~~	~~0.1~~	~~22.74~~	~~5.71~~	~~0.63~~	~~469~~	~~21~~	~~92.0~~	~~13.00~~	~~70~~
1340	0.2	22.37	5.81	1.22	474	9	-132.3	13.42	70
1345	0.3	22.26	5.81	0.44	476	6	-155.3	13.85	70
1350	0.4	22.21	5.80	0.38	475	8	-162.6	14.08	70
1355	0.5	22.09	5.80	0.34	474	7	-167.5	14.38	70
1400	0.6	21.82	5.80	0.28	474	6	-171.6	14.75	70
1405	0.7	21.74	5.80	0.28	474	7	-173.7	14.95	70
			DBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

Remarks Strong organic odor. Black matter in purge water. Dissipated after 0.2 gal of purge. 0.7 gallons purged.

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/16/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HMW-13

Rep./Field Blank No. D1

Sample Collection Time 1347

Weather 70°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 17.5

Casing stick-up above concrete (feet) 2

Depth to water from top of casing 14.21

Screened Interval (ft bls) 7.5-17.5

Water Column 3.29 (ft) Gallons in well 0.53

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start 1315

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1320	0.1	23.2	5.76	1.03	277.0	61.89	5.3	14.39
1325	0.2	23.0	5.80	0.63	279.5	25.93	-3.6	14.38
1330	0.3	23.2	5.84	0.52	279.2	30.07	-8.4	14.38
1335	0.4	23.1	5.86	0.42	280.9	11.81	-14.5	14.38
1340	0.5	23.1	5.85	0.43	280.7	9.29	-18.8	14.38
1345	0.6	23.0	5.85	0.38	280.0	10.78	-21.9	14.38

JMF 12/16/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
SVOC - 8270	2-1L Amber	None

JMF 12/16/14

Remarks Flow Rate: 100 mL/min

Sampling Personnel Jared Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/23/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HMW-14R

Rep./Field Blank No. —

Sample Collection Time 1151

Weather 60°F Cloudy/Fog

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 18.9

Casing stick-up above concrete (feet) 2

Depth to water from top of casing 13.48

Screened Interval (ft bls) 9.2-18.9

Water Column 5.42 (ft) Gallons in well 0.9

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 1118

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1123	0.1	19.7	4.96	0.62	102.5	29.85	168.9	13.66
1128	0.2	19.6	4.93	0.48	101.4	23.38	174.5	13.67
1133	0.3	19.9	4.95	0.43	103.2	18.50	152.7	13.68
1138	0.4	19.9	4.96	0.40	102.6	13.82	137.9	13.68
1143	0.5	20.0	4.97	0.37	102.4	16.49	124.0	13.68
1148	0.6	20.0	4.99	0.34	102.7	13.67	111.3	13.68

JJF 12/23/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
OC Pesticides	2-1L Amber	None

JJF 12/23/14

Remarks Flow Rate: 100mL/min

Sampling Personnel Jared Fino

C:\Users\jfino\Desktop\Office Forms\gw_log_lowflow.docx

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-19-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01ftMW21

Rep./Field Blank No. ~~—~~

Sample Collection Time 1106

Weather Sunny, 55°F, no wind

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 12'

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 8.26

Screened Interval (ft bls) 2-11.5'

Water Column 3.74 (ft) Gallons in well 0.5

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 1030 Begin pumping

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1040	0.1	17.77	5.98	0.47	126	295	82.7	8.41	75
1045	0.2	17.75	5.97	0.42	125	235	83.3	8.41	75
1050	0.3	17.69	5.96	0.37	125	198	71.8	8.44	75
1055	0.4	17.76	5.95	0.42	125	205	54.2	8.46	75
1100	0.5	17.83	5.95	0.39	125	157	40.5	8.47	75
1105	0.6	17.83	5.94	0.35	126	145	25.5	8.49	
			DBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
Metals (Total + Dissolved)	2- 250 mL plastic	HNO_3
Hex Chrome (Total + Dissolved)	2- 250 mL plastic	unpreserved

Remarks 0.6 gallons purged

Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-17-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number ~~HAHMW23~~ HA01HMW23

Rep./Field Blank No. —

Sample Collection Time 1046

Weather Sunny, 60°F, low winds

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 15

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 8.95

Screened Interval (ft bls) 5-15'* tubing set 15' btoc

Water Column 6.05 (ft) Gallons in well 1

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 1015 Begin pumping HA01HMW23

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1020	0.1	16.73	5.99	0.65	319	12	83.7	9.18	100 DBM
1025	0.2	16.83	5.98	0.50	320	13	74.5	9.25	100
1030	0.3	16.92	5.98	0.39	320	14	67.6	9.30	100
1035	0.4	17.04	5.99	0.35	324	11	51.2	9.35	100
1040	0.5	17.18	5.99	0.32	325	11	46.5	9.38	100
1046	0.6	17.14	6.00	0.32	327	11	35.5	9.38	100
				DBM					

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
SVOCs	2-1L amber jars	—

Remarks 0.6 gallons purged

Water; clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-17-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01HMW24

Rep./Field Blank No. —

Sample Collection Time 942

Weather Sunny, clear, 55°, low winds

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 12

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 9.07

Screened Interval (ft bls) 7-12 * tubing set 13.5'

Water Column 2.93 (ft) Gallons in well 0.5

Casing Diameter: 4"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft btoc

Field Parameters: 845

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flowrate
855	0.1	15.65	6.50	0.66	405	19	40.4	9.11	80
900	0.2	16.08	6.52	0.51	406	10	24.9	9.11	80
905	0.3	16.53	6.51	0.44	406	6	4.9	9.11	80
910	0.4	16.34	6.50	0.54	405	7	-7.6	9.11	80
915	0.5	16.51	6.46	0.43	403	5	-17.7	9.11	80
920	0.6	16.50	6.45	0.38	401	4	-20.1	9.11	80
925	0.7	16.94	6.44	0.35	402	4	-14.1	9.11	80
930	0.8	17.01	6.42	0.30	401	4	-27.2	9.11	80
935	0.9	17.10	6.39	0.28	399	4	-32.2	9.11	80
940	1.0	17.09	6.39	0.27	399	4	-35.3	9.11	80
				DBM					

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
SVOCs	2- 1L amber jar	—

Remarks 1 gallon purged

Water: clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-23-2014

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01MW09

Rep./Field Blank No. —

Sample Collection Time 922

Weather Rainy, low wind, 45°F

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 17

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 12.60

Screened Interval (ft bls) 7-17' *Tubing placed 15' btoc

Water Column 4.4 (ft) Gallons in well 0.70

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 840 Begin pumping HA01MW09

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
850	0.1	17.10	6.00	0.61	91	36	-50.0	12.87	75
855	0.2	17.57	5.92	0.67	90	29	-63.4	12.85	75
900	0.3	18.02	5.86	0.66	91	24	-64.2	12.87	75
905	0.4	18.22	5.77	0.46	90	20	-38.9	12.87	75
910	0.5	18.42	5.75	0.39	91	17	-30.4	12.88	75
915	0.6	18.49	5.75	0.38	92	21	-29.4	12.88	75
920	0.7	18.51	5.73	0.37	93	20	-25.6	12.88	75
		DBM							

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
Pesticides	2- 1L amber	unpreserved

Remarks 0.7 gallons purged

Water: mild turbidity, mild organic odor

Sampling Personnel Danny Mayes

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-22-2014

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01MW10

Rep./Field Blank No. —

Sample Collection Time 1642

Weather Rainy, 65°F

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 12'

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 7.05

Screened Interval (ft bls) 2-12' * tubing set 13' btoc

Water Column 4.95 (ft) Gallons in well 0.80 gal

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal/gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flowrate
1615	0.1	16.58	4.18	1.70	447	20	295.6	7.35	85
1620	0.2	16.90	4.16	1.48	446	9	317.6	7.30	85
1625	0.3	17.22	4.16	1.50	445	6	288.3	7.32	85
1630	0.4	17.25	4.17	1.63	444	4	284.3	7.35	85
1635	0.5	17.27	4.18	1.59	442	<2	250.1	7.32	85
1640	0.6	17.19	4.18	1.51	441	4	235.7	7.35	85
		DBM							

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

Remarks 0.6 gallons purged

Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-22-2014

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01MW11

Rep./Field Blank No. ----

Sample Collection Time 1550

Weather Rainy, 60°F

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 12'

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 9.20'

Screened Interval (ft bls) 2-12' & tubing set 13' btoc

Water Column 2.8 (ft) Gallons in well 0.45 gal

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters:

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1520	0.1	16.28	5.79	1.00	105	131	166.8	9.34	75
1525	0.2	16.62	5.85	0.81	104	89	139.3	9.37	75
1530	0.3	16.77	5.88	0.67	107	54	94.8	9.40	75
1535	0.4	16.91	5.89	0.69	111	35	60.0	9.40	75
1540	0.5	17.04	5.90	0.67	112	27	43.3	9.40	75
1545	0.6	17.06	5.90	0.76	117	24	27.5	9.40	75
			DBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

Remarks 0.6 gallons purged

Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/19/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01-MW-12

Rep./Field Blank No. —

Sample Collection Time 1047

Weather 55°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 12

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 10.71

Screened Interval (ft bls) 2-12

Water Column 1.29 (ft) Gallons in well 0.2

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start 1015

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1020	0.1	18.3	5.67	0.73	391.8	38.05	18.8	10.91
1025	0.2	18.0	5.52	0.43	390.6	18.10	13.5	10.96
1030	0.3	18.1	5.52	0.37	390.4	16.85	10.4	10.99
1035	0.4	18.1	5.50	0.34	389.9	14.39	6.2	11.04
1040	0.5	18.2	5.50	0.33	389.7	17.78	3.9	11.05	
1045	0.6	18.2	5.51	0.30	389.1	7.49	0.6	11.08
				JMF				
					12/19/14			

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
RCRA 8 Metals	1-250 mL Plastic	HNO_3
Hex. Chrome	1-250 mL Plastic	None
JMF 12/19/14		

Remarks Flow Rate: 100mL/min

Sampling Personnel Jared Fino

C:\Users\jfino\Desktop\Office Forms\gw_log_lowflow.docx

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/14/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01-MW-12D

Rep./Field Blank No. —

Sample Collection Time 1011

Weather 55°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 50

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 9.07

Screened Interval (ft bls) 40-50

Water Column 40.93 (ft) Gallons in well 6.5

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 0938

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
0943	0.1	17.7	7.02	0.86	325.7	6.51	-101.9	9.10
0948	0.2	18.0	7.14	0.54	322.1	4.60	-115.4	9.11
0953	0.3	18.0	7.15	0.48	321.9	3.95	-117.1	9.10
0958	0.4	18.0	7.17	0.46	322.1	2.45	-118.9	9.10
1003	0.5	18.0	7.17	0.44	322.1	4.42	-120.4	9.10
1008	0.6	18.0	7.17	0.41	322.0	2.54	-121.0	9.10

JAF 12/14/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

JAF 12/14/14

Remarks Flow Rate: 100 mL/min

Sampling Personnel Jon Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001 Date 12-19-14

Site Location: HAA-01 Savannah, Ga Monitoring Well Number HA01MW13

Rep./Field Blank No. — Sample Collection Time 912 (DBM) 922

Weather Sunny, 50°F, no wind Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 12 Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 8.82 Screened Interval (ft bls) 2-12

Water Column 3.18 (ft) Gallons in well 0.50 Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 830 Begin pumping HA01MW13

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
835	0.1	14.80	5.82	2.02	633	5.05	40.2	8.98	75
840	0.2	15.46	5.88	1.48	629	<2	27.3	9.02	75
845	0.3	16.00	5.90	1.10	627	2	18.7	9.05	75
850	0.4	16.08	5.90	0.95	626	<2	15.3	9.08	75
855	0.5	16.01	5.91	0.77	623	<2	10.3	9.10	75
900	0.6	16.10	5.91	0.69	619	<2	6.8	9.12	75
905	0.7	16.26	5.91	0.65	615	<2	4.2	9.13	75
910	0.8	16.36	5.91	0.57	615	<2	4.1	9.15	75
915	0.9	16.69	5.90	0.50	612	<2	11.6	9.17	75
920	1.0	16.86	5.90	0.49	610	<2	5.9	9.18	75
	DBM								

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
Metals	1-250 mL plastic, HNO_3	HNO_3
Hexavalent Cr	1- 250 mL plastic	

Remarks 1 gallon purged
Water: Clear and odorless

Sampling Personnel Danny Mays

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/16/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01-MW-14

Rep./Field Blank No. ~~0~~ D2

Sample Collection Time 1537

Weather 70°F Cloudy

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 13

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 9.32

Screened Interval (ft bls) 3-13

Water Column 3.68 (ft) Gallons in well 0.6

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 1505

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1510	0.1	19.5	4.41	0.47	417.7	406.9	77.2	9.47
1515	0.2	19.4	4.38	0.33	417.6	312.2	63.7	9.49
1520	0.3	19.3	4.36	0.26	417.5	248.9	48.9	9.51
1525	0.4	19.3	4.32	0.37	428.9	182.1	58.9	9.54
1530	0.5	19.3	4.32	0.45	440.1	137.9	66.1	9.56
1535	0.6	19.2	4.32	0.59	448.5	118.1	78.9	9.58

JMF 12/16/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
RCRA 8 Metals (Total & Dissolved)	1- 250mL Plastic	HNO_3
Hex. Chrom. (Total & Dissolved)	1-250 mL Plastic	None
Pesticides	2- 1L Amber	None

Remarks Flow Rate: 100 mL/min

Sampling Personnel Jared Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/17/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01-MW-140

Rep./Field Blank No. —

Sample Collection Time 1151

Weather 55°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 49.0

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 7.20

Screened Interval (ft bls) 39 - 49

Water Column 41.8 (ft) Gallons in well 6.7

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 1117

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
1122	0.1	18.4	6.31	0.88	291.9	0.28	-2.7	7.20
1127	0.2	18.1	6.35	0.55	293.3	0.00	-14.0	7.21
1132	0.3	18.3	6.35	0.45	294.5	0.00	-19.1	7.21
1137	0.4	18.3	6.36	0.38	294.3	0.00	-22.7	7.21
1142	0.5	18.4	6.36	0.36	293.8	0.00	-24.3	7.21
1147	0.6	18.2	6.36	0.35	293.1	0.00	-26.0	7.21

JMF 12/17/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

JMF 12/17/14

Remarks Flow Rate: 100mL/min

Sampling Personnel Jared Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12/17/14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01-MW-15

Rep./Field Blank No. MS/MSD

Sample Collection Time 1015

Weather 50°F Sunny

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 14.5

Casing stick-up above concrete (feet) 3

Depth to water from top of casing 12.99

Screened Interval (ft bls) 4.5-14.5

Water Column 1.51 (ft) Gallons in well 0.24

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: Start: 0922

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)
0927	0.1	17.9	5.47	1.44	91.3	16.57	43.7	13.48
0932	0.2	18.2	5.60	0.96	88.5	19.73	18.9	13.58
0937	0.3	18.5	5.64	0.69	88.5	19.42	5.5	13.67
0942	0.4	18.5	5.63	0.62	88.7	18.36	0.5	13.75
0947	0.5	18.5	5.60	0.59	88.9	14.83	-1.3	13.81
0952	0.6	18.4	5.60	0.64	89.7	17.25	-2.6	13.88
0957	0.7	18.3	5.56	0.65	89.2	18.00	-10	13.95

JMF 12/17/14

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl
RCRA 8 Metals (Total + Dissolved)	1- 250mL Plastic	HNO_3
Hex. Chrome (Total + Dissolved)	1- 250mL Plastic	NONE

JMF 12/17/14

Remarks Flow Rate: 100mL/min

Sampling Personnel Jared Fino

ARCADIS

WATER SAMPLING LOG

Project No. 10153001.0001.DE001

Date 12-16-14

Site Location: HAA-01 Savannah, Ga

Monitoring Well Number HA01MW17

Rep./Field Blank No. —

Sample Collection Time 1106

Weather Sunny, 60°F, low winds

Sampling Method Peristaltic – Low Flow

Evacuation Data:

Depth to bottom of well (ft bls) 14.8

Casing stick-up above concrete (feet) 2'

Depth to water from top of casing 8.63

Screened Interval (ft bls) 4.7-14.8 & Tubing set 12.5' btoc

Water Column ___ (ft) Gallons in well ___

Casing Diameter: 2"

Evacuation Volume (x 3) = Low Flow

Casing Volume 1"=0.04 gal gal/ft, 2"=0.16 gal/ft

Field Parameters: 1035 Begin pumping HA01MW17

Time	Gallons Purged	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turb (NTU)	Redox (mV)	Depth to Water (ft)	Flow rate
1040	0.1	17.84	5.25	2.50	91	353	269.5	8.75	75
1045	0.2	17.40	5.17	2.46	91	340	276.4	8.81	75
1050	0.3	17.51	5.07	2.50	90	343	281.3	8.87	75
1055	0.4	17.52	5.03	2.54	90	350	292.4	8.91	75
1100	0.5	17.63	5.01	2.63	90	394	296.1	8.95	75
1105	0.6	17.65	4.99	2.61	90	413	300.4	9.01	75
			PBM						

Analyses:

Analytical Parameter	Sample Bottles	Preservative
VOCs – 8260	3- 40mL VOA vials	HCl

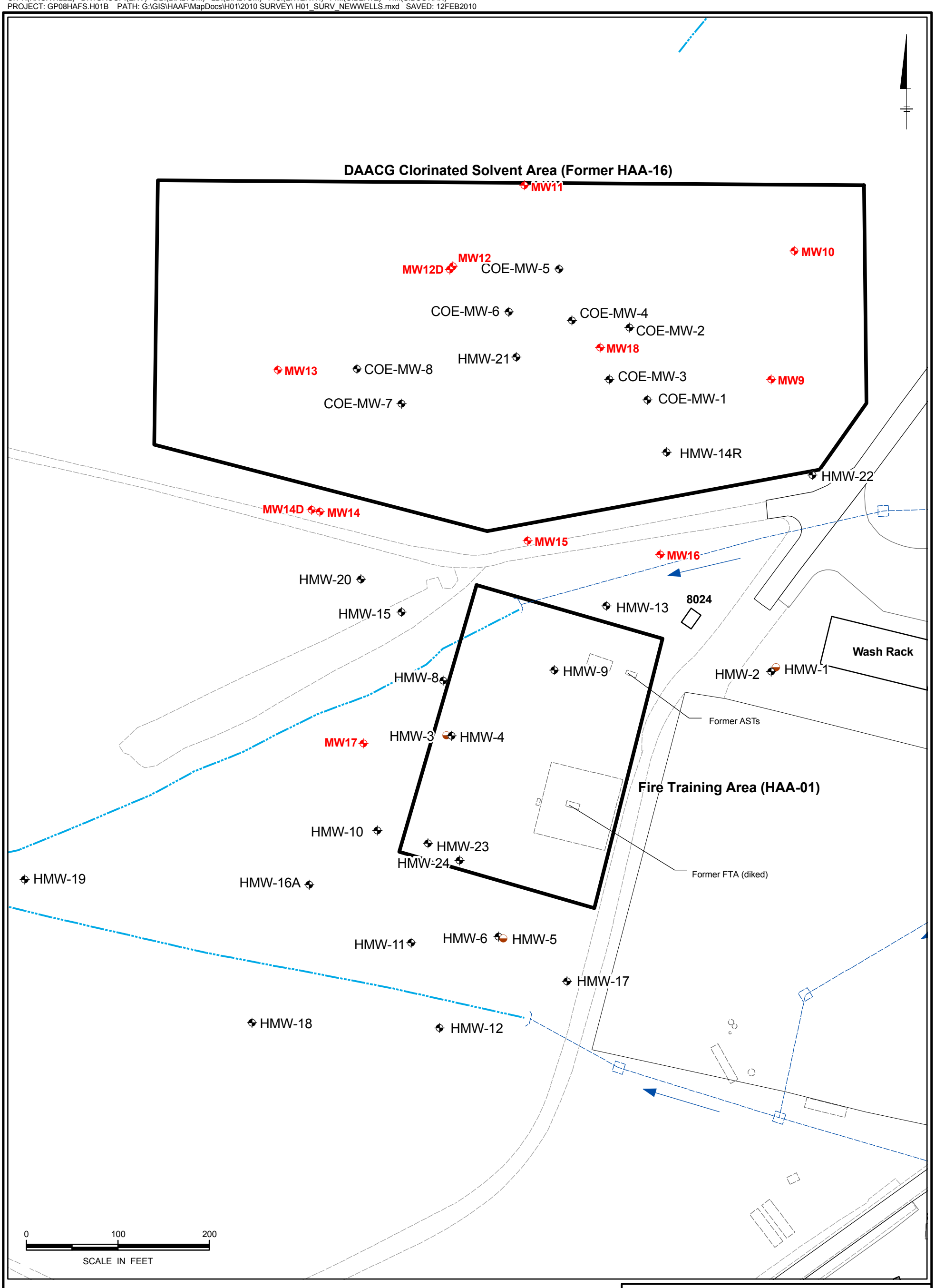
Remarks 0.6 gallons purged Water. Turbid, cloudy brown, odorless

Sampling Personnel Danny Mays

APPENDIX J

Site Map with Survey Data

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN)
PROJECT: GP08HAFS.H01B PATH: G:\GIS\HAAF\MapDocs\H01\2010 SURVEY\ H01_SURV_NEWWELLS.mxd SAVED: 12FEB2010



REFERENCE: SAGIS (2008).

LEGEND

- Storm Water Drainage System
- Surface Water Flow Direction
- Monitor Well (shallow)
- Monitor Well (deep)
- New Monitor Well (Bateman Civil Survey, February 2009)

HUNTER army AIRFIELD, GEORGIA
HAA-01 FORMER FIRE TRAINING/DAACG AREAS
BATEMAN CIVIL SURVEY

Site Map

ARCADIS

FIGURE
-

DATUM NAVD 88				
BORING OR WELL NAME	NORTHING	EASTING	TOP OF CASING	GROUND ELEVATION
OW-01	735204.3417	972377.5301	26.93	26.85
OW-02	735205.6259	972413.9768	28.90	28.76
OW-03	735224.5979	972408.4630	28.03	27.90
BSP-01	735200.73	972395.25	28.27	27.96
MW/H01MW070	735178.23	972162.45	18.63	18.57

Monitoring Wells

(Hunter)

WELL #	SITE	NORTHING	EASTING	TOP	CASE
MW15	HAA-01	735033.32	972311.79	28.41	28.11
MW16	HAA-01	735017.97	972456.13	36.35	35.95
MW17	HAA-01	734811.24	972131.72	25.11	24.86
MW14	HAA-01	735065.10	972084.42	23.66	23.22
MW14D	HAA-01	735067.33	972075.32	24.29	23.92
MW13	HAA-01	735220.19	972038.26	20.43	20.13
MW18	HAA-01	735244.77	972390.49	29.82	29.58
MW11	HAA-01	735422.52	972307.95	20.34	19.74
MW12	HAA-01	735333.97	972229.69	21.42	21.22
MW12D	HAA-01	735329.99	972226.29	21.30	21.00
MW10	HAA-01	735350.72	972603.33	23.88	23.51
MW9	HAA-01	735209.55	972577.98	34.01	33.66

APPENDIX K

Waste Manifests

GRR - ATTALLA, INC.

Mailing Address:
1229 Valley Drive
Attalla, AL 35954
Tel.: (256) 538-3800
Fax Office: (256) 538-1836
Fax Lab: (256) 538-2634

Shipping Address:
1229 Valley Drive
Attalla, AL 35954

Profile Update: ___

WASTE MATERIAL PROFILE FORM
PROFILE NO. _____

A. GENERAL INFORMATION

GENERATOR	Hunter Army Airfield (HAA-01)
FACILITY ADDRESS (PO BOX)	106 MacArthur Circle, Building 615
FACILITY SITE ADDRESS	106 MacArthur Circle, Building 615
CITY, STATE, ZIP	Savannah, GA 31419
TECHNICAL CONTACT	Algeana Stevenson
NAME OF WASTE	IDW Water with D028 (HAA-01)
PROCESS GENERATING WASTE	Investigative Derived Waste

TRANSPORTER	A&D Environmental Services (GA)
GENERATOR USEPA ID NO.	GA4210022733
GENERATOR STATE ID NO.	
PHONE NO.	
TITLE	
SIC CODE	

B. PHYSICAL CHARACTERISTICS OF WASTE

PHYSICAL STATE @ 70 F: X Liquid ___ Semi-Solid ___ Solid
ODOR: X None ___ Mild ___ Strong Describe ___
FLASH POINT: ___ <100 F ___ 101-139 F ___ 140-200 F
X >200 F ___ No Flash Value ___
BTU RANGE: ___ /lb ___ /gal
SPECIFIC GRAVITY: ___ <0.8 X >.8<1 ___ >1 EXACT ___
SOLIDS RANGE: <1 %

LAYERS: X Single-Phase ___ Bi-layer ___ Multilayer
COLOR: characteristic
pH RANGE: ___ >2-5 X >5-9 ___ > 9 - < 12.5
UNBURNABLE RESIDUE RANGE: ___ %
WATER CONTENT RANGE: ___ %Dissolved
___ % Free Layer
VISCOSITY RANGE: ___ Centipoises

C. CHEMICAL COMPOSITION

	RANGE
Water	100 %
cis-1,2-Dichloroethene level 1.9 ppm	%
	%
	%
Drum #H-676	%
	%
See attached analytical-	%
PL18008/PL19009/PL20001/PL24008	%
	%
	%
	%
	%

D. METALS X NONE ___ TOTAL (ppm) ___ TCLP (ppm)

ANTIMONY (SB)	> 10.0	___ No ___ Yes	CONC. RANGE	___	
ARSENIC (AS)	> 5.0	___ No ___ Yes	CONC. RANGE	___	
BARIUM (BA)	> 100.0	___ No ___ Yes	CONC. RANGE	___	
BERYLLIUM (BE)	> 1.0	___ No ___ Yes	CONC. RANGE	___	
CADMIUM (CD)	> 1.0	___ No ___ Yes	CONC. RANGE	___	
CHROMIUM (CR)	> 5.0	___ No ___ Yes	CONC. RANGE	___	
LEAD (PB)	> 5.0	___ No ___ Yes	CONC. RANGE	___	
MERCURY (HG)	> 0.2	___ No ___ Yes	CONC. RANGE	___	
NICKEL (NI)	> 5.0	___ No ___ Yes	CONC. RANGE	___	
SELENIUM (SE)	> 1.0	___ No ___ Yes	CONC. RANGE	___	
SILVER (AG)	> 5.0	___ No ___ Yes	CONC. RANGE	___	
THALLIUM (TL)	> 10.0	___ No ___ Yes	CONC. RANGE	___	

E. OTHER COMPONENTS - ___ PPM ___ %

SULFUR ___ PCB'S ___ HALOGENS ___

F. HAZARDOUS CHARACTERISTICS

REACTIVITY X None ___ Water Reactive ___ Shock Sensitive
___ Pyrophoric ___ Explosive ___ Sulfides: ___
___ Cyanides: ___ ___ Other: ___
OTHER HAZARDOUS CHARACTERISTICS: ___ Ignitable
___ Corrosive ___ TCLP Wastes ___ Other: ___
USEPA HAZARDOUS WASTE? X Yes ___ No
USEPA HAZARDOUS WASTE CODE(S): D028

STATE HAZARDOUS WASTE? ___ Yes X No
STATE HAZARDOUS WASTE CODE(S): SAME AS USEPA

G. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? X Yes ___ No
PROPER SHIPPING NAME Hazardous Waste Liquid, n.o.s.
HAZARD CLASS 9 ID NO. NA3082
PACKAGING GROUP III EMERGENCY RESPONSE GUIDE: 171
PRIMARY CONSTITUENTS CONTRIBUTING TO HAZARD:
1,2-Dichloroethene
24 HR. EMERGENCY PHONE NO. ___
METHOD OF SHIPMENT: ___ Bulk X Drums (Type/Size 55 G
ESTIMATED VOLUME: ___ Gal 1 Drums /Tons per ___

H. SPECIAL HANDLING OR INCOMPATIBILITIES

IS THIS WASTE SUBJECT TO BENZENE WASTE NESHAP? ___ Yes X No ___ Additional Pages Attached

GENERATOR CERTIFICATION

I hereby certify that all information in this and all attached documents is true and accurate, and that all known or suspected hazards have been disclosed. I certify that there are no hazardous constituents or characteristics except as described above, and if the waste stream or process generating the waste changes, I will notify M & M Chemical prior to shipment of the waste.

Signature

Algeana Stevenson
Printed/Typed Name

Chemical Eng.
Title

29 Jan 15
Date

TC RULE CERTIFICATION FORM

PROFILE #: _____

Generator Name: Hunter Army Airfield (HAA-01) EPA ID#: GA4210022733

Location: 106 MacArthur Circle, Building 615, Savannah, GA 31419

Waste Description: IDW Water with D028 (HAA-01)

CHARACTERISTICS OF HAZARDOUS WASTE: Indicate if this waste contains any of the following characteristics based on criteria mandated by 40 CFR 261.21, 261.22, 261.23, 261.24

			Regulatory Threshold Level	Check One Yes	Check One No	Check One Scientific Data	Generators Knowledge	Actual Value
D001	Characteristic of Ignitability	<	140 F		x			F
D002	Characteristic of Corrosivity	≤ ≥	2 or 12.5		x			pH
D003	Characteristic of Reactivity				x			

	Constituent	*Regulatory Threshold Level, ppm	Check One Yes	Check One No	Check One Scientific Data	Generators Knowledge	Actual Value ppm
D004	Arsenic	5.0		x			
D005	Barium	100.0		x			
D006	Cadmium	1.0		x			
D007	Chromium	5.0		x			
D008	Lead	5.0		x			
D009	Mercury	0.2		x			
D010	Selenium	1.0		x			
D011	Silver	5.0		x			
D012	Endrin	0.02		x			
D013	Lindane	0.4		x			
D014	Methoxychlor	10.0		x			
D015	Toxaphene	0.5		x			
D016	2, 4-D (2,4-Dichloro-phenoxyacetic acid)	10.0		x			
D017	2,4, 5-TP (Silvex)	1.0		x			
D018	Benzene	0.5		x			
D019	Carbon Tetrachloride	0.5		x			
D020	Chlordane	0.03		x			
D021	Chlorobenzene	100.0		x			
D022	Chloroform	6.0		x			
D023	o-Cresol	200.0		x			
D024	m-Cresol	200.0		x			
D025	p-Cresol	200.0		x			

--Continued--

PROFILE #: _____

	Constituent	*Regulatory Threshold Level, ppm	Check One Yes	Check One No	Check One Scientific Data	Generators Knowledge	Actual Value ppm
D026	Cresol	200.0		X			
D027	1,4 Dichlorobenzene	7.5		X			
D028	1,2 Dichloroethane	0.5	X		X		1.90
D029	1,1 Dichloroethylene	0.7		X			
D030	2,4 Dinitrotoluene	0.13		X			
D031	Heptachlor (and its hydroxide)	0.008		X			
D032	Hexachlorobenzene	0.13		X			
D033	Hexachlorobutadiene	0.5		X			
D034	Hexachloroethane	3.0		X			
D035	Methyl Ethyl Ketone	200.0		X			
D036	Nitrobenzene	2.0		X			
D037	Pentachlorophenol	100.0		X			
D038	Pyridine	5.0		X			
D039	Tetrachloroethylene	0.7		X			
D040	Trichloroethylene	0.5		X			
D041	2,4,5-Trichlorophenol	400.0		X			
D042	2,4,6-Trichlorophenol	2.0		X			
D043	Vinyl Chloride	0.2		X			

As defined by the TCLP (Method 1311), EP Toxicity is no longer acceptable

Listed Hazardous Waste: Indicate if this waste also contains any listed hazardous wastes coded in 40 CFR 261.31, 261.32 and 261.33 by including the appropriate EPA hazardous waste code(s).

D028

GENERATOR CERTIFICATION:

I hereby certify that all information submitted on this form and all attached documents are true and accurate. In the event that this form is not fully completed, I authorize M&M Chemical Company to conduct necessary testing at my expense to properly complete the form.

Signature: _____ Date: 29 Jan 15

Print Name: Algeana Stevenson Title: Chemical Eng.

THIS CERTIFICATION/RECERTIFICATION IS REQUIRED FOR EACH PROFILE
ORIGINAL SIGNATURE REQUIRED

GIANT RESOURCE RECOVERY
BENZENE NESHAP QUESTIONNAIRE

Generator: Hunter Army Airfield (HAA-01) Profile No.:

Description of Waste: IDW Water with D028 (HAA-01)

1. Is the waste generated by any of the following types of industries?

   A. Petroleum Refineries (SIC 2911)
   B. Chemical Manufacturing Plants (SIC 2800-2899)
   C. Coke By-Product Recovery Plants (SIC 3312)
   D. Treatment, Storage and Disposal Facilities handling benzene wastes from A, B, or C above (SIC 4953, 4959, 9511, 4214)

   Yes ___ Which SIC Code? _____ No x

2. Does the current Waste Profile indicate the presence of benzene in this waste or is the waste described by one or more of the following waste codes: D018, F005, U019, F024, F037, F038, K085, K104, K105, and K141-K147?

   Yes ___ (Circle waste code) No x

3. Will any shipments of this waste contain greater than 10% water?

   Yes ___ No x

4. What is the benzene concentration range in this waste?

   Minimum value: _____ Maximum Value: _____ ppm or % (Circle One)
   *Note that the maximum value should represent the maximum possible benzene concentration in any shipment.

   4.1 Are these concentrations based on knowledge or past data(Circle one)? Knowledge / Past Data

   4.2 If concentrations are based on "knowledge" please provide a description of basis for knowledge.

   _____

   4.3 If concentrations are based on "test data" please provide test data obtained_____

   4.4 Has process changed since date on concentration determination (Circle one)? Yes / No

5. If you answered yes to item 1 and 2 above, what is your facility's Total Annual Benzene (TAB) in mega-grams (10^6 grams) per year?

   ___ Mg/yr

6. Is this waste subject to the Benzene Waste Operations NESHAP control requirements (per 40 CFR 61.342(b))?

   Yes ___ No x

GENERATOR CERTIFICATION:
I hereby certify that all information submitted in this document is true, accurate and complete to the best of my knowledge and belief. In addition, I also certify that the upper range benzene concentration provided in response to question 4 above represents the maximum potential benzene concentration in any shipment of this waste stream that will be sent to GRR.

Signature: [signature] Title: Chemical Eng.

Print Name: Alyeandra Stevenson Date: 29 Jan 15

APPENDIX L

Aerial Photograph

3-22-51 1-165 GS-NV



AERIAL PHOTOGRAPHIC SAFETY 4172 AERIAL PHOTOGRAPHIC SAFETY

4173 AERIAL PHOTOGRAPHIC SAFETY

USGS science for a changing world

APPENDIX M

Hydraulic Conductivity Calculations

APPENDIX M

Hydraulic Conductivity Calculations

Environmental Science & Engineering, Inc.
P.O. Box 1703 Gainesville, Florida 32602-1703
904-332-3318 Fax 904-332-0507

HUNTER
JOB 3912015G-0100-3130 370
SHEET NO. 1 OF
CALCULATED BY G Wise DATE 8/7/92
CHECKED BY DATE
SCALE

Purpose: Calculate groundwater velocities from available slug test data and piezometric surface elevation data.

Reference: Peck, Hanson, & Thornburn, 1974

Calculation: Linear groundwater flow velocity.

I = gradient

K = hydraulic conductivity

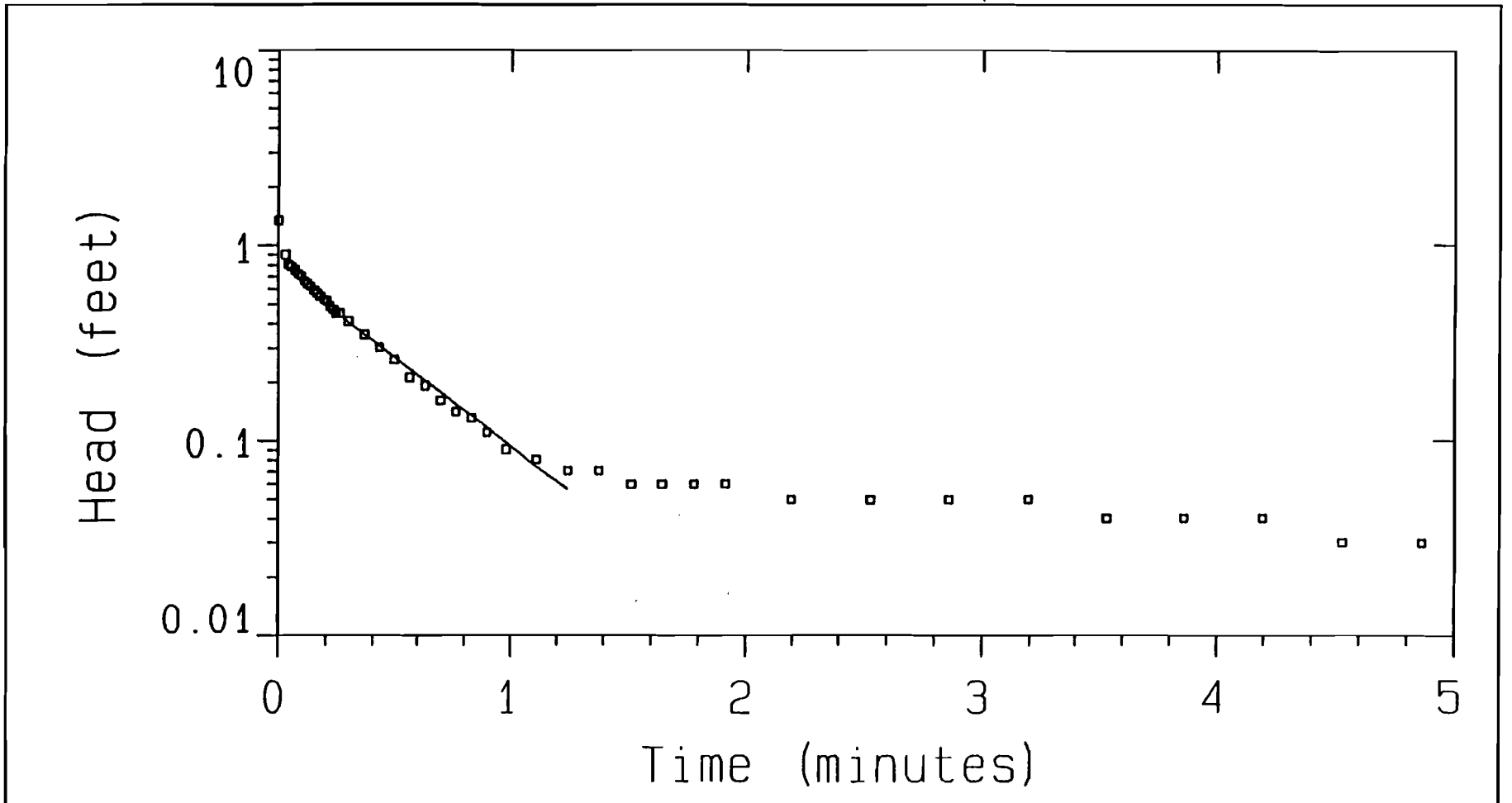
n = porosity (assumed to be 30%)

V = linear flow velocity

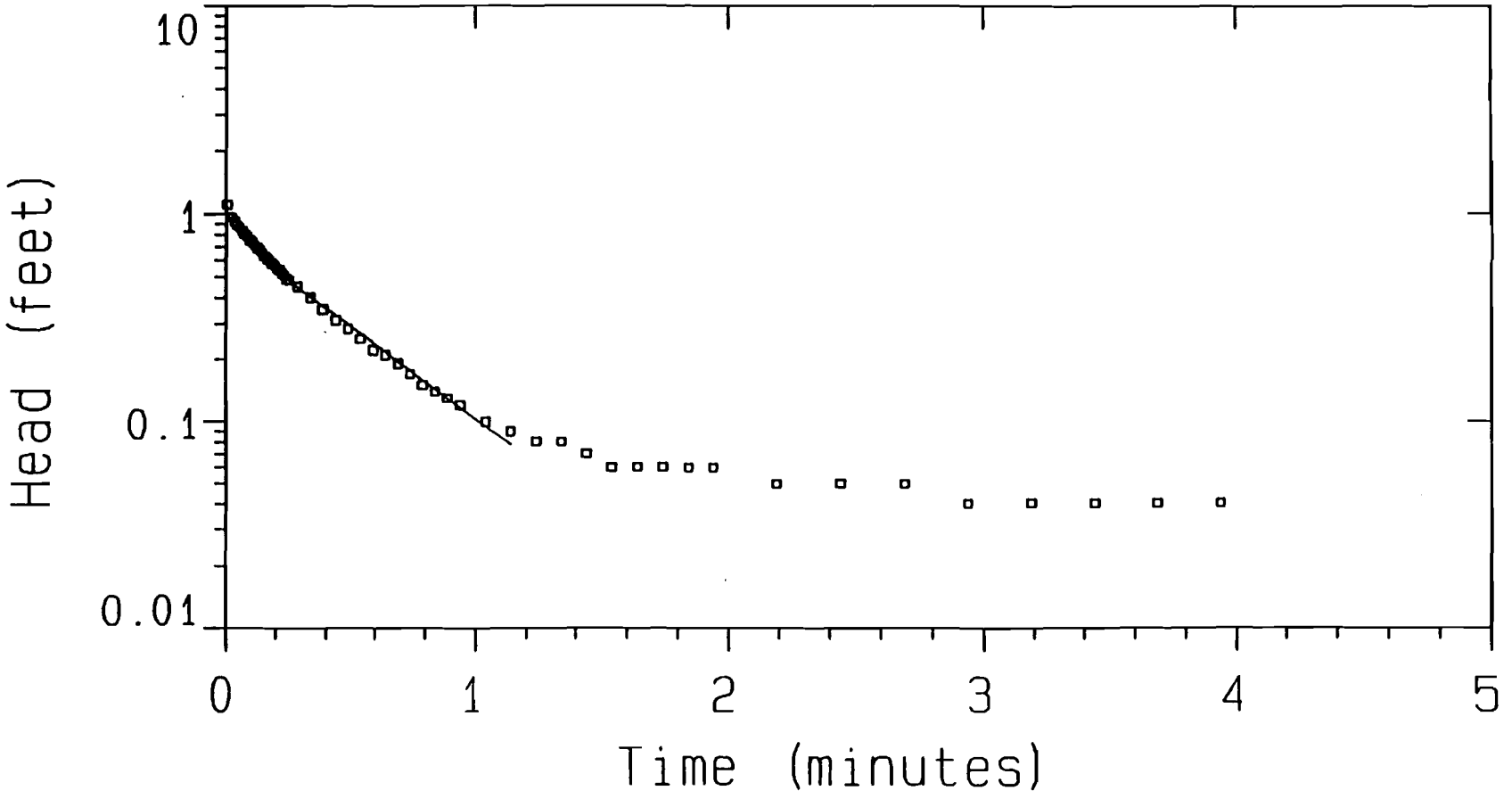
$$V = KI/n$$

$$V\ (ft/min) \times 60\ min/hr \times 24\ hr/day \times 365\ day/yr \equiv ft/yr$$

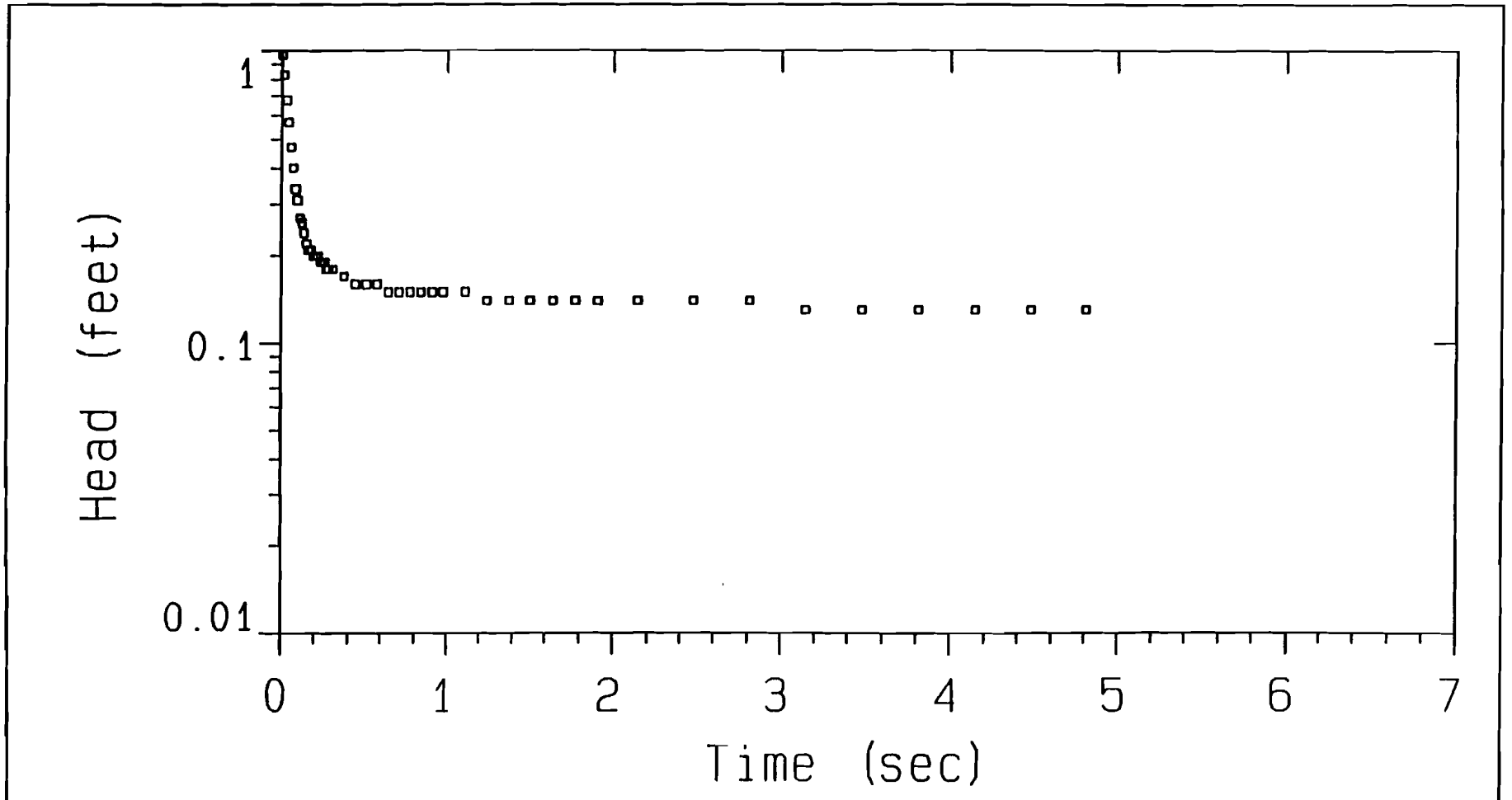
WELL NO.	I (ft/ft)	K (ft/min)	V (ft/min)	V (ft/yr)
HMW-4 (shallow)	0.0097 (low)	0.00111 (low)	3.6×10^{-5}	18.8
	0.0154 (avg)	0.00133 (avg)	6.8×10^{-5}	35.9
	0.0187 (high)	0.00155 (high)	9.7×10^{-5}	50.7
HMW-3 (deep)	0.0097 (low)	0.00169 (low)	5.5×10^{-5}	28.7
	0.0119 (avg)	0.00177 (avg)	7.0×10^{-5}	36.8
	0.0131 (high)	0.00184 (high)	8.0×10^{-5}	42.2



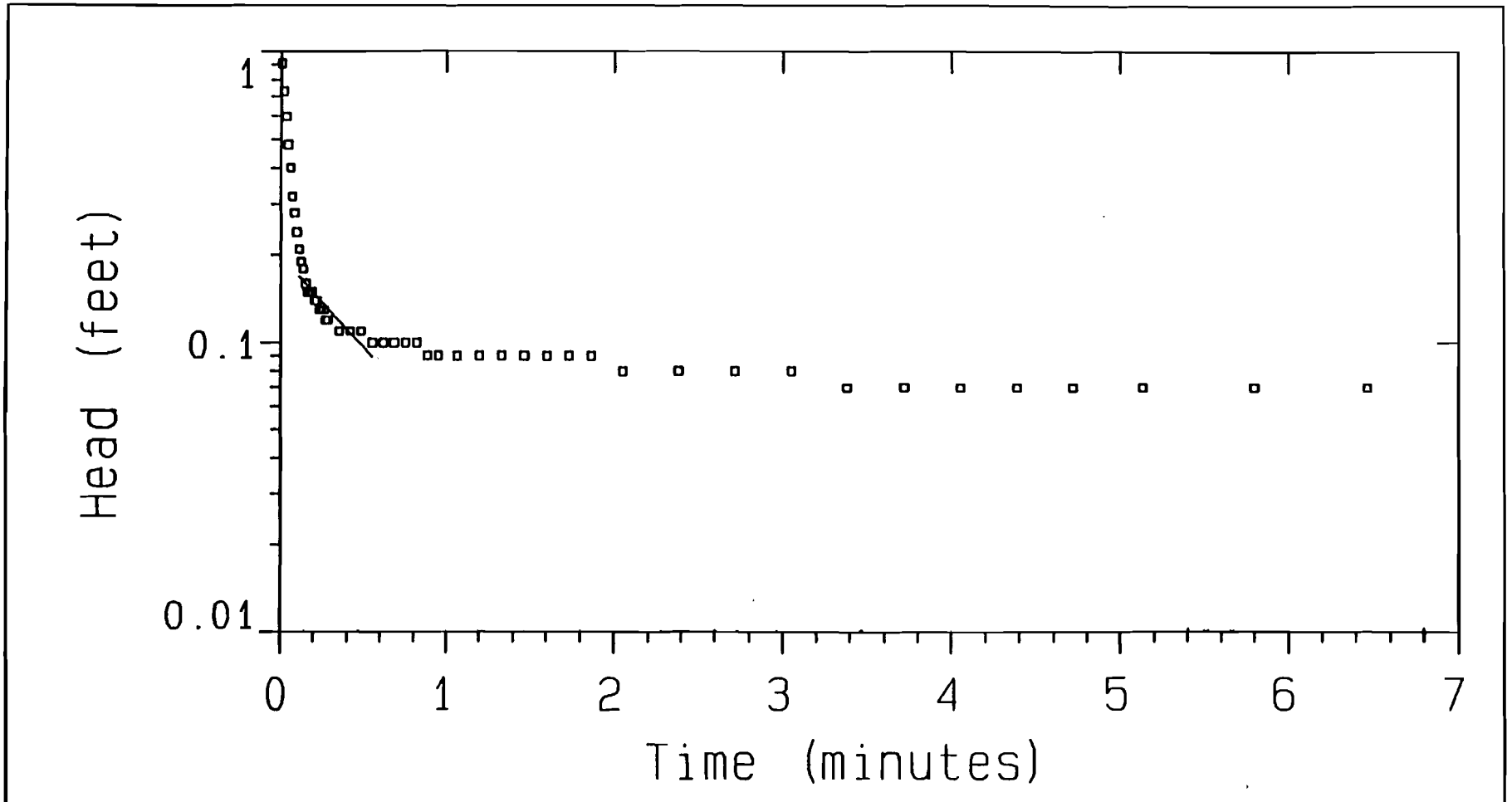
MODEL TYPE: BOUWER and RICE	for: U.S. Army Corps of Engineers	Slug Test Data (Slug-In)
CONDUCTIVITY: .001840 ft/min	by: Environmental Science & Engineering	
TRANSMISSIVITY: .07768 sq. ft/min	WELL DATA: Units: ft	Well: HMW-3
INITIAL HEAD: 1.340 ft	AQUIFER: Water Table	Hunter A.A.F.
a Set: HMW3-1I | Date: 08/06/92	THICKNESS: 42.20	Savannah, G
	SCREEN: top: 39.00 base: 49.00	
	DIAMETER: casing: 1666 intake: 1.708	
	DEPTH: Water Tab 9.300 TD: 49.00	



MODEL TYPE: BOUWER and RICE	for: U.S. Army Corps of Engineers	Slug Test Data (Slug-Out)
CONDUCTIVITY: .001691 ft/min	by: Environmental Science & Engineering	Well: HMW-3
TRANSMISSIVITY: .07137 sq. ft/min	WELL DATA: Units: ft	Hunter A.A.F.
INITIAL HEAD: 1.110 ft	AQUIFER: Water Table	Savannah, GA
Data Set: HMW3-10 / Date: 08/06/92	THICKNESS: 42.20	
	SCREEN: top: 39.00 base: 49.00	
	DIAMETER: casing: .1666 intake: 1.708	
	DEPTH: Water Table: 9.300 TD: 49.00	



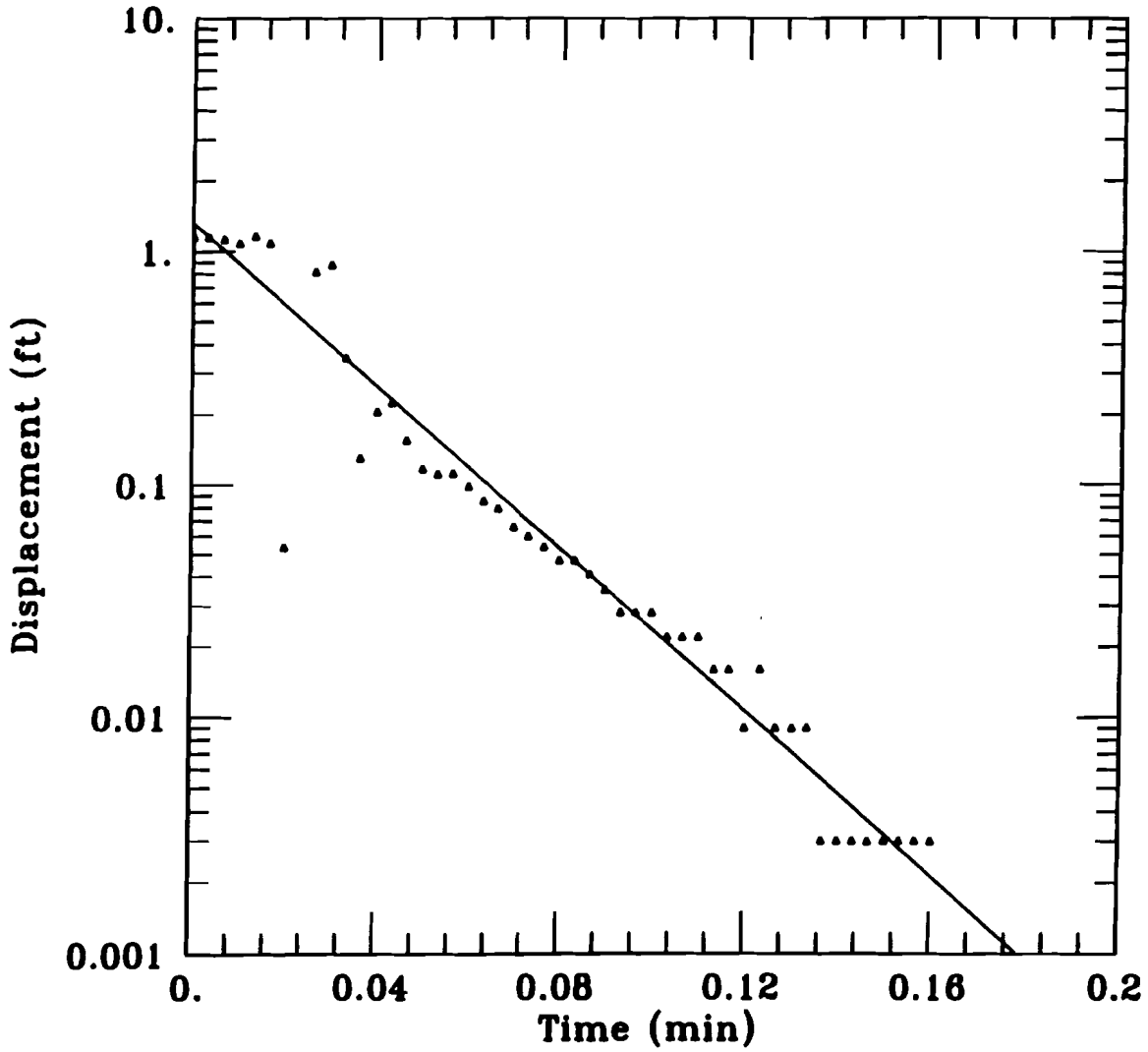
MODEL TYPE: BOUWER and RICE	for: U.S. Army Corps of Engineers	Slug Test Data (Slug-Out)
CONDUCTIVITY: .001110 ft/min	by: Environmental Science & Engineering	
TRANSMISSIVITY: .006859 sq. ft/min	WELL DATA: Units: ft	Well: HMW-4
INITIAL HEAD: .9700 ft	AQUIFER: Water Table	Hunter A.A.F.
Data Set: HMW4-10 / Date: 08/06/92	THICKNESS: 6.180	Savannah, G
	SCREEN: top: 3.000 base: 13.00	
	DIAMETER: casing .1666 intake: 1.708	
	DEPTH: Water Tab 9.320 TD: 13.00	



MODEL TYPE: BOUWER and RICE	for: U.S. Army Corps of Engineers	Slug Test Data (Slug-Out)
CONDUCTIVITY: .001546 ft/min	by: Environmental Science & Engineering	
TRANSMISSIVITY: .009556 sq. ft/min	WELL DATA: Units: ft	Well: HMW-4
INITIAL HEAD: .9100 ft	AQUIFER: Water Table	Hunter A.A.F.
Data Set: HMW4-20 / Date: 08/06/92	THICKNESS: 6.180	Savannah, GA
	SCREEN: top: 3.000 base: 13.00	
	DIAMETER: casing: .1666 intake: 1.708	
	DEPTH: Water Table: 9.320 TD: 13.00	

Client: ARMY CORPS OF ENGINEERS	Company: LAW ENG. & ENV. SVCS INC.
Location: SAVANNAH GA	Project: 11-3551-0320

HUNTER ARMY AIRFIELD



DATA SET:
HMW10-I.DAT
11/30/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 10/10/95
test well: HMW-10, IN

TEST DATA:
H0 = 1.156 ft
rc = 0.08333 ft
rw = 0.3438 ft
L = 8.08 ft
b = 8.08 ft
H = 7.63 ft

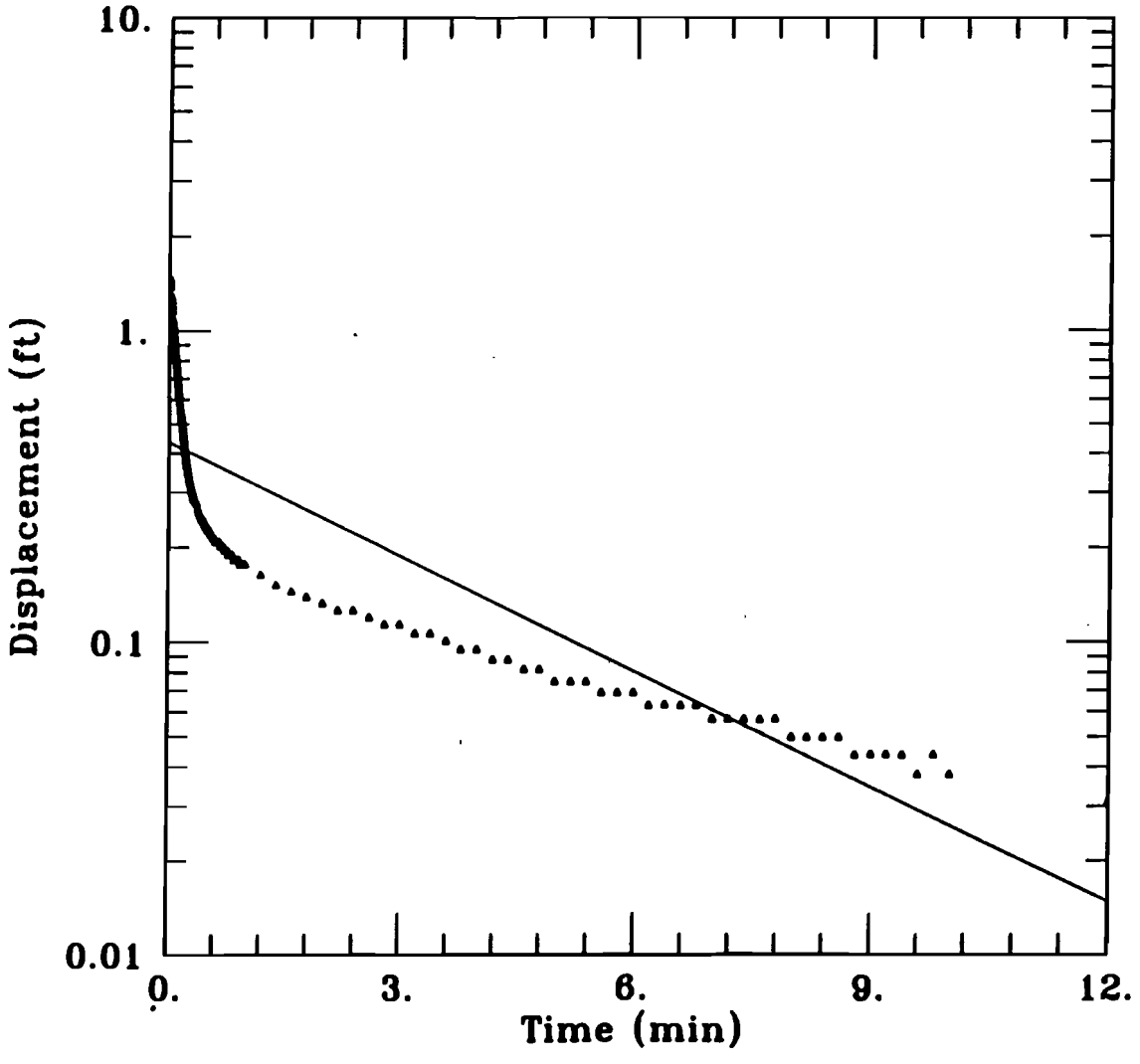
PARAMETER ESTIMATES:
K = 0.19 ft/min
y0 = 1.319 ft

AQTESOL

, 5/95

Client: ARMY CORPS OF ENGINEERS	Company: LAW ENG & ENV SVCS INC
Location: SAVANNAH, GA	Project: 11-3551-0320

HUNTER ARMY AIRFIELD



DATA SET:
HMW10-O.DAT
12/19/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 10/10/95
test well: HMW-10, OUT

TEST DATA:
H0 = 1.475 ft
rc = 0.08333 ft
rw = 0.3438 ft
L = 8.08 ft
b = 8.08 ft
H = 7.63 ft

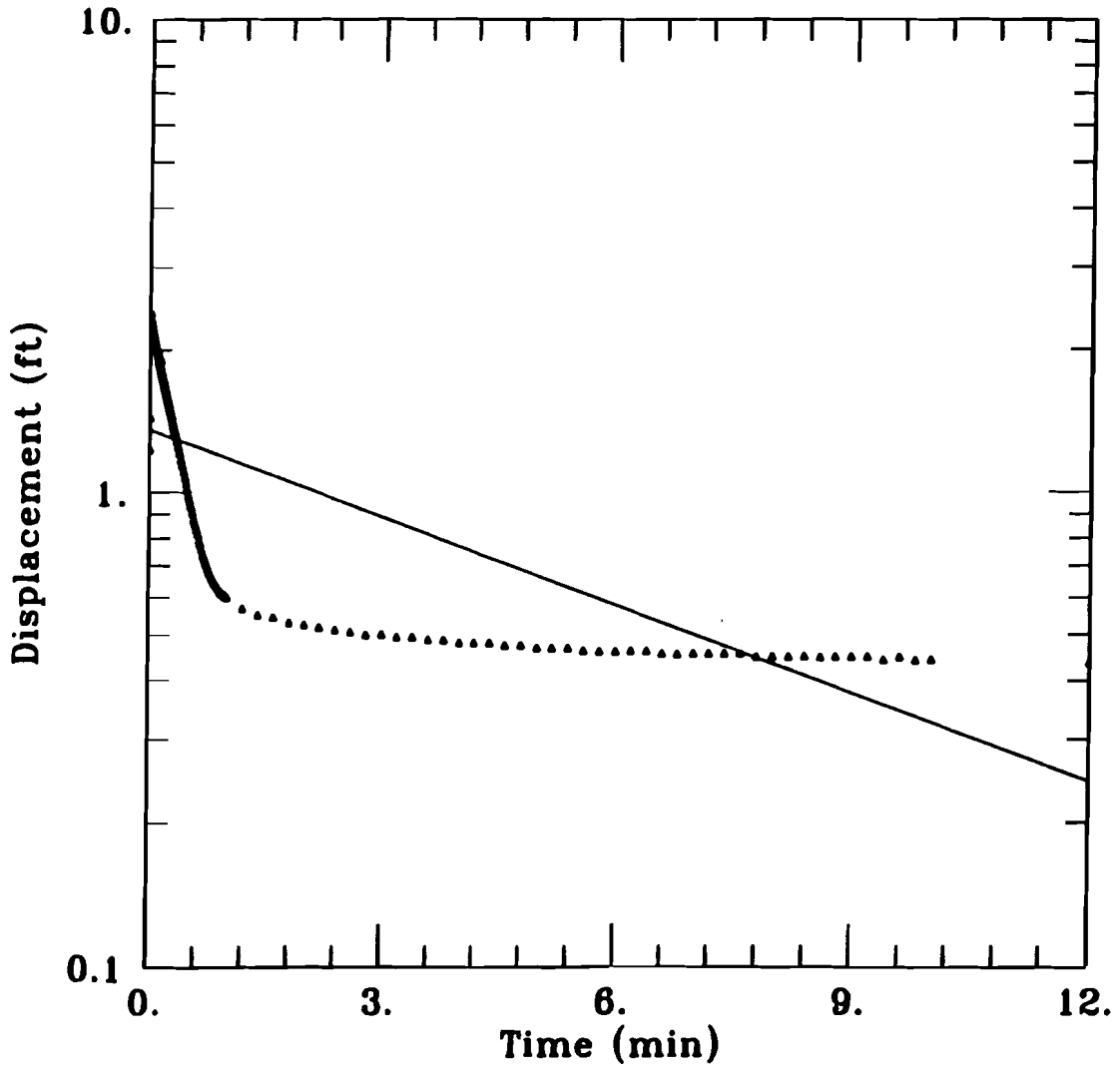
PARAMETER ESTIMATES:
K = 0.001334 ft/min
y0 = 0.4367 ft

AQTESOL

JCA 12/19/95

Client: ARMY CORPS OF ENGINEERS	Company: LAW ENG & ENV SVCS INC
Location: SAVANNAH GA	Project: 11-3551-0320

HUNTER ARMY AIRFIELD



DATA SET:
HMW11-O.DAT
12/19/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 10/09/95
test well: HMW-11. OUT

TEST DATA:
H0 = 2.404 ft
rc = 0.08333 ft
rw = 0.3438 ft
L = 6.43 ft
b = 15. ft
H = 11.21 ft

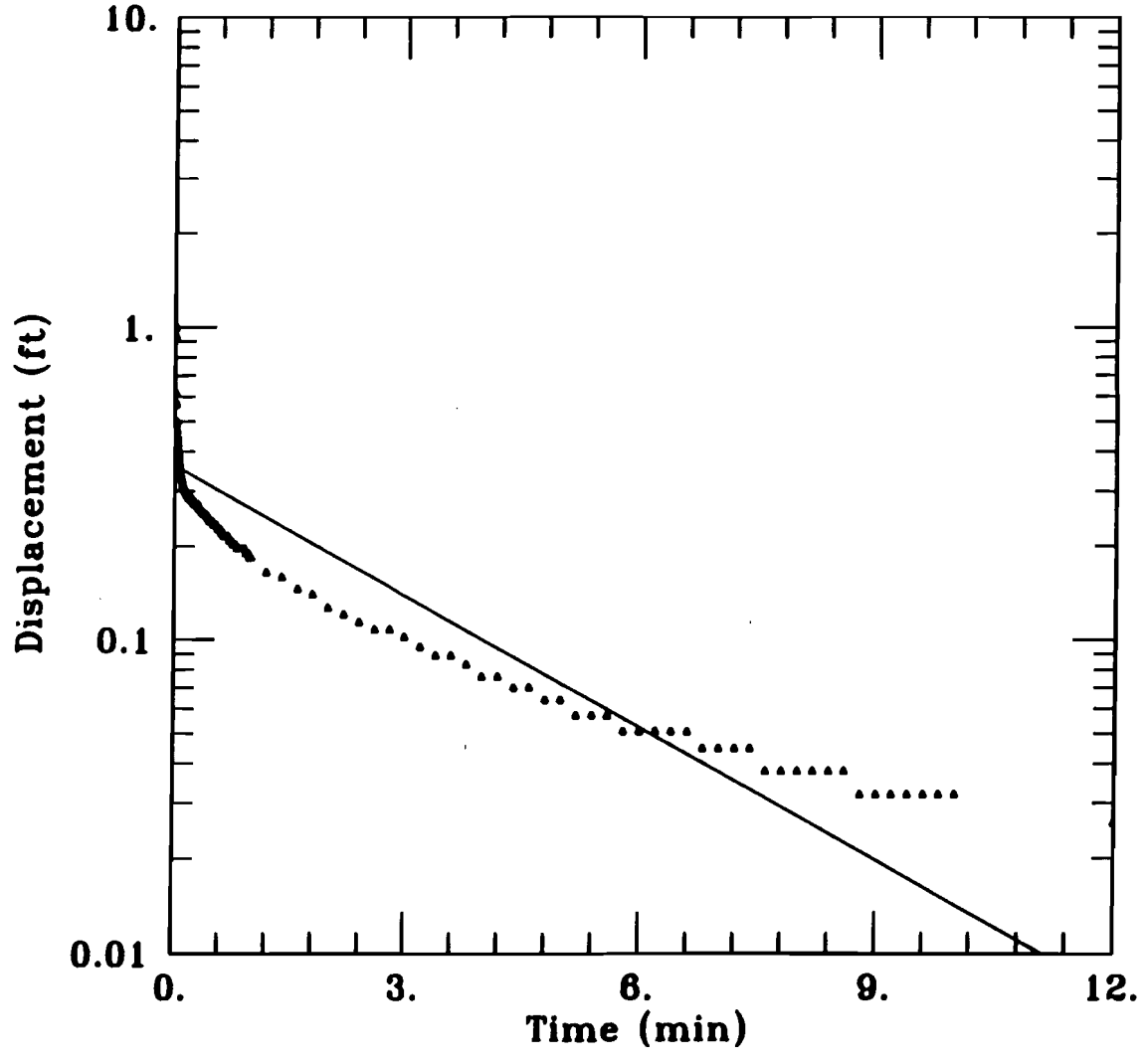
PARAMETER ESTIMATES:
K = 0.0008195 ft/min
y0 = 1.358 ft

AQTESOL

JCH 12/19/95

Client: ARMY CORPS OF ENGINEERS	Company: LAW ENG & ENV SVCS INC
Location: SAVANNAH GA	Project: 11-3551-0320

HUNTER ARMY AIRFIELD



DATA SET:
HMW12-I.DAT
12/19/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 10/09/95
test well: HMW-12, IN

TEST DATA:
H0 = 1.001 ft
rc = 0.08333 ft
rw = 0.3428 ft
L = 6.52 ft
b = 15. ft
H = 11.59 ft

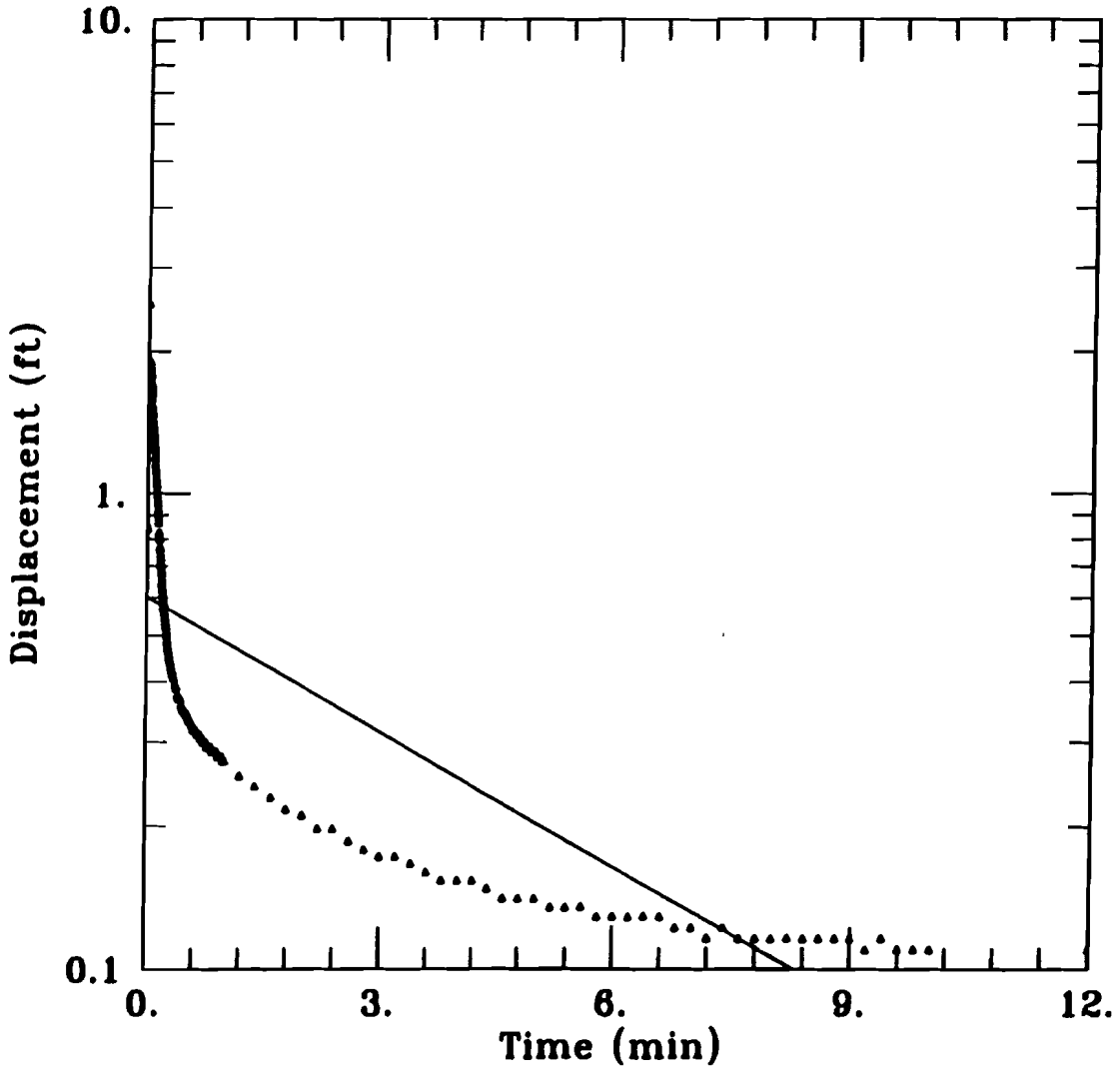
PARAMETER ESTIMATES:
K = 0.001848 ft/min
y0 = 0.363 ft

AQTESOL

jcd 12/19/95

Client: ARMY CORPS OF ENGINNERS	Company: LAW ENG & ENV SVCS INC
Location: SAVANNAH GA	Project: 11-3551-0320

HUNTER ARMY AIRFIELD



DATA SET:
HMW12-0.DAT
12/19/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 10/09/95
test well: HMW-12

TEST DATA:
H0 = 1.907 ft
rc = 0.08333 ft
rw = 0.3428 ft
L = 6.52 ft
b = 15. ft
H = 11.59 ft

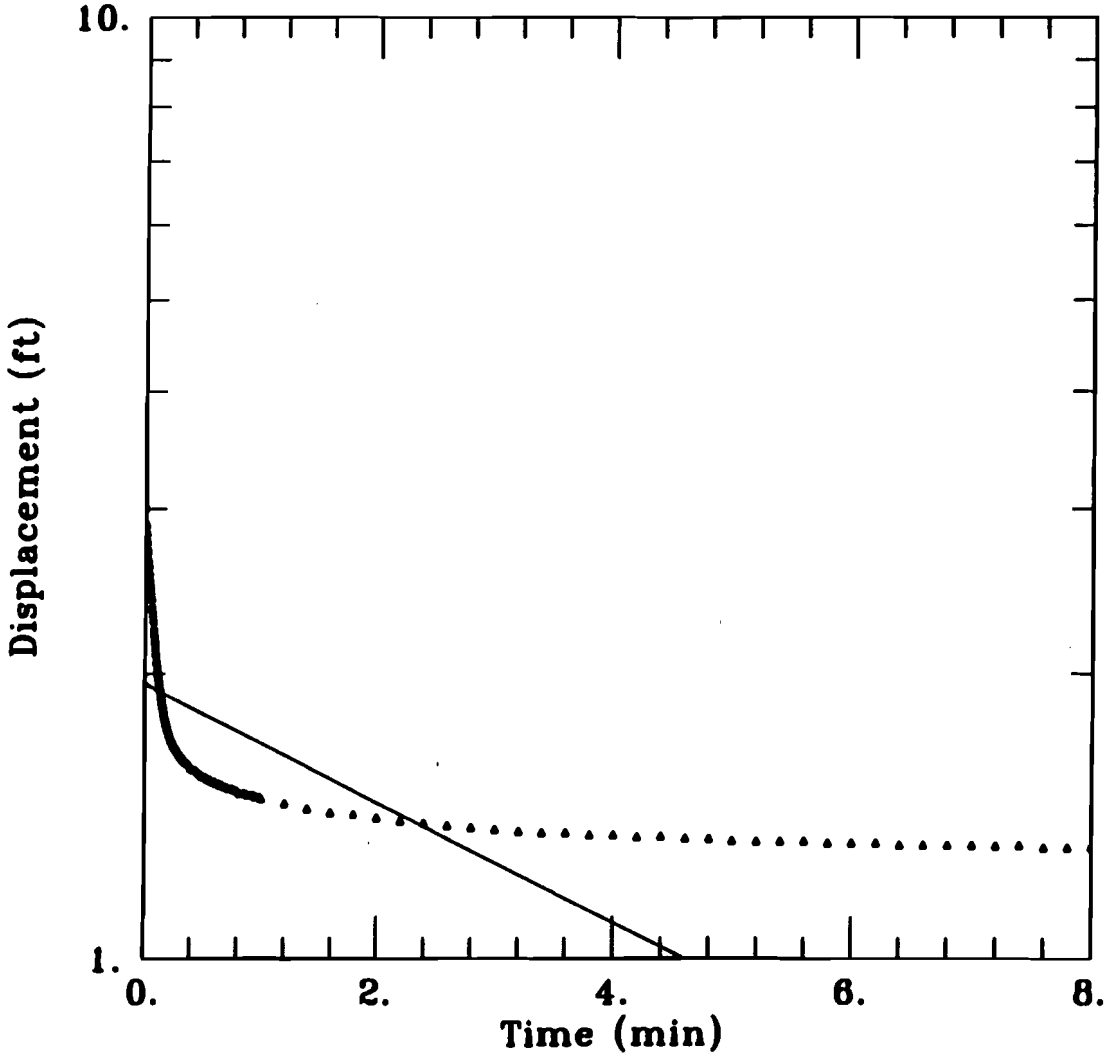
PARAMETER ESTIMATES:
K = 0.001241 ft/min
y0 = 0.6024 ft

AQTESOL

JCA 12/19/95

Client: ARMY CORPS OF ENGINEERS	Company: LAW ENG & ENV SVCS
Location: SAVANNAH GA	Project: 11-3551-0320

HUNTER ARMY AIRFIELD



DATA SET:
HMW13-0.DAT
12/19/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 10/10/95
test well: HMW-13, OUT

TEST DATA:
H0 = 3.014 ft
rc = 0.08333 ft
rw = 0.3438 ft
L = 7.28 ft
b = 15. ft
H = 12.93 ft

PARAMETER ESTIMATES:
K = 0.0007968 ft/min
y0 = 1.95 ft

AQTESOL

jcd 12/19/95

APPENDIX N

ProUCL Input and Output

Constituent	Original Data	Result	D_Result	Location ID
Benz(a)anthracene	< 370 U	370	0	FTASB-04
Benz(a)anthracene	170 J	170	1	FTASB-06
Benz(a)anthracene	< 420 U	420	0	FTASB-09
Benz(a)anthracene	160 JQ	160	1	FTASB-13
Benz(a)anthracene	930	930	1	FTASB-14
Benz(a)anthracene	730	730	1	FTASB-15
Benz(a)anthracene	< 350 U	350	0	FTASB-16
Benz(a)anthracene	630	630	1	FTASB-17
Benz(a)anthracene	340 JQ	340	1	HMW-10
Benz(a)anthracene	840	840	1	HMW-12
Benz(a)anthracene	< 360 U	360	0	HMW-14
Benz(a)anthracene	< 340 U	340	0	HMW-14R
Benz(a)anthracene	< 380 U	380	0	HMW-15
Benz(a)anthracene	34000	34000	1	HMW-16A
Benz(a)anthracene	< 360 U	360	0	HMW-17
Benz(a)anthracene	< 420 U	420	0	HMW-18
Benz(a)anthracene	370	370	1	PSB-1
Benz(a)anthracene	170	170	1	PSB-2
Benz(a)anthracene	140	140	1	PSB-2
Benz(a)anthracene	5300	5300	1	PSB-3
Benz(a)anthracene	< 110 U	110	0	PSB-5
Benz(a)anthracene	< 340 U	340	0	SB-018
Benz(a)anthracene	< 370 U	370	0	SB-019
Benz(a)anthracene	< 360 U	360	0	SB-020
Benz(a)anthracene	< 340 U	340	0	SB-021
Benz(a)anthracene	< 400 U	400	0	SB-022
Benz(a)anthracene	510	510	1	SB-023
Benz(a)anthracene	< 480 U	480	0	SB-024
Benz(a)anthracene	7400	7400	1	SB-025
Benz(a)anthracene	6800	6800	1	SB-026
Benz(a)anthracene	17000	17000	1	SB-027
Benz(a)anthracene	< 370 U	370	0	SB-028
Benz(a)anthracene	< 360 U	360	0	SB-029
Benz(a)anthracene	< 350 U	350	0	SB-030
Benz(a)anthracene	< 360 U	360	0	SB-035
Benz(a)anthracene	8700	8700	1	SB-036
Benz(a)anthracene	< 370 U	370	0	SB-037
Benz(a)anthracene	15000	15000	1	SB-038
Benz(a)anthracene	< 430 U	430	0	SB-041
Benz(a)anthracene	< 440 U	440	0	SB-042
Benz(a)anthracene	< 350 U	350	0	SB-043
Benz(a)anthracene	< 340 UJL	340	0	SB-045
Benz(a)anthracene	< 330 UJL	330	0	SB-049
Benz(a)anthracene	< 340 U	340	0	SB-050
Benzo(a)pyrene	< 370 U	370	0	FTASB-04
Benzo(a)pyrene	240 JL	240	1	FTASB-06
Benzo(a)pyrene	< 420 JL	420	0	FTASB-09
Benzo(a)pyrene	160 JQ	160	1	FTASB-13
Benzo(a)pyrene	1200	1200	1	FTASB-14
Benzo(a)pyrene	790	790	1	FTASB-15
Benzo(a)pyrene	< 350 U	350	0	FTASB-16
Benzo(a)pyrene	760	760	1	FTASB-17
Benzo(a)pyrene	300 JQ	300	1	HMW-10
Benzo(a)pyrene	910	910	1	HMW-12
Benzo(a)pyrene	< 360 U	360	0	HMW-14
Benzo(a)pyrene	< 340 U	340	0	HMW-14R
Benzo(a)pyrene	< 380 U	380	0	HMW-15
Benzo(a)pyrene	26000	26000	1	HMW-16A
Benzo(a)pyrene	< 360 U	360	0	HMW-17
Benzo(a)pyrene	< 420 U	420	0	HMW-18
Benzo(a)pyrene	320	320	1	PSB-1
Benzo(a)pyrene	220	220	1	PSB-2
Benzo(a)pyrene	180	180	1	PSB-2
Benzo(a)pyrene	4800	4800	1	PSB-3
Benzo(a)pyrene	< 150 U	150	0	PSB-5
Benzo(a)pyrene	< 340 U	340	0	SB-018
Benzo(a)pyrene	< 370 U	370	0	SB-019
Benzo(a)pyrene	< 360 U	360	0	SB-020
Benzo(a)pyrene	< 340 U	340	0	SB-021
Benzo(a)pyrene	< 400 U	400	0	SB-022
Benzo(a)pyrene	750	750	1	SB-023
Benzo(a)pyrene	< 480 U	480	0	SB-024
Benzo(a)pyrene	6200	6200	1	SB-025
Benzo(a)pyrene	5200	5200	1	SB-026
Benzo(a)pyrene	16000	16000	1	SB-027
Benzo(a)pyrene	< 370 U	370	0	SB-028
Benzo(a)pyrene	< 360 U	360	0	SB-029

Constituent	Original Data	Result	D_Result	Location ID
Benzo(a)pyrene	< 350 U	350	0	SB-030
Benzo(a)pyrene	< 360 U	360	0	SB-035
Benzo(a)pyrene	8900	8900	1	SB-036
Benzo(a)pyrene	< 370 U	370	0	SB-037
Benzo(a)pyrene	9900	9900	1	SB-038
Benzo(a)pyrene	< 430 U	430	0	SB-041
Benzo(a)pyrene	< 440 U	440	0	SB-042
Benzo(a)pyrene	< 350 U	350	0	SB-043
Benzo(a)pyrene	< 340 UJL	340	0	SB-045
Benzo(a)pyrene	< 330 UJL	330	0	SB-049
Benzo(a)pyrene	< 340 U	340	0	SB-050
Benzo(b)fluoranthene	< 370 U	370	0	FTASB-04
Benzo(b)fluoranthene	470 LJL	470	1	FTASB-06
Benzo(b)fluoranthene	< 420 JL	420	0	FTASB-09
Benzo(b)fluoranthene	320 JQ	320	1	FTASB-13
Benzo(b)fluoranthene	2600	2600	1	FTASB-14
Benzo(b)fluoranthene	2200	2200	1	FTASB-15
Benzo(b)fluoranthene	< 350 U	350	0	FTASB-16
Benzo(b)fluoranthene	2000	2000	1	FTASB-17
Benzo(b)fluoranthene	720	720	1	HMW-10
Benzo(b)fluoranthene	1800	1800	1	HMW-12
Benzo(b)fluoranthene	< 360 U	360	0	HMW-14
Benzo(b)fluoranthene	< 340 U	340	0	HMW-14R
Benzo(b)fluoranthene	< 380 U	380	0	HMW-15
Benzo(b)fluoranthene	28000	28000	1	HMW-16A
Benzo(b)fluoranthene	< 360 U	360	0	HMW-17
Benzo(b)fluoranthene	< 420 U	420	0	HMW-18
Benzo(b)fluoranthene	560	560	1	PSB-1
Benzo(b)fluoranthene	370	370	1	PSB-2
Benzo(b)fluoranthene	160	160	1	PSB-2
Benzo(b)fluoranthene	6900	6900	1	PSB-3
Benzo(b)fluoranthene	< 110 U	110	0	PSB-5
Benzo(b)fluoranthene	< 340 U	340	0	SB-018
Benzo(b)fluoranthene	< 370 U	370	0	SB-019
Benzo(b)fluoranthene	< 360 U	360	0	SB-020
Benzo(b)fluoranthene	< 340 U	340	0	SB-021
Benzo(b)fluoranthene	< 400 U	400	0	SB-022
Benzo(b)fluoranthene	740	740	1	SB-023
Benzo(b)fluoranthene	< 480 U	480	0	SB-024
Benzo(b)fluoranthene	7000	7000	1	SB-025
Benzo(b)fluoranthene	5800	5800	1	SB-026
Benzo(b)fluoranthene	17000	17000	1	SB-027
Benzo(b)fluoranthene	< 370 U	370	0	SB-028
Benzo(b)fluoranthene	< 360 U	360	0	SB-029
Benzo(b)fluoranthene	< 350 U	350	0	SB-030
Benzo(b)fluoranthene	< 360 U	360	0	SB-035
Benzo(b)fluoranthene	8700	8700	1	SB-036
Benzo(b)fluoranthene	< 370 U	370	0	SB-037
Benzo(b)fluoranthene	8600	8600	1	SB-038
Benzo(b)fluoranthene	< 430 U	430	0	SB-041
Benzo(b)fluoranthene	< 440 U	440	0	SB-042
Benzo(b)fluoranthene	< 350 U	350	0	SB-043
Benzo(b)fluoranthene	< 340 UJL	340	0	SB-045
Benzo(b)fluoranthene	< 330 UJL	330	0	SB-049
Benzo(b)fluoranthene	< 340 U	340	0	SB-050
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-04
Benzo(k)fluoranthene	< 340 JL	340	0	FTASB-06
Benzo(k)fluoranthene	< 420 JL	420	0	FTASB-09
Benzo(k)fluoranthene	< 360 U	360	0	FTASB-13
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-14
Benzo(k)fluoranthene	< 360 U	360	0	FTASB-15
Benzo(k)fluoranthene	< 350 U	350	0	FTASB-16
Benzo(k)fluoranthene	< 350 U	350	0	FTASB-17
Benzo(k)fluoranthene	< 370 U	370	0	HMW-10
Benzo(k)fluoranthene	< 400 U	400	0	HMW-12
Benzo(k)fluoranthene	< 360 U	360	0	HMW-14
Benzo(k)fluoranthene	< 340 U	340	0	HMW-14R
Benzo(k)fluoranthene	< 380 U	380	0	HMW-15
Benzo(k)fluoranthene	27000	27000	1	HMW-16A
Benzo(k)fluoranthene	< 360 U	360	0	HMW-17
Benzo(k)fluoranthene	< 420 U	420	0	HMW-18
Benzo(k)fluoranthene	250	250	1	PSB-1
Benzo(k)fluoranthene	150	150	1	PSB-2
Benzo(k)fluoranthene	150	150	1	PSB-2
Benzo(k)fluoranthene	2700	2700	1	PSB-3
Benzo(k)fluoranthene	< 110 U	110	0	PSB-5
Benzo(k)fluoranthene	< 340 U	340	0	SB-018

Constituent	Original Data	Result	D_Result	Location ID
Benzo(k)fluoranthene	< 370 U	370	0	SB-019
Benzo(k)fluoranthene	< 360 U	360	0	SB-020
Benzo(k)fluoranthene	< 340 U	340	0	SB-021
Benzo(k)fluoranthene	< 400 U	400	0	SB-022
Benzo(k)fluoranthene	630	630	1	SB-023
Benzo(k)fluoranthene	< 480 U	480	0	SB-024
Benzo(k)fluoranthene	5600	5600	1	SB-025
Benzo(k)fluoranthene	4900	4900	1	SB-026
Benzo(k)fluoranthene	14000	14000	1	SB-027
Benzo(k)fluoranthene	< 370 U	370	0	SB-028
Benzo(k)fluoranthene	< 360 U	360	0	SB-029
Benzo(k)fluoranthene	< 350 U	350	0	SB-030
Benzo(k)fluoranthene	< 360 U	360	0	SB-035
Benzo(k)fluoranthene	8600	8600	1	SB-036
Benzo(k)fluoranthene	< 370 U	370	0	SB-037
Benzo(k)fluoranthene	9400	9400	1	SB-038
Benzo(k)fluoranthene	< 430 U	430	0	SB-041
Benzo(k)fluoranthene	< 440 U	440	0	SB-042
Benzo(k)fluoranthene	< 350 U	350	0	SB-043
Benzo(k)fluoranthene	< 340 UJL	340	0	SB-045
Benzo(k)fluoranthene	< 330 UJL	330	0	SB-049
Benzo(k)fluoranthene	< 340 U	340	0	SB-050
Chromium	3000	3000	1	FTASB-04
Chromium	5100	5100	1	FTASB-06
Chromium	2400	2400	1	FTASB-09
Chromium	5700	5700	1	FTASB-13
Chromium	4400	4400	1	FTASB-14
Chromium	4100	4100	1	FTASB-15
Chromium	3400	3400	1	FTASB-16
Chromium	4700	4700	1	FTASB-17
Chromium	4000	4000	1	HA01-MW-09
Chromium	2000	2000	1	HA01-MW-10
Chromium	3200	3200	1	HA01-MW-11
Chromium	1700	1700	1	HA01-MW-12
Chromium	910	910	1	HA01-MW-13
Chromium	8600	8600	1	HA01-MW-14
Chromium	6800	6800	1	HA01-MW-15
Chromium	3000	3000	1	HA01-MW-16
Chromium	1800	1800	1	HA01-MW-17
Chromium	2600	2600	1	HA01SB005
Chromium	7700	7700	1	HMW-10
Chromium	3600 JQ	3600	1	HMW-12
Chromium	5610	5610	1	PSB-1
Chromium	5880	5880	1	PSB-2
Chromium	6640	6640	1	PSB-2
Chromium	3550	3550	1	PSB-3
Chromium	3680	3680	1	PSB-5
Chromium	2400	2400	1	SB-043
Dibenz(a,h)anthracene	< 370 U	370	0	FTASB-04
Dibenz(a,h)anthracene	< 340 JL	340	0	FTASB-06
Dibenz(a,h)anthracene	< 420 JL	420	0	FTASB-09
Dibenz(a,h)anthracene	< 360 U	360	0	FTASB-13
Dibenz(a,h)anthracene	< 370 U	370	0	FTASB-14
Dibenz(a,h)anthracene	200 JQ	200	1	FTASB-15
Dibenz(a,h)anthracene	< 350 U	350	0	FTASB-16
Dibenz(a,h)anthracene	91 JQ	91	1	FTASB-17
Dibenz(a,h)anthracene	< 370 U	370	0	HMW-10
Dibenz(a,h)anthracene	160 JQ	160	1	HMW-12
Dibenz(a,h)anthracene	< 360 U	360	0	HMW-14
Dibenz(a,h)anthracene	< 340 U	340	0	HMW-14R
Dibenz(a,h)anthracene	< 380 U	380	0	HMW-15
Dibenz(a,h)anthracene	< 3500 U	3500	0	HMW-16A
Dibenz(a,h)anthracene	< 360 U	360	0	HMW-17
Dibenz(a,h)anthracene	< 420 U	420	0	HMW-18
Dibenz(a,h)anthracene	< 180 U	180	0	PSB-1
Dibenz(a,h)anthracene	< 180 U	180	0	PSB-2
Dibenz(a,h)anthracene	< 160 U	160	0	PSB-2
Dibenz(a,h)anthracene	< 870 U	870	0	PSB-3
Dibenz(a,h)anthracene	< 170 U	170	0	PSB-5
Dibenz(a,h)anthracene	< 340 U	340	0	SB-018
Dibenz(a,h)anthracene	< 370 U	370	0	SB-019
Dibenz(a,h)anthracene	< 360 U	360	0	SB-020
Dibenz(a,h)anthracene	< 340 U	340	0	SB-021
Dibenz(a,h)anthracene	< 400 U	400	0	SB-022
Dibenz(a,h)anthracene	< 360 U	360	0	SB-023
Dibenz(a,h)anthracene	< 480 U	480	0	SB-024
Dibenz(a,h)anthracene	1800	1800	1	SB-025

Constituent	Original Data	Result	D_Result	Location ID
Dibenz(a,h)anthracene	470	470	1	SB-026
Dibenz(a,h)anthracene	3900	3900	1	SB-027
Dibenz(a,h)anthracene	< 370 U	370	0	SB-028
Dibenz(a,h)anthracene	< 360 U	360	0	SB-029
Dibenz(a,h)anthracene	< 350 U	350	0	SB-030
Dibenz(a,h)anthracene	< 360 U	360	0	SB-035
Dibenz(a,h)anthracene	< 360 U	360	0	SB-036
Dibenz(a,h)anthracene	< 370 U	370	0	SB-037
Dibenz(a,h)anthracene	3100	3100	1	SB-038
Dibenz(a,h)anthracene	< 430 U	430	0	SB-041
Dibenz(a,h)anthracene	< 440 U	440	0	SB-042
Dibenz(a,h)anthracene	< 350 U	350	0	SB-043
Dibenz(a,h)anthracene	< 340 UJL	340	0	SB-045
Dibenz(a,h)anthracene	< 330 UJL	330	0	SB-049
Dibenz(a,h)anthracene	< 340 U	340	0	SB-050
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	FTASB-04
Indeno(1,2,3-cd)pyrene	190 JL	190	1	FTASB-06
Indeno(1,2,3-cd)pyrene	< 420 JL	420	0	FTASB-09
Indeno(1,2,3-cd)pyrene	92 JQ	92	1	FTASB-13
Indeno(1,2,3-cd)pyrene	790	790	1	FTASB-14
Indeno(1,2,3-cd)pyrene	600	600	1	FTASB-15
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	FTASB-16
Indeno(1,2,3-cd)pyrene	520	520	1	FTASB-17
Indeno(1,2,3-cd)pyrene	210 JQ	210	1	HMW-10
Indeno(1,2,3-cd)pyrene	440	440	1	HMW-12
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	HMW-14
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	HMW-14R
Indeno(1,2,3-cd)pyrene	< 380 U	380	0	HMW-15
Indeno(1,2,3-cd)pyrene	16000	16000	1	HMW-16A
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	HMW-17
Indeno(1,2,3-cd)pyrene	< 420 U	420	0	HMW-18
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-1
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-2
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-2
Indeno(1,2,3-cd)pyrene	< 870 U	870	0	PSB-3
Indeno(1,2,3-cd)pyrene	< 170 U	170	0	PSB-5
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	SB-018
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-019
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	SB-020
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	SB-021
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	SB-022
Indeno(1,2,3-cd)pyrene	520	520	1	SB-023
Indeno(1,2,3-cd)pyrene	< 480 U	480	0	SB-024
Indeno(1,2,3-cd)pyrene	4600	4600	1	SB-025
Indeno(1,2,3-cd)pyrene	3500	3500	1	SB-026
Indeno(1,2,3-cd)pyrene	11000	11000	1	SB-027
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-028
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	SB-029
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-030
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	SB-035
Indeno(1,2,3-cd)pyrene	5700	5700	1	SB-036
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-037
Indeno(1,2,3-cd)pyrene	5600 J	5600	1	SB-038
Indeno(1,2,3-cd)pyrene	< 430 U	430	0	SB-041
Indeno(1,2,3-cd)pyrene	< 440 U	440	0	SB-042
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-043
Indeno(1,2,3-cd)pyrene	< 340 UJL	340	0	SB-045
Indeno(1,2,3-cd)pyrene	< 330 UJL	330	0	SB-049
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	SB-050

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.14/19/2019 9:56:22 AM
From File	RI-FS Appendix A - ALL Soil Analytical Results_new criteria_SBO 4-2019.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result (benz(a)anthracene)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	27
Number of Detects	18	Number of Non-Detects	26
Number of Distinct Detects	17	Number of Distinct Non-Detects	12
Minimum Detect	140	Minimum Non-Detect	110
Maximum Detect	34000	Maximum Non-Detect	480
Variance Detects	78311994	Percent Non-Detects	59.09%
Mean Detects	5511	SD Detects	8849
Median Detects	785	CV Detects	1.606
Skewness Detects	2.301	Kurtosis Detects	5.842
Mean of Logged Detects	7.225	SD of Logged Detects	1.841

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.669	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.309	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2350	KM Standard Error of Mean	945.9
KM SD	6097	95% KM (BCA) UCL	4165
95% KM (t) UCL	3940	95% KM (Percentile Bootstrap) UCL	3932
95% KM (z) UCL	3906	95% KM Bootstrap t UCL	5445
90% KM Chebyshev UCL	5188	95% KM Chebyshev UCL	6473
97.5% KM Chebyshev UCL	8257	99% KM Chebyshev UCL	11761

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.021	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.808	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.272	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.216	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.463	k star (bias corrected MLE)	0.423
Theta hat (MLE)	11911	Theta star (bias corrected MLE)	13041
nu hat (MLE)	16.65	nu star (bias corrected)	15.21
Mean (detects)	5511		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2254
Maximum	34000	Median	0.01
SD	6203	CV	2.751
k hat (MLE)	0.107	k star (bias corrected MLE)	0.115
Theta hat (MLE)	20973	Theta star (bias corrected MLE)	19550
nu hat (MLE)	9.459	nu star (bias corrected)	10.15
Adjusted Level of Significance (β)	0.0445		
Approximate Chi Square Value (10.15, α)	4.034	Adjusted Chi Square Value (10.15, β)	3.903
95% Gamma Approximate UCL (use when n>=50)	5671	95% Gamma Adjusted UCL (use when n<50)	5860

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2350	SD (KM)	6097
Variance (KM)	37173459	SE of Mean (KM)	945.9
k hat (KM)	0.149	k star (KM)	0.154
nu hat (KM)	13.08	nu star (KM)	13.52
theta hat (KM)	15817	theta star (KM)	15300
80% gamma percentile (KM)	2608	90% gamma percentile (KM)	6991
95% gamma percentile (KM)	12875	99% gamma percentile (KM)	29866

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.52, α)	6.242	Adjusted Chi Square Value (13.52, β)	6.074
95% Gamma Approximate KM-UCL (use when n>=50)	5089	95% Gamma Adjusted KM-UCL (use when n<50)	5230

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.195	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2323	Mean in Log Scale	5.516
SD in Original Scale	6178	SD in Log Scale	2.01
95% t UCL (assumes normality of ROS data)	3888	95% Percentile Bootstrap UCL	3949
95% BCA Bootstrap UCL	4561	95% Bootstrap t UCL	5563
95% H-UCL (Log ROS)	5808		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.937	KM Geo Mean	378.9
KM SD (logged)	1.581	95% Critical H Value (KM-Log)	3.089
KM Standard Error of Mean (logged)	0.252	95% H-UCL (KM -Log)	2787
KM SD (logged)	1.581	95% Critical H Value (KM-Log)	3.089
KM Standard Error of Mean (logged)	0.252		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2362	Mean in Log Scale	6.015
SD in Original Scale	6163	SD in Log Scale	1.554
95% t UCL (Assumes normality)	3924	95% H-Stat UCL	2822

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	6473

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(a)pyrene)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	30
Number of Detects	18	Number of Non-Detects	26
Number of Distinct Detects	18	Number of Distinct Non-Detects	12
Minimum Detect	160	Minimum Non-Detect	150
Maximum Detect	26000	Maximum Non-Detect	480
Variance Detects	48292509	Percent Non-Detects	59.09%
Mean Detects	4602	SD Detects	6949
Median Detects	850	CV Detects	1.51
Skewness Detects	2.12	Kurtosis Detects	4.684
Mean of Logged Detects	7.242	SD of Logged Detects	1.689

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.695	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.299	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2013	KM Standard Error of Mean	748.9
KM SD	4827	95% KM (BCA) UCL	3401
95% KM (t) UCL	3272	95% KM (Percentile Bootstrap) UCL	3246
95% KM (z) UCL	3245	95% KM Bootstrap t UCL	4285
90% KM Chebyshev UCL	4260	95% KM Chebyshev UCL	5278
97.5% KM Chebyshev UCL	6690	99% KM Chebyshev UCL	9465

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.894	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.798	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.234	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.215	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.528	k star (bias corrected MLE)	0.477
Theta hat (MLE)	8713	Theta star (bias corrected MLE)	9644
nu hat (MLE)	19.01	nu star (bias corrected)	17.18
Mean (detects)	4602		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1883
Maximum	26000	Median	0.01
SD	4933	CV	2.62
k hat (MLE)	0.11	k star (bias corrected MLE)	0.118
Theta hat (MLE)	17126	Theta star (bias corrected MLE)	16011
nu hat (MLE)	9.673	nu star (bias corrected)	10.35
Adjusted Level of Significance (β)	0.0445		
Approximate Chi Square Value (10.35, α)	4.16	Adjusted Chi Square Value (10.35, β)	4.027
95% Gamma Approximate UCL (use when n>=50)	4683	95% Gamma Adjusted UCL (use when n<50)	4837

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2013	SD (KM)	4827
Variance (KM)	23298818	SE of Mean (KM)	748.9
k hat (KM)	0.174	k star (KM)	0.177
nu hat (KM)	15.31	nu star (KM)	15.6
theta hat (KM)	11572	theta star (KM)	11357
80% gamma percentile (KM)	2474	90% gamma percentile (KM)	6067
95% gamma percentile (KM)	10689	99% gamma percentile (KM)	23680

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.60, α)	7.681	Adjusted Chi Square Value (15.60, β)	7.492
95% Gamma Approximate KM-UCL (use when n>=50)	4089	95% Gamma Adjusted KM-UCL (use when n<50)	4192

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.157	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2006	Mean in Log Scale	5.912
SD in Original Scale	4887	SD in Log Scale	1.7
95% t UCL (assumes normality of ROS data)	3244	95% Percentile Bootstrap UCL	3344
95% BCA Bootstrap UCL	3557	95% Bootstrap t UCL	4594
95% H-UCL (Log ROS)	3647		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	6.13	KM Geo Mean	459.6
KM SD (logged)	1.415	95% Critical H Value (KM-Log)	2.869
KM Standard Error of Mean (logged)	0.23	95% H-UCL (KM -Log)	2323
KM SD (logged)	1.415	95% Critical H Value (KM-Log)	2.869
KM Standard Error of Mean (logged)	0.23		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1990	Mean in Log Scale	6.029
SD in Original Scale	4891	SD in Log Scale	1.481
95% t UCL (Assumes normality)	3230	95% H-Stat UCL	2422

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	5278

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(b)fluoranthene)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	29
Number of Detects	18	Number of Non-Detects	26
Number of Distinct Detects	18	Number of Distinct Non-Detects	12
Minimum Detect	160	Minimum Non-Detect	110
Maximum Detect	28000	Maximum Non-Detect	480
Variance Detects	51961352	Percent Non-Detects	59.09%
Mean Detects	5219	SD Detects	7208
Median Detects	2100	CV Detects	1.381
Skewness Detects	2.24	Kurtosis Detects	5.479
Mean of Logged Detects	7.642	SD of Logged Detects	1.504

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.709	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2251	KM Standard Error of Mean	794.4
KM SD	5117	95% KM (BCA) UCL	3908
95% KM (t) UCL	3586	95% KM (Percentile Bootstrap) UCL	3720
95% KM (z) UCL	3557	95% KM Bootstrap t UCL	5014
90% KM Chebyshev UCL	4634	95% KM Chebyshev UCL	5713
97.5% KM Chebyshev UCL	7211	99% KM Chebyshev UCL	10155

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.479	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.786	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.166	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.213	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.663	k star (bias corrected MLE)	0.59
Theta hat (MLE)	7871	Theta star (bias corrected MLE)	8851
nu hat (MLE)	23.87	nu star (bias corrected)	21.23
Mean (detects)	5219		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2135
Maximum	28000	Median	0.01
SD	5223	CV	2.446
k hat (MLE)	0.11	k star (bias corrected MLE)	0.118
Theta hat (MLE)	19334	Theta star (bias corrected MLE)	18086
nu hat (MLE)	9.717	nu star (bias corrected)	10.39
Adjusted Level of Significance (β)	0.0445		
Approximate Chi Square Value (10.39, α)	4.186	Adjusted Chi Square Value (10.39, β)	4.053
95% Gamma Approximate UCL (use when n>=50)	5299	95% Gamma Adjusted UCL (use when n<50)	5473

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2251	SD (KM)	5117
Variance (KM)	26180231	SE of Mean (KM)	794.4
k hat (KM)	0.193	k star (KM)	0.195
nu hat (KM)	17.03	nu star (KM)	17.2
theta hat (KM)	11632	theta star (KM)	11515
80% gamma percentile (KM)	2930	90% gamma percentile (KM)	6806
95% gamma percentile (KM)	11666	99% gamma percentile (KM)	25098

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.20, α)	8.815	Adjusted Chi Square Value (17.20, β)	8.611
95% Gamma Approximate KM-UCL (use when n>=50)	4392	95% Gamma Adjusted KM-UCL (use when n<50)	4496

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.143	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2195	Mean in Log Scale	5.624
SD in Original Scale	5199	SD in Log Scale	2.083
95% t UCL (assumes normality of ROS data)	3512	95% Percentile Bootstrap UCL	3570
95% BCA Bootstrap UCL	4218	95% Bootstrap t UCL	4873
95% H-UCL (Log ROS)	8090		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	6.183	KM Geo Mean	484.4
KM SD (logged)	1.571	95% Critical H Value (KM-Log)	3.075
KM Standard Error of Mean (logged)	0.289	95% H-UCL (KM -Log)	3473
KM SD (logged)	1.571	95% Critical H Value (KM-Log)	3.075
KM Standard Error of Mean (logged)	0.289		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2242	Mean in Log Scale	6.186
SD in Original Scale	5179	SD in Log Scale	1.56
95% t UCL (Assumes normality)	3555	95% H-Stat UCL	3399

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

nma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	4496

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(k)fluoranthene)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	22
Number of Detects	11	Number of Non-Detects	33
Number of Distinct Detects	10	Number of Distinct Non-Detects	12
Minimum Detect	150	Minimum Non-Detect	110
Maximum Detect	27000	Maximum Non-Detect	480
Variance Detects	66097309	Percent Non-Detects	75%
Mean Detects	6671	SD Detects	8130
Median Detects	4900	CV Detects	1.219
Skewness Detects	1.754	Kurtosis Detects	3.414
Mean of Logged Detects	7.725	SD of Logged Detects	1.896

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.803	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.211	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1790	KM Standard Error of Mean	758
KM SD	4792	95% KM (BCA) UCL	3184
95% KM (t) UCL	3064	95% KM (Percentile Bootstrap) UCL	3096
95% KM (z) UCL	3037	95% KM Bootstrap t UCL	4342
90% KM Chebyshev UCL	4064	95% KM Chebyshev UCL	5094
97.5% KM Chebyshev UCL	6524	99% KM Chebyshev UCL	9332

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.339	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.775	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.158	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.268	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.575	k star (bias corrected MLE)	0.479
Theta hat (MLE)	11593	Theta star (bias corrected MLE)	13924
nu hat (MLE)	12.66	nu star (bias corrected)	10.54
Mean (detects)	6671		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1692
Maximum	27000	Median	0.01
SD	4882	CV	2.885
k hat (MLE)	0.0986	k star (bias corrected MLE)	0.107
Theta hat (MLE)	17155	Theta star (bias corrected MLE)	15805
nu hat (MLE)	8.681	nu star (bias corrected)	9.422
Adjusted Level of Significance (β)	0.0445		
Approximate Chi Square Value (9.42, α)	3.584	Adjusted Chi Square Value (9.42, β)	3.462
95% Gamma Approximate UCL (use when n>=50)	4449	95% Gamma Adjusted UCL (use when n<50)	4605

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1790	SD (KM)	4792
Variance (KM)	22964479	SE of Mean (KM)	758
k hat (KM)	0.14	k star (KM)	0.145
nu hat (KM)	12.28	nu star (KM)	12.78
theta hat (KM)	12828	theta star (KM)	12330
80% gamma percentile (KM)	1896	90% gamma percentile (KM)	5283
95% gamma percentile (KM)	9914	99% gamma percentile (KM)	23445

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.78, α)	5.743	Adjusted Chi Square Value (12.78, β)	5.583
95% Gamma Approximate KM-UCL (use when n>=50)	3983	95% Gamma Adjusted KM-UCL (use when n<50)	4097

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.89	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.204	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1795	Mean in Log Scale	5.26
SD in Original Scale	4849	SD in Log Scale	2.048
95% t UCL (assumes normality of ROS data)	3024	95% Percentile Bootstrap UCL	3010
95% BCA Bootstrap UCL	3690	95% Bootstrap t UCL	4294
95% H-UCL (Log ROS)	5045		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.719	KM Geo Mean	304.5
KM SD (logged)	1.492	95% Critical H Value (KM-Log)	2.969
KM Standard Error of Mean (logged)	0.264	95% H-UCL (KM -Log)	1820
KM SD (logged)	1.492	95% Critical H Value (KM-Log)	2.969
KM Standard Error of Mean (logged)	0.264		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1804	Mean in Log Scale	5.819
SD in Original Scale	4843	SD in Log Scale	1.454
95% t UCL (Assumes normality)	3031	95% H-Stat UCL	1851

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	3064

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (chromium)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	24
		Number of Missing Observations	0
Minimum	910	Mean	4095
Maximum	8600	Median	3640
SD	1945	Std. Error of Mean	381.4
Coefficient of Variation	0.475	Skewness	0.617

Normal GOF Test

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.92	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.123	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.17	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	4746	95% Adjusted-CLT UCL (Chen-1995)	4772
		95% Modified-t UCL (Johnson-1978)	4754

Gamma GOF Test

A-D Test Statistic	0.112	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0714	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.172	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.353	k star (bias corrected MLE)	3.877
Theta hat (MLE)	940.7	Theta star (bias corrected MLE)	1056
nu hat (MLE)	226.4	nu star (bias corrected)	201.6
MLE Mean (bias corrected)	4095	MLE Sd (bias corrected)	2080
		Approximate Chi Square Value (0.05)	169.7
Adjusted Level of Significance	0.0398	Adjusted Chi Square Value	167.8

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	4863	95% Adjusted Gamma UCL (use when n<50)	4919

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.92	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0874	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.17	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.813	Mean of logged Data	8.198
Maximum of Logged Data	9.06	SD of logged Data	0.522

Assuming Lognormal Distribution

95% H-UCL	5126	90% Chebyshev (MVUE) UCL	5472
95% Chebyshev (MVUE) UCL	6075	97.5% Chebyshev (MVUE) UCL	6911
99% Chebyshev (MVUE) UCL	8554		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	4722	95% Jackknife UCL	4746
95% Standard Bootstrap UCL	4721	95% Bootstrap-t UCL	4784
95% Hall's Bootstrap UCL	4815	95% Percentile Bootstrap UCL	4718
95% BCA Bootstrap UCL	4735		
90% Chebyshev(Mean, Sd) UCL	5239	95% Chebyshev(Mean, Sd) UCL	5757
97.5% Chebyshev(Mean, Sd) UCL	6477	99% Chebyshev(Mean, Sd) UCL	7890

Suggested UCL to Use

95% Student's-t UCL 4746

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

PIKA ARCADIS a joint venture

Result (dibenz(a,h)anthracene)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	22
Number of Detects	7	Number of Non-Detects	37
Number of Distinct Detects	7	Number of Distinct Non-Detects	16
Minimum Detect	91	Minimum Non-Detect	160
Maximum Detect	3900	Maximum Non-Detect	3500
Variance Detects	2475848	Percent Non-Detects	84.09%
Mean Detects	1389	SD Detects	1573
Median Detects	470	CV Detects	1.133
Skewness Detects	0.864	Kurtosis Detects	-1.121
Mean of Logged Detects	6.406	SD of Logged Detects	1.526

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.82	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.292	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	328.6	KM Standard Error of Mean	123.7
KM SD	747.1	95% KM (BCA) UCL	564.5
95% KM (t) UCL	536.5	95% KM (Percentile Bootstrap) UCL	554
95% KM (z) UCL	532.1	95% KM Bootstrap t UCL	741.3
90% KM Chebyshev UCL	699.7	95% KM Chebyshev UCL	867.7
97.5% KM Chebyshev UCL	1101	99% KM Chebyshev UCL	1559

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.449	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.225	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.323	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.724	k star (bias corrected MLE)	0.509
Theta hat (MLE)	1917	Theta star (bias corrected MLE)	2727
nu hat (MLE)	10.14	nu star (bias corrected)	7.128
Mean (detects)	1389		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	268.8
Maximum	3900	Median	0.01
SD	779.8	CV	2.901
k hat (MLE)	0.116	k star (bias corrected MLE)	0.123
Theta hat (MLE)	2318	Theta star (bias corrected MLE)	2181
nu hat (MLE)	10.21	nu star (bias corrected)	10.85
Adjusted Level of Significance (β)	0.0445		
Approximate Chi Square Value (10.85, α)	4.477	Adjusted Chi Square Value (10.85, β)	4.338
95% Gamma Approximate UCL (use when n>=50)	651.3	95% Gamma Adjusted UCL (use when n<50)	672.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	328.6	SD (KM)	747.1
Variance (KM)	558203	SE of Mean (KM)	123.7
k hat (KM)	0.193	k star (KM)	0.195
nu hat (KM)	17.02	nu star (KM)	17.2
theta hat (KM)	1699	theta star (KM)	1682
80% gamma percentile (KM)	427.7	90% gamma percentile (KM)	993.6
95% gamma percentile (KM)	1703	99% gamma percentile (KM)	3665

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.20, α)	8.813	Adjusted Chi Square Value (17.20, β)	8.608
95% Gamma Approximate KM-UCL (use when n>=50)	641.2	95% Gamma Adjusted KM-UCL (use when n<50)	656.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.195	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	329.9	Mean in Log Scale	4.893
SD in Original Scale	755.4	SD in Log Scale	1.109
95% t UCL (assumes normality of ROS data)	521.3	95% Percentile Bootstrap UCL	530.8
95% BCA Bootstrap UCL	643.7	95% Bootstrap t UCL	822.5
95% H-UCL (Log ROS)	375.9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.036	KM Geo Mean	153.9
KM SD (logged)	0.878	95% Critical H Value (KM-Log)	2.236
KM Standard Error of Mean (logged)	0.202	95% H-UCL (KM -Log)	305.1
KM SD (logged)	0.878	95% Critical H Value (KM-Log)	2.236
KM Standard Error of Mean (logged)	0.202		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	409	Mean in Log Scale	5.408
SD in Original Scale	767.8	SD in Log Scale	0.844
95% t UCL (Assumes normality)	603.6	95% H-Stat UCL	423.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	536.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

PIKA ARCADIS a joint venture

Result (indeno(1,2,3-cd)pyrene)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	26
Number of Detects	14	Number of Non-Detects	30
Number of Distinct Detects	13	Number of Distinct Non-Detects	14
Minimum Detect	92	Minimum Non-Detect	170
Maximum Detect	16000	Maximum Non-Detect	870
Variance Detects	23014745	Percent Non-Detects	68.18%
Mean Detects	3554	SD Detects	4797
Median Detects	695	CV Detects	1.35
Skewness Detects	1.715	Kurtosis Detects	2.605
Mean of Logged Detects	7.117	SD of Logged Detects	1.651

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.747	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.289	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1214	KM Standard Error of Mean	478.8
KM SD	3059	95% KM (BCA) UCL	2160
95% KM (t) UCL	2018	95% KM (Percentile Bootstrap) UCL	2045
95% KM (z) UCL	2001	95% KM Bootstrap t UCL	2822
90% KM Chebyshev UCL	2650	95% KM Chebyshev UCL	3301
97.5% KM Chebyshev UCL	4204	99% KM Chebyshev UCL	5978

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.648	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.786	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.247	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.24	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.586	k star (bias corrected MLE)	0.508
Theta hat (MLE)	6070	Theta star (bias corrected MLE)	7001
nu hat (MLE)	16.4	nu star (bias corrected)	14.22
Mean (detects)	3554		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1131
Maximum	16000	Median	0.01
SD	3125	CV	2.763
k hat (MLE)	0.102	k star (bias corrected MLE)	0.111
Theta hat (MLE)	11043	Theta star (bias corrected MLE)	10228
nu hat (MLE)	9.012	nu star (bias corrected)	9.731
Adjusted Level of Significance (β)	0.0445		
Approximate Chi Square Value (9.73, α)	3.774	Adjusted Chi Square Value (9.73, β)	3.649
95% Gamma Approximate UCL (use when n>=50)	2916	95% Gamma Adjusted UCL (use when n<50)	3016

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1214	SD (KM)	3059
Variance (KM)	9359290	SE of Mean (KM)	478.8
k hat (KM)	0.157	k star (KM)	0.162
nu hat (KM)	13.85	nu star (KM)	14.24
theta hat (KM)	7712	theta star (KM)	7502
80% gamma percentile (KM)	1401	90% gamma percentile (KM)	3631
95% gamma percentile (KM)	6577	99% gamma percentile (KM)	14998

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.24, α)	6.733	Adjusted Chi Square Value (14.24, β)	6.558
95% Gamma Approximate KM-UCL (use when n>=50)	2566	95% Gamma Adjusted KM-UCL (use when n<50)	2634

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1185	Mean in Log Scale	4.977
SD in Original Scale	3105	SD in Log Scale	1.905
95% t UCL (assumes normality of ROS data)	1972	95% Percentile Bootstrap UCL	1978
95% BCA Bootstrap UCL	2278	95% Bootstrap t UCL	2682
95% H-UCL (Log ROS)	2487		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.484	KM Geo Mean	240.9
KM SD (logged)	1.461	95% Critical H Value (KM-Log)	2.93
KM Standard Error of Mean (logged)	0.247	95% H-UCL (KM -Log)	1346
KM SD (logged)	1.461	95% Critical H Value (KM-Log)	2.93
KM Standard Error of Mean (logged)	0.247		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1255	Mean in Log Scale	5.779
SD in Original Scale	3080	SD in Log Scale	1.323
95% t UCL (Assumes normality)	2035	95% H-Stat UCL	1350

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

nma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	2634

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Constituent	Original Data	Result	D_Result	Location ID
2-Methylnaphthalene	11000	11000	1	EW-E6-a
2-Methylnaphthalene	31000	31000	1	EW-E7-a
2-Methylnaphthalene	11000	11000	1	EW-I4-a
2-Methylnaphthalene	50000	50000	1	EW-L8-B
2-Methylnaphthalene	< 370 U	370	0	FTASB-04
2-Methylnaphthalene	< 340 U	340	0	FTASB-06
2-Methylnaphthalene	< 420 U	420	0	FTASB-09
2-Methylnaphthalene	< 360 U	360	0	FTASB-13
2-Methylnaphthalene	< 430 U	430	0	FTASB-13
2-Methylnaphthalene	< 370 U	370	0	FTASB-14
2-Methylnaphthalene	< 360 U	360	0	FTASB-15
2-Methylnaphthalene	< 350 U	350	0	FTASB-16
2-Methylnaphthalene	< 350 U	350	0	FTASB-17
2-Methylnaphthalene	< 370 U	370	0	HMW-10
2-Methylnaphthalene	< 410 U	410	0	HMW-10
2-Methylnaphthalene	< 400 U	400	0	HMW-11
2-Methylnaphthalene	< 400 U	400	0	HMW-12
2-Methylnaphthalene	32000	32000	1	HMW-13
Acenaphthylene	< 370 U	370	0	FTASB-04
Acenaphthylene	< 340 U	340	0	FTASB-06
Acenaphthylene	< 420 U	420	0	FTASB-09
Acenaphthylene	< 360 U	360	0	FTASB-13
Acenaphthylene	< 430 U	430	0	FTASB-13
Acenaphthylene	150	150	1	FTASB-14
Acenaphthylene	260	260	1	FTASB-15
Acenaphthylene	< 350 U	350	0	FTASB-16
Acenaphthylene	240	240	1	FTASB-17
Acenaphthylene	< 370 U	370	0	HMW-10
Acenaphthylene	< 410 U	410	0	HMW-10
Acenaphthylene	710	710	1	HMW-11
Acenaphthylene	110	110	1	HMW-12
Acenaphthylene	< 400 U	400	0	HMW-13
Acenaphthylene	< 360 U	360	0	HMW-14
Acenaphthylene	< 340 U	340	0	HMW-14R
Acenaphthylene	< 380 U	380	0	HMW-15
Acenaphthylene	3600	3600	1	HMW-16A
Acenaphthylene	< 360 U	360	0	HMW-17
Acenaphthylene	< 420 U	420	0	HMW-18
Acenaphthylene	< 380 U	380	0	HMW-18
Acenaphthylene	< 110 U	110	0	HSB-4
Acenaphthylene	< 170 U	170	0	PSB-1
Acenaphthylene	< 1800 U	1800	0	PSB-1
Acenaphthylene	< 170 U	170	0	PSB-2
Acenaphthylene	< 81 U	81	0	PSB-2
Acenaphthylene	< 180 U	180	0	PSB-2
Acenaphthylene	< 83 U	83	0	PSB-2
Acenaphthylene	< 810 U	810	0	PSB-3
Acenaphthylene	< 170 U	170	0	PSB-3
Acenaphthylene	< 74 U	74	0	PSB-5
Acenaphthylene	< 82 U	82	0	PSB-5
Acenaphthylene	< 340 U	340	0	SB-018
Acenaphthylene	< 370 U	370	0	SB-019
Acenaphthylene	< 360 U	360	0	SB-020
Acenaphthylene	< 340 U	340	0	SB-021
Acenaphthylene	< 400 U	400	0	SB-022
Acenaphthylene	< 360 U	360	0	SB-023
Acenaphthylene	< 480 U	480	0	SB-024
Acenaphthylene	1600	1600	1	SB-025
Acenaphthylene	830	830	1	SB-026
Acenaphthylene	2400	2400	1	SB-027
Acenaphthylene	< 370 U	370	0	SB-028
Acenaphthylene	< 360 U	360	0	SB-029
Acenaphthylene	< 350 U	350	0	SB-030
Acenaphthylene	< 360 U	360	0	SB-035
Acenaphthylene	970	970	1	SB-036
Acenaphthylene	< 390 U	390	0	SB-036
Acenaphthylene	< 370 U	370	0	SB-037
Acenaphthylene	< 400 U	400	0	SB-037
Acenaphthylene	1100	1100	1	SB-038
Acenaphthylene	< 430 U	430	0	SB-038
Acenaphthylene	< 430 U	430	0	SB-041
Acenaphthylene	< 350 U	350	0	SB-041
Acenaphthylene	< 440 U	440	0	SB-042
Acenaphthylene	< 350 U	350	0	SB-043
Acenaphthylene	< 350 U	350	0	SB-043
Acenaphthylene	< 350 U	350	0	SB-044
Acenaphthylene	< 340 U	340	0	SB-045
Acenaphthylene	< 330 U	330	0	SB-049
Acenaphthylene	< 340 U	340	0	SB-050
Acetone	< 22 U	22	0	FTASB-04
Acetone	< 21 U	21	0	FTASB-06
Acetone	< 25 U	25	0	FTASB-09
Acetone	< 22 U	22	0	FTASB-13
Acetone	< 26 U	26	0	FTASB-13
Acetone	140	140	1	FTASB-14
Acetone	< 22 U	22	0	FTASB-15
Acetone	52	52	1	FTASB-16
Acetone	88	88	1	FTASB-17
Acetone	< 22 U	22	0	HA01-MW-09
Acetone	< 35 U	35	0	HA01-MW-10
Acetone	< 27 U	27	0	HA01-MW-10

Constituent	Original Data	Result	D_Result	Location ID
Acetone	< 27 U	27	0	HA01-MW-11
Acetone	< 23 U	23	0	HA01-MW-11
Acetone	24 UB	24	0	HA01-MW-12
Acetone	< 28 U	28	0	HA01-MW-13
Acetone	< 25 U	25	0	HA01-MW-14
Acetone	< 24 U	24	0	HA01-MW-14
Acetone	< 25 U	25	0	HA01-MW-15
Acetone	< 22 U	22	0	HA01-MW-16
Acetone	< 25 UJ	25	0	HA01-MW-17
Acetone	< 23 U	23	0	HMW-10
Acetone	2800	2800	1	HMW-10
Acetone	24000	24000	1	HMW-11
Acetone	< 24 U	24	0	HMW-12
Acetone	< 6000 U	6000	0	HMW-13
Acetone	< 57 U	57	0	HMW-14
Acetone	< 52 U	52	0	HMW-14R
Acetone	75	75	1	HMW-15
Acetone	170	170	1	HMW-16A
Acetone	< 60 U	60	0	HMW-17
Acetone	< 54 U	54	0	HMW-18
Acetone	< 64 U	64	0	HMW-18
Acetone	< 20 U	20	0	HSB-4
Acetone	< 5.6 U	5.6	0	SB-018
Acetone	< 64 U	64	0	SB-019
Acetone	< 62 U	62	0	SB-020
Acetone	< 64 U	64	0	SB-021
Acetone	< 66 U	66	0	SB-022
Acetone	< 64 U	64	0	SB-023
Acetone	160	160	1	SB-024
Acetone	< 56 U	56	0	SB-025
Acetone	79	79	1	SB-026
Acetone	< 65 U	65	0	SB-027
Acetone	< 67 U	67	0	SB-028
Acetone	< 64 U	64	0	SB-029
Acetone	< 53 U	53	0	SB-030
Acetone	< 53 U	53	0	SB-031
Acetone	< 53 U	53	0	SB-033
Acetone	< 53 U	53	0	SB-033
Acetone	< 54 U	54	0	SB-034
Acetone	< 56 U	56	0	SB-034
Acetone	< 55 U	55	0	SB-035
Acetone	< 55 U	55	0	SB-036
Acetone	< 60 U	60	0	SB-036
Acetone	< 56 U	56	0	SB-037
Acetone	< 61 U	61	0	SB-037
Acetone	< 57 U	57	0	SB-038
Acetone	< 66 UJ	66	0	SB-038
Acetone	< 59 U	59	0	SB-039
Acetone	< 300 U	300	0	SB-039
Acetone	< 57 U	57	0	SB-040
Acetone	< 63 U	63	0	SB-040
Acetone	< 60 U	60	0	SB-041
Acetone	88 JB	88	1	SB-043
Acetone	< 60 U	60	0	SB-043
Acetone	< 60 U	60	0	SB-043A
Acetone	< 58 U	58	0	SB-044
Anthracene	< 370 U	370	0	FTASB-04
Anthracene	140	140	1	FTASB-06
Anthracene	< 420 U	420	0	FTASB-09
Anthracene	< 360 U	360	0	FTASB-13
Anthracene	< 430 U	430	0	FTASB-13
Anthracene	130	130	1	FTASB-14
Anthracene	150	150	1	FTASB-15
Anthracene	< 350 U	350	0	FTASB-16
Anthracene	150	150	1	FTASB-17
Anthracene	42	42	1	HMW-10
Anthracene	< 410 U	410	0	HMW-10
Anthracene	1900	1900	1	HMW-11
Anthracene	110	110	1	HMW-12
Anthracene	< 400 U	400	0	HMW-13
Anthracene	< 360 U	360	0	HMW-14
Anthracene	< 340 U	340	0	HMW-14R
Anthracene	< 380 U	380	0	HMW-15
Anthracene	7500	7500	1	HMW-16A
Anthracene	< 360 U	360	0	HMW-17
Anthracene	< 420 U	420	0	HMW-18
Anthracene	< 380 U	380	0	HMW-18
Anthracene	< 83 U	83	0	HSB-4
Anthracene	< 78 U	78	0	PSB-1
Anthracene	< 85000 U	85000	0	PSB-1
Anthracene	< 81 U	81	0	PSB-2
Anthracene	< 81 U	81	0	PSB-2
Anthracene	< 84 U	84	0	PSB-2
Anthracene	< 83 U	83	0	PSB-2
Anthracene	670	670	1	PSB-3
Anthracene	< 80 U	80	0	PSB-3
Anthracene	< 74 U	74	0	PSB-5
Anthracene	< 82 U	82	0	PSB-5
Anthracene	< 340 U	340	0	SB-018
Anthracene	< 370 U	370	0	SB-019
Anthracene	< 360 U	360	0	SB-020

Constituent	Original Data	Result	D_Result	Location ID
Anthracene	< 340 U	340	0	SB-021
Anthracene	< 400 U	400	0	SB-022
Anthracene	< 360 U	360	0	SB-023
Anthracene	< 480 U	480	0	SB-024
Anthracene	1500	1500	1	SB-025
Anthracene	2200	2200	1	SB-026
Anthracene	2800	2800	1	SB-027
Anthracene	< 370 U	370	0	SB-028
Anthracene	< 360 U	360	0	SB-029
Anthracene	< 350 U	350	0	SB-030
Anthracene	< 360 U	360	0	SB-035
Anthracene	870	870	1	SB-036
Anthracene	< 390 U	390	0	SB-036
Anthracene	< 370 U	370	0	SB-037
Anthracene	< 400 U	400	0	SB-037
Anthracene	7400	7400	1	SB-038
Anthracene	< 430 U	430	0	SB-038
Anthracene	< 430 U	430	0	SB-041
Anthracene	< 350 U	350	0	SB-041
Anthracene	< 440 U	440	0	SB-042
Anthracene	< 350 U	350	0	SB-043
Anthracene	< 350 U	350	0	SB-043
Anthracene	< 350 U	350	0	SB-044
Anthracene	< 340 U	340	0	SB-045
Anthracene	< 330 U	330	0	SB-049
Anthracene	< 340 U	340	0	SB-050
Arsenic	820	820	1	FTASB-04
Arsenic	560	560	1	FTASB-06
Arsenic	660	660	1	FTASB-09
Arsenic	1560	1560	1	FTASB-13
Arsenic	1620 JQ	1620	1	FTASB-13
Arsenic	1280	1280	1	FTASB-14
Arsenic	1950	1950	1	FTASB-15
Arsenic	1430	1430	1	FTASB-16
Arsenic	2140	2140	1	FTASB-17
Arsenic	670	670	1	HA01-MW-09
Arsenic	1000	1000	1	HA01-MW-10
Arsenic	470 J	470	1	HA01-MW-10
Arsenic	300 J	300	1	HA01-MW-11
Arsenic	460 J	460	1	HA01-MW-11
Arsenic	470 J	470	1	HA01-MW-12
Arsenic	250 J	250	1	HA01-MW-13
Arsenic	1700	1700	1	HA01-MW-14
Arsenic	470 J	470	1	HA01-MW-14
Arsenic	1400	1400	1	HA01-MW-15
Arsenic	570	570	1	HA01-MW-16
Arsenic	730	730	1	HA01-MW-17
Arsenic	1640	1640	1	HMW-10
Arsenic	260 JQ	260	1	HMW-10
Arsenic	840 JQ	840	1	HMW-11
Arsenic	510 JQ	510	1	HMW-12
Arsenic	720 JQ	720	1	HMW-13
Arsenic	650	650	1	HSB-4
Arsenic	1020	1020	1	PSB-1
Arsenic	630	630	1	PSB-1
Arsenic	1280	1280	1	PSB-2
Arsenic	1320	1320	1	PSB-2
Arsenic	2440	2440	1	PSB-2
Arsenic	1310	1310	1	PSB-2
Arsenic	510	510	1	PSB-3
Arsenic	330	330	1	PSB-3
Arsenic	610	610	1	PSB-5
Arsenic	560	560	1	PSB-5
Barium	12000	12000	1	EW-E6-a
Barium	12000	12000	1	EW-E6-b
Barium	15000	15000	1	EW-E7-a
Barium	11000	11000	1	EW-E8-a
Barium	13000	13000	1	EW-E8-b
Barium	10000	10000	1	EW-F5
Barium	9500	9500	1	EW-G5-a
Barium	10000	10000	1	EW-G5-b
Barium	7800	7800	1	EW-H4
Barium	7100	7100	1	EW-I4-a
Barium	9200	9200	1	EW-I4-b
Barium	9400	9400	1	EW-J4
Barium	8100 [15000]	15000	1	EW-K4 [DUP]
Barium	8900	8900	1	EW-L4
Barium	12000	12000	1	EW-L5-a
Barium	11000	11000	1	EW-L5-b
Barium	10000 [13000]	13000	1	EW-L6 [DUP]
Barium	9400	9400	1	EW-L7
Barium	14000	14000	1	EW-L8-a
Barium	12000	12000	1	EW-L8-B
Barium	11000	11000	1	FTASB-04
Barium	7450	7450	1	FTASB-06
Barium	11000	11000	1	FTASB-09
Barium	12000	12000	1	FTASB-13
Barium	33000	33000	1	FTASB-13
Barium	12000	12000	1	FTASB-14
Barium	18000	18000	1	FTASB-15
Barium	11000	11000	1	FTASB-16

Constituent	Original Data	Result	D_Result	Location ID
Barium	18000	18000	1	FTASB-17
Barium	23000	23000	1	HA01-MW-09
Barium	10000	10000	1	HA01-MW-10
Barium	8700	8700	1	HA01-MW-10
Barium	8200	8200	1	HA01-MW-11
Barium	13000	13000	1	HA01-MW-11
Barium	4300	4300	1	HA01-MW-12
Barium	2400	2400	1	HA01-MW-13
Barium	25000	25000	1	HA01-MW-14
Barium	3100	3100	1	HA01-MW-14
Barium	13000	13000	1	HA01-MW-15
Barium	3600	3600	1	HA01-MW-16
Barium	3600	3600	1	HA01-MW-17
Barium	16000	16000	1	HMW-10
Barium	6250 JQ	6250	1	HMW-10
Barium	11700 J	11700	1	HMW-11
Barium	5960 JQ	5960	1	HMW-12
Barium	7850 JQ	7850	1	HMW-13
Barium	4440	4440	1	HSB-4
Barium	11400	11400	1	PSB-1
Barium	12800	12800	1	PSB-1
Barium	14900	14900	1	PSB-2
Barium	19100	19100	1	PSB-2
Barium	23400	23400	1	PSB-2
Barium	23600	23600	1	PSB-2
Barium	18300	18300	1	PSB-3
Barium	13900	13900	1	PSB-3
Barium	16200	16200	1	PSB-5
Barium	19100	19100	1	PSB-5
Barium	6500	6500	1	SB-047
Benz(a)anthracene	< 370 U	370	0	FTASB-04
Benz(a)anthracene	170	170	1	FTASB-06
Benz(a)anthracene	< 420 U	420	0	FTASB-09
Benz(a)anthracene	160	160	1	FTASB-13
Benz(a)anthracene	99	99	1	FTASB-13
Benz(a)anthracene	930	930	1	FTASB-14
Benz(a)anthracene	730	730	1	FTASB-15
Benz(a)anthracene	< 350 U	350	0	FTASB-16
Benz(a)anthracene	630	630	1	FTASB-17
Benz(a)anthracene	340	340	1	HMW-10
Benz(a)anthracene	< 410 U	410	0	HMW-10
Benz(a)anthracene	8000	8000	1	HMW-11
Benz(a)anthracene	840	840	1	HMW-12
Benz(a)anthracene	61	61	1	HMW-13
Benz(a)anthracene	< 360 U	360	0	HMW-14
Benz(a)anthracene	< 340 U	340	0	HMW-14R
Benz(a)anthracene	< 380 U	380	0	HMW-15
Benz(a)anthracene	34000	34000	1	HMW-16A
Benz(a)anthracene	< 360 U	360	0	HMW-17
Benz(a)anthracene	< 420 U	420	0	HMW-18
Benz(a)anthracene	< 380 U	380	0	HMW-18
Benz(a)anthracene	< 68 U	68	0	HSB-4
Benz(a)anthracene	370	370	1	PSB-1
Benz(a)anthracene	< 1200 U	1200	0	PSB-1
Benz(a)anthracene	170	170	1	PSB-2
Benz(a)anthracene	140	140	1	PSB-2
Benz(a)anthracene	< 120 U	120	0	PSB-2
Benz(a)anthracene	< 120 U	120	0	PSB-2
Benz(a)anthracene	5300	5300	1	PSB-3
Benz(a)anthracene	< 110 U	110	0	PSB-3
Benz(a)anthracene	< 110 U	110	0	PSB-5
Benz(a)anthracene	< 120 U	120	0	PSB-5
Benz(a)anthracene	< 340 U	340	0	SB-018
Benz(a)anthracene	< 370 U	370	0	SB-019
Benz(a)anthracene	< 360 U	360	0	SB-020
Benz(a)anthracene	< 340 U	340	0	SB-021
Benz(a)anthracene	< 400 U	400	0	SB-022
Benz(a)anthracene	510	510	1	SB-023
Benz(a)anthracene	< 480 U	480	0	SB-024
Benz(a)anthracene	7400	7400	1	SB-025
Benz(a)anthracene	6800	6800	1	SB-026
Benz(a)anthracene	17000	17000	1	SB-027
Benz(a)anthracene	< 370 U	370	0	SB-028
Benz(a)anthracene	< 360 U	360	0	SB-029
Benz(a)anthracene	< 350 U	350	0	SB-030
Benz(a)anthracene	< 360 U	360	0	SB-035
Benz(a)anthracene	8700	8700	1	SB-036
Benz(a)anthracene	< 390 U	390	0	SB-036
Benz(a)anthracene	< 370 U	370	0	SB-037
Benz(a)anthracene	< 400 U	400	0	SB-037
Benz(a)anthracene	15000	15000	1	SB-038
Benz(a)anthracene	< 430 U	430	0	SB-038
Benz(a)anthracene	< 430 U	430	0	SB-041
Benz(a)anthracene	< 350 U	350	0	SB-041
Benz(a)anthracene	< 440 U	440	0	SB-042
Benz(a)anthracene	< 350 U	350	0	SB-043
Benz(a)anthracene	< 350 U	350	0	SB-043
Benz(a)anthracene	< 350 U	350	0	SB-044
Benz(a)anthracene	< 340 U	340	0	SB-045
Benz(a)anthracene	< 330 U	330	0	SB-049
Benz(a)anthracene	< 340 U	340	0	SB-050

Constituent	Original Data	Result	D_Result	Location ID
Benzene	130 J	130	1	EW-E6-a
Benzene	22	22	1	EW-E6-b
Benzene	1200	1200	1	EW-E7-a
Benzene	13 J	13	1	EW-E8-a
Benzene	< 5 U	5	0	EW-E8-b
Benzene	13 J	13	1	EW-F5
Benzene	2.8 J	2.8	1	EW-G5-a
Benzene	7.8	7.8	1	EW-G5-b
Benzene	< 10 U	10	0	EW-H4
Benzene	< 1000 U	1000	0	EW-I4-a
Benzene	< 5 U	5	0	EW-I4-b
Benzene	< 5 U	5	0	EW-J4
Benzene	< 25 U [< 25 U]	25	0	EW-K4 [DUP]
Benzene	100 J	100	1	EW-L4
Benzene	450	450	1	EW-L5-a
Benzene	60 J	60	1	EW-L5-b
Benzene	< 5 U [< 5 U]	5	0	EW-L6 [DUP]
Benzene	5.9	5.9	1	EW-L7
Benzene	< 5 U	5	0	EW-L8-a
Benzene	2900	2900	1	EW-L8-B
Benzene	< 6 U	6	0	FTASB-04
Benzene	< 5 U	5	0	FTASB-06
Benzene	< 6 U	6	0	FTASB-09
Benzene	< 6 U	6	0	FTASB-13
Benzene	< 7 U	7	0	FTASB-13
Benzene	< 6 U	6	0	FTASB-14
Benzene	< 5 U	5	0	FTASB-15
Benzene	< 5 U	5	0	FTASB-16
Benzene	< 5 U	5	0	FTASB-17
Benzene	< 5.5 U	5.5	0	HA01-MW-09
Benzene	< 8.8 U	8.8	0	HA01-MW-10
Benzene	< 6.8 U	6.8	0	HA01-MW-10
Benzene	< 6.7 U	6.7	0	HA01-MW-11
Benzene	< 5.8 U	5.8	0	HA01-MW-11
Benzene	< 6.9 U	6.9	0	HA01-MW-12
Benzene	< 6.9 U	6.9	0	HA01-MW-13
Benzene	< 6.2 U	6.2	0	HA01-MW-14
Benzene	< 5.9 U	5.9	0	HA01-MW-14
Benzene	< 6.3 U	6.3	0	HA01-MW-15
Benzene	< 5.4 U	5.4	0	HA01-MW-16
Benzene	< 6.1 U	6.1	0	HA01-MW-17
Benzene	< 6 U	6	0	HMW-10
Benzene	< 6 U	6	0	HMW-10
Benzene	< 6 U	6	0	HMW-11
Benzene	< 6 U	6	0	HMW-12
Benzene	1900	1900	1	HMW-13
Benzene	< 1.3 U	1.3	0	HSB-4
Benzene	< 5.6 U	5.6	0	PSB-1
Benzene	< 30 U	30	0	PSB-1
Benzene	< 5.8 U	5.8	0	PSB-2
Benzene	< 5.8 U	5.8	0	PSB-2
Benzene	< 6 U	6	0	PSB-2
Benzene	< 6 U	6	0	PSB-2
Benzene	< 5.4 U	5.4	0	PSB-3
Benzene	< 5.7 U	5.7	0	PSB-3
Benzene	< 5.3 U	5.3	0	PSB-5
Benzene	< 5.8 U	5.8	0	PSB-5
Benzo(a)pyrene	< 370 U	370	0	FTASB-04
Benzo(a)pyrene	240	240	1	FTASB-06
Benzo(a)pyrene	< 420	420	0	FTASB-09
Benzo(a)pyrene	160	160	1	FTASB-13
Benzo(a)pyrene	< 430 U	430	0	FTASB-13
Benzo(a)pyrene	1200	1200	1	FTASB-14
Benzo(a)pyrene	790	790	1	FTASB-15
Benzo(a)pyrene	< 350 U	350	0	FTASB-16
Benzo(a)pyrene	760	760	1	FTASB-17
Benzo(a)pyrene	300	300	1	HMW-10
Benzo(a)pyrene	< 410 U	410	0	HMW-10
Benzo(a)pyrene	5700	5700	1	HMW-11
Benzo(a)pyrene	910	910	1	HMW-12
Benzo(a)pyrene	< 400 U	400	0	HMW-13
Benzo(a)pyrene	< 360 U	360	0	HMW-14
Benzo(a)pyrene	< 340 U	340	0	HMW-14R
Benzo(a)pyrene	< 380 U	380	0	HMW-15
Benzo(a)pyrene	26000	26000	1	HMW-16A
Benzo(a)pyrene	< 360 U	360	0	HMW-17
Benzo(a)pyrene	< 420 U	420	0	HMW-18
Benzo(a)pyrene	< 380 U	380	0	HMW-18
Benzo(a)pyrene	< 200 U	200	0	HSB-4
Benzo(a)pyrene	320	320	1	PSB-1
Benzo(a)pyrene	< 1700 U	1700	0	PSB-1
Benzo(a)pyrene	220	220	1	PSB-2
Benzo(a)pyrene	180	180	1	PSB-2
Benzo(a)pyrene	< 170 U	170	0	PSB-2
Benzo(a)pyrene	< 170 U	170	0	PSB-2
Benzo(a)pyrene	4800	4800	1	PSB-3
Benzo(a)pyrene	< 160 U	160	0	PSB-3
Benzo(a)pyrene	< 150 U	150	0	PSB-5
Benzo(a)pyrene	< 160 U	160	0	PSB-5
Benzo(a)pyrene	< 340 U	340	0	SB-018
Benzo(a)pyrene	< 370 U	370	0	SB-019

Constituent	Original Data	Result	D_Result	Location ID
Benzo(a)pyrene	< 360 U	360	0	SB-020
Benzo(a)pyrene	< 340 U	340	0	SB-021
Benzo(a)pyrene	< 400 U	400	0	SB-022
Benzo(a)pyrene	750	750	1	SB-023
Benzo(a)pyrene	< 480 U	480	0	SB-024
Benzo(a)pyrene	6200	6200	1	SB-025
Benzo(a)pyrene	5200	5200	1	SB-026
Benzo(a)pyrene	16000	16000	1	SB-027
Benzo(a)pyrene	< 370 U	370	0	SB-028
Benzo(a)pyrene	< 360 U	360	0	SB-029
Benzo(a)pyrene	< 350 U	350	0	SB-030
Benzo(a)pyrene	< 360 U	360	0	SB-035
Benzo(a)pyrene	8900	8900	1	SB-036
Benzo(a)pyrene	< 390 U	390	0	SB-036
Benzo(a)pyrene	< 370 U	370	0	SB-037
Benzo(a)pyrene	< 400 U	400	0	SB-037
Benzo(a)pyrene	9900	9900	1	SB-038
Benzo(a)pyrene	< 430 U	430	0	SB-038
Benzo(a)pyrene	< 430 U	430	0	SB-041
Benzo(a)pyrene	< 350 U	350	0	SB-041
Benzo(a)pyrene	< 440 U	440	0	SB-042
Benzo(a)pyrene	< 350 U	350	0	SB-043
Benzo(a)pyrene	< 350 U	350	0	SB-043
Benzo(a)pyrene	< 350 U	350	0	SB-044
Benzo(a)pyrene	< 340 U	340	0	SB-045
Benzo(a)pyrene	< 330 U	330	0	SB-049
Benzo(a)pyrene	< 340 U	340	0	SB-050
Benzo(b)fluoranthene	< 370 U	370	0	FTASB-04
Benzo(b)fluoranthene	470	470	1	FTASB-06
Benzo(b)fluoranthene	< 420	420	0	FTASB-09
Benzo(b)fluoranthene	320	320	1	FTASB-13
Benzo(b)fluoranthene	< 430 U	430	0	FTASB-13
Benzo(b)fluoranthene	2600	2600	1	FTASB-14
Benzo(b)fluoranthene	2200	2200	1	FTASB-15
Benzo(b)fluoranthene	< 350 U	350	0	FTASB-16
Benzo(b)fluoranthene	2000	2000	1	FTASB-17
Benzo(b)fluoranthene	720	720	1	HMW-10
Benzo(b)fluoranthene	< 410 U	410	0	HMW-10
Benzo(b)fluoranthene	12000	12000	1	HMW-11
Benzo(b)fluoranthene	1800	1800	1	HMW-12
Benzo(b)fluoranthene	110	110	1	HMW-13
Benzo(b)fluoranthene	< 360 U	360	0	HMW-14
Benzo(b)fluoranthene	< 340 U	340	0	HMW-14R
Benzo(b)fluoranthene	< 380 U	380	0	HMW-15
Benzo(b)fluoranthene	28000	28000	1	HMW-16A
Benzo(b)fluoranthene	< 360 U	360	0	HMW-17
Benzo(b)fluoranthene	< 420 U	420	0	HMW-18
Benzo(b)fluoranthene	< 380 U	380	0	HMW-18
Benzo(b)fluoranthene	< 150 U	150	0	HSB-4
Benzo(b)fluoranthene	560	560	1	PSB-1
Benzo(b)fluoranthene	< 1200 U	1200	0	PSB-1
Benzo(b)fluoranthene	370	370	1	PSB-2
Benzo(b)fluoranthene	160	160	1	PSB-2
Benzo(b)fluoranthene	< 120 U	120	0	PSB-2
Benzo(b)fluoranthene	< 120 U	120	0	PSB-2
Benzo(b)fluoranthene	6900	6900	1	PSB-3
Benzo(b)fluoranthene	< 110 U	110	0	PSB-3
Benzo(b)fluoranthene	< 110 U	110	0	PSB-5
Benzo(b)fluoranthene	< 120 U	120	0	PSB-5
Benzo(b)fluoranthene	< 340 U	340	0	SB-018
Benzo(b)fluoranthene	< 370 U	370	0	SB-019
Benzo(b)fluoranthene	< 360 U	360	0	SB-020
Benzo(b)fluoranthene	< 340 U	340	0	SB-021
Benzo(b)fluoranthene	< 400 U	400	0	SB-022
Benzo(b)fluoranthene	740	740	1	SB-023
Benzo(b)fluoranthene	< 480 U	480	0	SB-024
Benzo(b)fluoranthene	7000	7000	1	SB-025
Benzo(b)fluoranthene	5800	5800	1	SB-026
Benzo(b)fluoranthene	17000	17000	1	SB-027
Benzo(b)fluoranthene	< 370 U	370	0	SB-028
Benzo(b)fluoranthene	< 360 U	360	0	SB-029
Benzo(b)fluoranthene	< 350 U	350	0	SB-030
Benzo(b)fluoranthene	< 360 U	360	0	SB-035
Benzo(b)fluoranthene	8700	8700	1	SB-036
Benzo(b)fluoranthene	< 390 U	390	0	SB-036
Benzo(b)fluoranthene	< 370 U	370	0	SB-037
Benzo(b)fluoranthene	< 400 U	400	0	SB-037
Benzo(b)fluoranthene	8600	8600	1	SB-038
Benzo(b)fluoranthene	< 430 U	430	0	SB-038
Benzo(b)fluoranthene	< 430 U	430	0	SB-041
Benzo(b)fluoranthene	< 350 U	350	0	SB-041
Benzo(b)fluoranthene	< 440 U	440	0	SB-042
Benzo(b)fluoranthene	< 350 U	350	0	SB-043
Benzo(b)fluoranthene	< 350 U	350	0	SB-043
Benzo(b)fluoranthene	< 350 U	350	0	SB-044
Benzo(b)fluoranthene	< 340 U	340	0	SB-045
Benzo(b)fluoranthene	< 330 U	330	0	SB-049
Benzo(b)fluoranthene	< 340 U	340	0	SB-050
Benzo(ghi)perylene	< 370 U	370	0	FTASB-04
Benzo(ghi)perylene	160	160	1	FTASB-06
Benzo(ghi)perylene	< 420	420	0	FTASB-09

Constituent	Original Data	Result	D_Result	Location ID
Benzo(ghi)perylene	95	95	1	FTASB-13
Benzo(ghi)perylene	< 430 U	430	0	FTASB-13
Benzo(ghi)perylene	850	850	1	FTASB-14
Benzo(ghi)perylene	660	660	1	FTASB-15
Benzo(ghi)perylene	< 350 U	350	0	FTASB-16
Benzo(ghi)perylene	580	580	1	FTASB-17
Benzo(ghi)perylene	210	210	1	HMW-10
Benzo(ghi)perylene	< 410 U	410	0	HMW-10
Benzo(ghi)perylene	2000	2000	1	HMW-11
Benzo(ghi)perylene	440	440	1	HMW-12
Benzo(ghi)perylene	< 400 U	400	0	HMW-13
Benzo(ghi)perylene	< 360 U	360	0	HMW-14
Benzo(ghi)perylene	< 340 U	340	0	HMW-14R
Benzo(ghi)perylene	< 380 U	380	0	HMW-15
Benzo(ghi)perylene	14000	14000	1	HMW-16A
Benzo(ghi)perylene	< 360 U	360	0	HMW-17
Benzo(ghi)perylene	< 420 U	420	0	HMW-18
Benzo(ghi)perylene	< 380 U	380	0	HMW-18
Benzo(ghi)perylene	< 81 U	81	0	HSB-4
Benzo(ghi)perylene	< 180 U	180	0	PSB-1
Benzo(ghi)perylene	< 1900 U	1900	0	PSB-1
Benzo(ghi)perylene	< 180 U	180	0	PSB-2
Benzo(ghi)perylene	< 180 U	180	0	PSB-2
Benzo(ghi)perylene	< 190 U	190	0	PSB-2
Benzo(ghi)perylene	< 190 U	190	0	PSB-2
Benzo(ghi)perylene	< 870 U	870	0	PSB-3
Benzo(ghi)perylene	< 180 U	180	0	PSB-3
Benzo(ghi)perylene	< 170 U	170	0	PSB-5
Benzo(ghi)perylene	< 190 U	190	0	PSB-5
Benzo(ghi)perylene	< 340 U	340	0	SB-018
Benzo(ghi)perylene	< 370 U	370	0	SB-019
Benzo(ghi)perylene	< 360 U	360	0	SB-020
Benzo(ghi)perylene	< 340 U	340	0	SB-021
Benzo(ghi)perylene	< 400 U	400	0	SB-022
Benzo(ghi)perylene	560	560	1	SB-023
Benzo(ghi)perylene	< 480 U	480	0	SB-024
Benzo(ghi)perylene	3800	3800	1	SB-025
Benzo(ghi)perylene	3000	3000	1	SB-026
Benzo(ghi)perylene	9500	9500	1	SB-027
Benzo(ghi)perylene	< 370 U	370	0	SB-028
Benzo(ghi)perylene	< 360 U	360	0	SB-029
Benzo(ghi)perylene	< 350 U	350	0	SB-030
Benzo(ghi)perylene	< 360 U	360	0	SB-035
Benzo(ghi)perylene	5700	5700	1	SB-036
Benzo(ghi)perylene	< 390 U	390	0	SB-036
Benzo(ghi)perylene	< 370 U	370	0	SB-037
Benzo(ghi)perylene	< 400 U	400	0	SB-037
Benzo(ghi)perylene	5500	5500	1	SB-038
Benzo(ghi)perylene	< 430 U	430	0	SB-038
Benzo(ghi)perylene	< 430 U	430	0	SB-041
Benzo(ghi)perylene	< 350 U	350	0	SB-041
Benzo(ghi)perylene	< 440 U	440	0	SB-042
Benzo(ghi)perylene	< 350 U	350	0	SB-043
Benzo(ghi)perylene	< 350 U	350	0	SB-043
Benzo(ghi)perylene	< 350 U	350	0	SB-044
Benzo(ghi)perylene	< 340 U	340	0	SB-045
Benzo(ghi)perylene	< 330 U	330	0	SB-049
Benzo(ghi)perylene	< 340 U	340	0	SB-050
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-04
Benzo(k)fluoranthene	< 340	340	0	FTASB-06
Benzo(k)fluoranthene	< 420	420	0	FTASB-09
Benzo(k)fluoranthene	< 360 U	360	0	FTASB-13
Benzo(k)fluoranthene	< 430 U	430	0	FTASB-13
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-14
Benzo(k)fluoranthene	< 360 U	360	0	FTASB-15
Benzo(k)fluoranthene	< 350 U	350	0	FTASB-16
Benzo(k)fluoranthene	< 350 U	350	0	FTASB-17
Benzo(k)fluoranthene	< 370 U	370	0	HMW-10
Benzo(k)fluoranthene	< 410 U	410	0	HMW-10
Benzo(k)fluoranthene	< 400 U	400	0	HMW-11
Benzo(k)fluoranthene	< 400 U	400	0	HMW-12
Benzo(k)fluoranthene	< 400 U	400	0	HMW-13
Benzo(k)fluoranthene	< 360 U	360	0	HMW-14
Benzo(k)fluoranthene	< 340 U	340	0	HMW-14R
Benzo(k)fluoranthene	< 380 U	380	0	HMW-15
Benzo(k)fluoranthene	27000	27000	1	HMW-16A
Benzo(k)fluoranthene	< 360 U	360	0	HMW-17
Benzo(k)fluoranthene	< 420 U	420	0	HMW-18
Benzo(k)fluoranthene	< 380 U	380	0	HMW-18
Benzo(k)fluoranthene	< 180 U	180	0	HSB-4
Benzo(k)fluoranthene	250	250	1	PSB-1
Benzo(k)fluoranthene	< 1200 U	1200	0	PSB-1
Benzo(k)fluoranthene	150	150	1	PSB-2
Benzo(k)fluoranthene	150	150	1	PSB-2
Benzo(k)fluoranthene	< 120 U	120	0	PSB-2
Benzo(k)fluoranthene	< 120 U	120	0	PSB-2
Benzo(k)fluoranthene	2700	2700	1	PSB-3
Benzo(k)fluoranthene	< 110 U	110	0	PSB-3
Benzo(k)fluoranthene	< 110 U	110	0	PSB-5
Benzo(k)fluoranthene	< 120 U	120	0	PSB-5
Benzo(k)fluoranthene	< 340 U	340	0	SB-018

Constituent	Original Data	Result	D_Result	Location ID
Benzo(k)fluoranthene	< 370 U	370	0	SB-019
Benzo(k)fluoranthene	< 360 U	360	0	SB-020
Benzo(k)fluoranthene	< 340 U	340	0	SB-021
Benzo(k)fluoranthene	< 400 U	400	0	SB-022
Benzo(k)fluoranthene	630	630	1	SB-023
Benzo(k)fluoranthene	< 480 U	480	0	SB-024
Benzo(k)fluoranthene	5600	5600	1	SB-025
Benzo(k)fluoranthene	4900	4900	1	SB-026
Benzo(k)fluoranthene	14000	14000	1	SB-027
Benzo(k)fluoranthene	< 370 U	370	0	SB-028
Benzo(k)fluoranthene	< 360 U	360	0	SB-029
Benzo(k)fluoranthene	< 350 U	350	0	SB-030
Benzo(k)fluoranthene	< 360 U	360	0	SB-035
Benzo(k)fluoranthene	8600	8600	1	SB-036
Benzo(k)fluoranthene	< 390 U	390	0	SB-036
Benzo(k)fluoranthene	< 370 U	370	0	SB-037
Benzo(k)fluoranthene	< 400 U	400	0	SB-037
Benzo(k)fluoranthene	9400	9400	1	SB-038
Benzo(k)fluoranthene	< 430 U	430	0	SB-038
Benzo(k)fluoranthene	< 430 U	430	0	SB-041
Benzo(k)fluoranthene	< 350 U	350	0	SB-041
Benzo(k)fluoranthene	< 440 U	440	0	SB-042
Benzo(k)fluoranthene	< 350 U	350	0	SB-043
Benzo(k)fluoranthene	< 350 U	350	0	SB-043
Benzo(k)fluoranthene	< 350 U	350	0	SB-044
Benzo(k)fluoranthene	< 340 U	340	0	SB-045
Benzo(k)fluoranthene	< 330 U	330	0	SB-049
Benzo(k)fluoranthene	< 340 U	340	0	SB-050
Bis(2-ethylhexyl)phthalate	86 J	86	1	FTASB-04
Bis(2-ethylhexyl)phthalate	160 JL	160	1	FTASB-06
Bis(2-ethylhexyl)phthalate	230 J	230	1	FTASB-09
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	FTASB-13
Bis(2-ethylhexyl)phthalate	< 430 U	430	0	FTASB-13

UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	For ProUCL.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result (acetone)

General Statistics

Number of Valid Data	68	Number of Detected Data	10
Number of Distinct Detected Data	9	Number of Non-Detect Data	58
		Percent Non-Detects	85.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	52	Minimum Detected	3.951
Maximum Detected	24000	Maximum Detected	10.09
Mean of Detected	2765	Mean of Detected	5.477
SD of Detected	7509	SD of Detected	1.965
Minimum Non-Detect	5.6	Minimum Non-Detect	1.723
Maximum Non-Detect	6000	Maximum Non-Detect	8.7

Note: Data have multiple DLs - Use of KM Method is recommended

Number treated as Non-Detect	67
Number treated as Detected	1
Single DL Non-Detect Percentage	98.53%

For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.424	Shapiro Wilk Test Statistic	0.71
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	471.5	Mean	3.473
SD	2937	SD	1.364
95% DL/2 (t) UCL	1066	95% H-Stat (DL/2) UCL	117.6
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.985
		SD in Log Scale	3.287
		Mean in Original Scale	407.1
		SD in Original Scale	2924
		95% t UCL	998.4
		95% Percentile Bootstrap UCL	1110
		95% BCA Bootstrap UCL	1857
		95% H-UCL	429.3

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.266	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10411		
nu star	5.312		
A-D Test Statistic	1.993	Nonparametric Statistics	
5% A-D Critical Value	0.82	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.82	Mean	451.8
5% K-S Critical Value	0.289	SD	2896
Data not Gamma Distributed at 5% Significance Level		SE of Mean	370.2
		95% KM (t) UCL	1069
Assuming Gamma Distribution		95% KM (z) UCL	1061
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1024
Minimum	0.000001	95% KM (bootstrap t) UCL	59512
Maximum	24000	95% KM (BCA) UCL	1179
Mean	406.6	95% KM (Percentile Bootstrap) UCL	1151
Median	0.000001	95% KM (Chebyshev) UCL	2066
SD	2924	97.5% KM (Chebyshev) UCL	2764
k star	0.0589	99% KM (Chebyshev) UCL	4136
Theta star	6901		
Nu star	8.014	Potential UCLs to Use	
AppChi2	2.743	95% KM (Chebyshev) UCL	2066
95% Gamma Approximate UCL (Use when n >= 40)	1188		
95% Adjusted Gamma UCL (Use when n < 40)	1217		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (benzene)

General Statistics

Number of Valid Data	57	Number of Detected Data	13
Number of Distinct Detected Data	12	Number of Non-Detect Data	44
		Percent Non-Detects	77.19%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.8	Minimum Detected	1.03
Maximum Detected	2900	Maximum Detected	7.972
Mean of Detected	523.4	Mean of Detected	4.259
SD of Detected	918.9	SD of Detected	2.33
Minimum Non-Detect	1.3	Minimum Non-Detect	0.262
Maximum Non-Detect	1000	Maximum Non-Detect	6.908

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

		Number treated as Non-Detect	54
		Number treated as Detected	3
		Single DL Non-Detect Percentage	94.74%

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.648
5% Shapiro Wilk Critical Value	0.866

Data not Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.933
5% Shapiro Wilk Critical Value	0.866

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	130.7
SD	481.3
95% DL/2 (t) UCL	237.4
Maximum Likelihood Estimate(MLE) Method	
Mean	2222
SD	697.6
95% MLE (t) UCL	2377
95% MLE (Tiku) UCL	2884

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	1.924
SD	1.843
95% H-Stat (DL/2) UCL	89.68
Log ROS Method	
Mean in Log Scale	-0.818
SD in Log Scale	3.429
Mean in Original Scale	119.7
SD in Original Scale	479.5
95% t UCL	225.9
95% Percentile Bootstrap UCL	234.5
95% BCA Bootstrap UCL	276.5
95% H UCL	2562

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.311
Theta Star	1682
nu star	8.092
A-D Test Statistic	0.737
5% A-D Critical Value	0.822
K-S Test Statistic	0.822
5% K-S Critical Value	0.255

Data appear Gamma Distributed at 5% Significance Level

Data Distribution Test with Detected Values Only

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000001
Maximum	2900
Mean	119.4
Median	0.000001
SD	479.6
k star	0.068
Theta star	1755
Nu star	7.756
AppChi2	2.595
95% Gamma Approximate UCL (Use when n >= 40)	356.8
95% Adjusted Gamma UCL (Use when n < 40)	367.7

Note: DL/2 is not a recommended method.

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	121.9
SD	474.8
SE of Mean	65.47
95% KM (t) UCL	231.4
95% KM (z) UCL	229.6
95% KM (jackknife) UCL	225.9
95% KM (bootstrap t) UCL	400.4
95% KM (BCA) UCL	249.3
95% KM (Percentile Bootstrap) UCL	238.7
95% KM (Chebyshev) UCL	407.3
97.5% KM (Chebyshev) UCL	530.8
99% KM (Chebyshev) UCL	773.3

Potential UCLs to Use

95% KM (t) UCL	231.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (bis(2-ethylhexyl)phthalate)

General Statistics

Number of Valid Data	50	Number of Detected Data	9
Number of Distinct Detected Data	8	Number of Non-Detect Data	41
		Percent Non-Detects	82.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	86	Minimum Detected	4.454
Maximum Detected	420	Maximum Detected	6.04
Mean of Detected	230.7	Mean of Detected	5.292
SD of Detected	131	SD of Detected	0.584
Minimum Non-Detect	330	Minimum Non-Detect	5.799
Maximum Non-Detect	3500	Maximum Non-Detect	8.161

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	50
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.85	Shapiro Wilk Test Statistic	0.912
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	236.4	Mean	5.311
SD	236.9	SD	0.44
95% DL/2 (t) UCL	292.6	95% H-Stat (DL/2) UCL	250.4
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	5.034
		SD in Log Scale	0.368
		Mean in Original Scale	165
		SD in Original Scale	71.89
		95% t UCL	182.1
		95% Percentile Bootstrap UCL	181.4
		95% BCA Bootstrap UCL	185
		95% H-UCL	180.7

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.423	Data appear Normal at 5% Significance Level	
Theta Star	95.21		
nu star	43.61		
A-D Test Statistic	0.498	**Nonparametric Statistics**	
5% A-D Critical Value	0.726	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.726	Mean	166.4
5% K-S Critical Value	0.281	SD	78.84
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	21.26
		95% KM (t) UCL	202
Assuming Gamma Distribution		95% KM (z) UCL	201.3
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	204.7
Minimum	0.000001	95% KM (bootstrap t) UCL	212.4
Maximum	420	95% KM (BCA) UCL	202.4
Mean	190.8	95% KM (Percentile Bootstrap) UCL	202
Median	195.3	95% KM (Chebyshev) UCL	259
SD	92.1	97.5% KM (Chebyshev) UCL	299.1
k star	1.088	99% KM (Chebyshev) UCL	377.9
Theta star	175.4		
Nu star	108.8	**Potential UCLs to Use**	
AppChi2	85.74	95% KM (t) UCL	202
95% Gamma Approximate UCL (Use when n >= 40)	242.2	95% KM (Percentile Bootstrap) UCL	202
95% Adjusted Gamma UCL (Use when n < 40)	243.9		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (cadmium)

General Statistics

Number of Valid Data	41	Number of Detected Data	18
Number of Distinct Detected Data	12	Number of Non-Detect Data	23
		Percent Non-Detects	56.10%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	14	Minimum Detected	2.639
Maximum Detected	2500	Maximum Detected	7.824
Mean of Detected	1361	Mean of Detected	6.213
SD of Detected	975.4	SD of Detected	2.135
Minimum Non-Detect	110	Minimum Non-Detect	4.7
Maximum Non-Detect	2600	Maximum Non-Detect	7.863

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

		Number treated as Non-Detect	41
		Number treated as Detected	0
		Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk Test Statistic	0.677
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	826.9	Mean	5.785
SD	861.8	SD	1.662
95% DL/2 (t) UCL	1054	95% H-Stat (DL/2) UCL	2981
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	5.03
		SD in Log Scale	1.867
		Mean in Original Scale	651.8
		SD in Original Scale	905
		95% t UCL	889.8
		95% Percentile Bootstrap UCL	883.4
		95% BCA Bootstrap UCL	900.9
		95% H-UCL	2424

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.549	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2479		
nu star	19.76		
A-D Test Statistic	2.51	**Nonparametric Statistics**	
5% A-D Critical Value	0.79	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.79	Mean	684.5
5% K-S Critical Value	0.213	SD	944.9
Data not Gamma Distributed at 5% Significance Level		SE of Mean	161.5
		95% KM (t) UCL	956.4
Assuming Gamma Distribution		95% KM (z) UCL	950.1
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	952.9
Minimum	0.000001	95% KM (bootstrap t) UCL	987.6
Maximum	2500	95% KM (BCA) UCL	946.6
Mean	723.6	95% KM (Percentile Bootstrap) UCL	961.8
Median	297.9	95% KM (Chebyshev) UCL	1388
SD	899.2	97.5% KM (Chebyshev) UCL	1693
k star	0.193	99% KM (Chebyshev) UCL	2291
Theta star	3758		
Nu star	15.79	**Potential UCLs to Use**	
AppChi2	7.814	99% KM (Chebyshev) UCL	2291
95% Gamma Approximate UCL (Use when n >= 40)	1462		
95% Adjusted Gamma UCL (Use when n < 40)	1502		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (ethylbenzene)

General Statistics

Number of Valid Data	86	Number of Detected Data	10
Number of Distinct Detected Data	10	Number of Non-Detect Data	76
		Percent Non-Detects	88.37%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	11	Minimum Detected	2.398
Maximum Detected	65000	Maximum Detected	11.08
Mean of Detected	14501	Mean of Detected	6.666
SD of Detected	23397	SD of Detected	3.418
Minimum Non-Detect	1.2	Minimum Non-Detect	0.182
Maximum Non-Detect	53	Maximum Non-Detect	3.97

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

		Number treated as Non-Detect	80
		Number treated as Detected	6
		Single DL Non-Detect Percentage	93.02%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.699	Shapiro Wilk Test Statistic	0.886
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1689	Mean	1.799
SD	8934	SD	2.138
95% DL/2 (t) UCL	3292	95% H-Stat (DL/2) UCL	135.4
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-8.07
		SD in Log Scale	7.193
		Mean in Original Scale	1686
		SD in Original Scale	8934
		95% t UCL	3288
		95% Percentile Bootstrap UCL	3454
		95% BCA Bootstrap UCL	4228
		95% H-UCL	2.16E+11

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	0.238	Data appear Gamma Distributed at 5% Significance Level
Theta Star	60981	
nu star	4.756	
A-D Test Statistic	0.527	**Nonparametric Statistics**
5% A-D Critical Value	0.836	Kaplan-Meier (KM) Method
K-S Test Statistic	0.836	Mean 1696
5% K-S Critical Value	0.291	SD 8880
Data appear Gamma Distributed at 5% Significance Level		SE of Mean 1009
		95% KM (t) UCL 3374
		95% KM (z) UCL 3356
		95% KM (jackknife) UCL 3289
		95% KM (bootstrap t) UCL 6653
		95% KM (BCA) UCL 3469
		95% KM (Percentile Bootstrap) UCL 3375
		95% KM (Chebyshev) UCL 6096
		97.5% KM (Chebyshev) UCL 8000
		99% KM (Chebyshev) UCL 11739

Assuming Gamma Distribution		**Potential UCLs to Use**	
Gamma ROS Statistics using Extrapolated Data		95% KM (t) UCL	3374
Minimum	0.000001		
Maximum	65000		
Mean	1686		
Median	0.000001		
SD	8934		
k star	0.0528		
Theta star	31937		
Nu star	9.081		
AppChi2	3.376		
95% Gamma Approximate UCL (Use when n >= 40)	4536		
95% Adjusted Gamma UCL (Use when n < 40)	4616		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (lead)

General Statistics

Number of Valid Data	49	Number of Detected Data	44
Number of Distinct Detected Data	40	Number of Non-Detect Data	5
		Percent Non-Detects	10.20%

Raw Statistics

Minimum Detected	2000
Maximum Detected	53000
Mean of Detected	10504
SD of Detected	9190
Minimum Non-Detect	5810
Maximum Non-Detect	7620

Log-transformed Statistics

Minimum Detected	7.601
Maximum Detected	10.88
Mean of Detected	8.95
SD of Detected	0.804
Minimum Non-Detect	8.667
Maximum Non-Detect	8.939

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

Number treated as Non-Detect	27
Number treated as Detected	22
Single DL Non-Detect Percentage	55.10%

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.777
5% Shapiro Wilk Critical Value	0.944

Data not Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.944

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	9787
SD	8961
95% DL/2 (t) UCL	11934
Maximum Likelihood Estimate(MLE) Method	
Mean	5096
SD	13800
95% MLE (t) UCL	8403
95% MLE (Tiku) UCL	9455

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	8.868
SD	0.8
95% H-Stat (DL/2) UCL	12524
Log ROS Method	
Mean in Log Scale	8.883
SD in Log Scale	0.787
Mean in Original Scale	9842
SD in Original Scale	8922
95% t UCL	11980
95% Percentile Bootstrap UCL	12085
95% BCA Bootstrap UCL	12627
95% H UCL	12512

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	1.659
Theta Star	6330
nu star	146
A-D Test Statistic	0.497
5% A-D Critical Value	0.764
K-S Test Statistic	0.764
5% K-S Critical Value	0.135

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	2000
Maximum	53000
Mean	9856
Median	6800
SD	8915
k star	1.665
Theta star	5920
Nu star	163.2
AppChi2	134.6
95% Gamma Approximate UCL (Use when n >= 40)	11945
95% Adjusted Gamma UCL (Use when n < 40)	12015

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	9827
SD	8853
SE of Mean	1282
95% KM (t) UCL	11977
95% KM (z) UCL	11935
95% KM (jackknife) UCL	11975
95% KM (bootstrap t) UCL	12681
95% KM (BCA) UCL	12097
95% KM (Percentile Bootstrap) UCL	12106
95% KM (Chebyshev) UCL	15414
97.5% KM (Chebyshev) UCL	17831
99% KM (Chebyshev) UCL	22579

Potential UCLs to Use

95% KM (BCA) UCL	12097

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (mercury)

General Statistics

Number of Valid Data	39	Number of Detected Data	27
Number of Distinct Detected Data	21	Number of Non-Detect Data	12
		Percent Non-Detects	30.77%

Raw Statistics

Minimum Detected	13
Maximum Detected	71
Mean of Detected	32.85
SD of Detected	13.05
Minimum Non-Detect	90
Maximum Non-Detect	110

Log-transformed Statistics

Minimum Detected	2.565
Maximum Detected	4.263
Mean of Detected	3.42
SD of Detected	0.389
Minimum Non-Detect	4.5
Maximum Non-Detect	4.7

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

Number treated as Non-Detect	39
Number treated as Detected	0
Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.924
5% Shapiro Wilk Critical Value	0.923

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	37.79
SD	13.25
95% DL/2 (t) UCL	41.37
Maximum Likelihood Estimate(MLE) Method	N/A

MLE method failed to converge properly

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.984
5% Shapiro Wilk Critical Value	0.923

Data appear Lognormal at 5% Significance Level

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	3.564
SD	0.39
95% H-Stat (DL/2) UCL	42.81
Log ROS Method	
Mean in Log Scale	3.42
SD in Log Scale	0.354
Mean in Original Scale	32.48
SD in Original Scale	11.79
95% t UCL	35.66
95% Percentile Bootstrap UCL	35.46
95% BCA Bootstrap UCL	35.97
95% H-UCL	36.12

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	6.329
Theta Star	5.191
nu star	341.7
A-D Test Statistic	0.258
5% A-D Critical Value	0.746
K-S Test Statistic	0.746
5% K-S Critical Value	0.168

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	13
Maximum	71
Mean	33.23
Median	33
SD	11.67
k star	7.873
Theta star	4.22
Nu star	614.1
AppChi2	557.6
95% Gamma Approximate UCL (Use when n >= 40)	36.59
95% Adjusted Gamma UCL (Use when n < 40)	36.73

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only

Data appear Normal at 5% Significance Level

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	32.85
SD	12.81
SE of Mean	2.511
95% KM (t) UCL	37.09
95% KM (z) UCL	36.98
95% KM (jackknife) UCL	37.11
95% KM (bootstrap t) UCL	37.9
95% KM (BCA) UCL	37.15
95% KM (Percentile Bootstrap) UCL	37.28
95% KM (Chebyshev) UCL	43.8
97.5% KM (Chebyshev) UCL	48.54
99% KM (Chebyshev) UCL	57.84

Potential UCLs to Use

95% KM (Percentile Bootstrap) UCL	37.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (selenium)

General Statistics

Number of Valid Data	37	Number of Detected Data	15
Number of Distinct Detected Data	11	Number of Non-Detect Data	22
		Percent Non-Detects	59.46%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	170	Minimum Detected	5.136
Maximum Detected	1100	Maximum Detected	7.003
Mean of Detected	521.9	Mean of Detected	6.025
SD of Detected	377.3	SD of Detected	0.693
Minimum Non-Detect	260	Minimum Non-Detect	5.561
Maximum Non-Detect	630	Maximum Non-Detect	6.446

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

		Number treated as Non-Detect	33
		Number treated as Detected	4
		Single DL Non-Detect Percentage	89.19%

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.76
5% Shapiro Wilk Critical Value	0.881

Data not Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.865
5% Shapiro Wilk Critical Value	0.881

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	340.2
SD	285.8
95% DL/2 (t) UCL	419.5
Maximum Likelihood Estimate(MLE) Method	
Mean	630
SD	470
95% MLE (t) UCL	760.5
95% MLE (Tiku) UCL	975.5

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	5.604
SD	0.623
95% H-Stat (DL/2) UCL	406.2
Log ROS Method	
Mean in Log Scale	5.698
SD in Log Scale	0.549
Mean in Original Scale	358
SD in Original Scale	276.4
95% t UCL	434.7
95% Percentile Bootstrap UCL	434.5
95% BCA Bootstrap UCL	452.1
95% H UCL	414.6

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	1.891
Theta Star	276
nu star	56.73
A-D Test Statistic	1.045
5% A-D Critical Value	0.746
K-S Test Statistic	0.746
5% K-S Critical Value	0.224

Data follow Appr. Gamma Distribution at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000001
Maximum	1100
Mean	388.6
Median	346.6
SD	284.7
k star	0.773
Theta star	502.8
Nu star	57.19
AppChi2	40.81
95% Gamma Approximate UCL (Use when n >= 40)	544.6
95% Adjusted Gamma UCL (Use when n < 40)	552.7

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only

Data Follow Appr. Gamma Distribution at 5% Significance Level

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	352.2
SD	275.7
SE of Mean	48.26
95% KM (t) UCL	433.7
95% KM (z) UCL	431.6
95% KM (jackknife) UCL	432.4
95% KM (bootstrap t) UCL	452.9
95% KM (BCA) UCL	432.4
95% KM (Percentile Bootstrap) UCL	433.5
95% KM (Chebyshev) UCL	562.6
97.5% KM (Chebyshev) UCL	653.6
99% KM (Chebyshev) UCL	832.4

Potential UCLs to Use

95% KM (t) UCL	433.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (toluene)

General Statistics

Number of Valid Data	78	Number of Detected Data	8
Number of Distinct Detected Data	6	Number of Non-Detect Data	70
		Percent Non-Detects	89.74%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	2200	Maximum Detected	7.696
Mean of Detected	280.4	Mean of Detected	2.054
SD of Detected	775.7	SD of Detected	2.498
Minimum Non-Detect	0.82	Minimum Non-Detect	-0.198
Maximum Non-Detect	53	Maximum Non-Detect	3.97

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

Number treated as Non-Detect	77
Number treated as Detected	1
Single DL Non-Detect Percentage	98.72%

Warning: There are only 8 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.425
5% Shapiro Wilk Critical Value	0.818

Data not Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.753
5% Shapiro Wilk Critical Value	0.818

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	32.37
SD	248.7
95% DL/2 (t) UCL	79.25
Maximum Likelihood Estimate(MLE) Method	N/A

MLE method failed to converge properly

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	1.276
SD	0.94
95% H-Stat (DL/2) UCL	7.061
Log ROS Method	
Mean in Log Scale	0.383
SD in Log Scale	1.415
Mean in Original Scale	30.64
SD in Original Scale	248.8
95% t UCL	77.55
95% Percentile Bootstrap UCL	86.95
95% BCA Bootstrap UCL	115.7
95% H-UCL	6.182

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.211
Theta Star	1327
nu star	3.38
A-D Test Statistic	1.635
5% A-D Critical Value	0.834
K-S Test Statistic	0.834
5% K-S Critical Value	0.323

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000001
Maximum	2200
Mean	54.03
Median	0.000001
SD	255.9
k star	0.073
Theta star	740.6
Nu star	11.38
AppChi2	4.823
95% Gamma Approximate UCL (Use when n >= 40)	127.5
95% Adjusted Gamma UCL (Use when n < 40)	129.7

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	30.41
SD	247.3
SE of Mean	29.93
95% KM (t) UCL	80.24
95% KM (z) UCL	79.64
95% KM (jackknife) UCL	77.15
95% KM (bootstrap t) UCL	3256
95% KM (BCA) UCL	97.12
95% KM (Percentile Bootstrap) UCL	86.82
95% KM (Chebyshev) UCL	160.9
97.5% KM (Chebyshev) UCL	217.3
99% KM (Chebyshev) UCL	328.2

Potential UCLs to Use

97.5% KM (Chebyshev) UCL	217.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Result (xylenes (total))

General Statistics

Number of Valid Data	84	Number of Detected Data	12
Number of Distinct Detected Data	12	Number of Non-Detect Data	72
		Percent Non-Detects	85.71%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	310000	Maximum Detected	12.64
Mean of Detected	48372	Mean of Detected	5.685
SD of Detected	95784	SD of Detected	4.623
Minimum Non-Detect	1.2	Minimum Non-Detect	0.182
Maximum Non-Detect	53	Maximum Non-Detect	3.97

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

		Number treated as Non-Detect	77
		Number treated as Detected	7
		Single DL Non-Detect Percentage	91.67%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.601	Shapiro Wilk Test Statistic	0.889
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6914	Mean	1.843
SD	38805	SD	2.351
95% DL/2 (t) UCL	13957	95% H-Stat (DL/2) UCL	268
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.147
		SD in Log Scale	3.57
		Mean in Original Scale	6913
		SD in Original Scale	38805
		95% t UCL	13956
		95% Percentile Bootstrap UCL	14774
		95% BCA Bootstrap UCL	18699
		95% H-UCL	5780

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.168	Data appear Lognormal at 5% Significance Level	
Theta Star	287091		
nu star	4.044		
A-D Test Statistic	0.95	**Nonparametric Statistics**	
5% A-D Critical Value	0.882	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.882	Mean	6912
5% K-S Critical Value	0.273	SD	38574
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4396
		95% KM (t) UCL	14224
Assuming Gamma Distribution		95% KM (z) UCL	14143
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13955
Minimum	0.000001	95% KM (bootstrap t) UCL	27064
Maximum	310000	95% KM (BCA) UCL	15730
Mean	6955	95% KM (Percentile Bootstrap) UCL	14651
Median	0.000001	95% KM (Chebyshev) UCL	26073
SD	38800	97.5% KM (Chebyshev) UCL	34364
k star	0.0514	99% KM (Chebyshev) UCL	50651
Theta star	135437		
Nu star	8.628	Potential UCLs to Use	
AppChi2	3.104	97.5% KM (Chebyshev) UCL	34364
95% Gamma Approximate UCL (Use when n >= 40)	19335		
95% Adjusted Gamma UCL (Use when n < 40)	19700		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

HMWPAHs

General Statistics

Number of Valid Observations	61	Number of Distinct Observations	42

Raw Statistics

Minimum	589
Maximum	300750
Mean	16552
Geometric Mean	3266
Median	1867
SD	46785
Std. Error of Mean	5990
Coefficient of Variation	2.827
Skewness	4.52

Log-transformed Statistics

Minimum of Log Data	6.378
Maximum of Log Data	12.61
Mean of log Data	8.091
SD of log Data	1.435

Relevant UCL Statistics

Normal Distribution Test

Lilliefors Test Statistic	0.429
Lilliefors Critical Value	0.113

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	26559

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	30109
95% Modified-t UCL (Johnson-1978)	27137

Gamma Distribution Test

k star (bias corrected)	0.396
Theta Star	41827
MLE of Mean	16552
MLE of Standard Deviation	26312
nu star	48.28
Approximate Chi Square Value (.05)	33.33
Adjusted Level of Significance	0.0461
Adjusted Chi Square Value	33.03
Anderson-Darling Test Statistic	11.27
Anderson-Darling 5% Critical Value	0.839
Kolmogorov-Smirnov Test Statistic	0.372
Kolmogorov-Smirnov 5% Critical Value	0.122

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL (Use when n >= 40)	23976
95% Adjusted Gamma UCL (Use when n < 40)	24194

Potential UCL to Use

Lognormal Distribution Test

Lilliefors Test Statistic	0.313
Lilliefors Critical Value	0.113

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	14376
95% Chebyshev (MVUE) UCL	18235
97.5% Chebyshev (MVUE) UCL	22298
99% Chebyshev (MVUE) UCL	30279

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL	26405
95% Jackknife UCL	26559
95% Standard Bootstrap UCL	26668
95% Bootstrap-t UCL	36053
95% Hall's Bootstrap UCL	39888
95% Percentile Bootstrap UCL	27261
95% BCA Bootstrap UCL	32339
95% Chebyshev(Mean, Sd) UCL	42663
97.5% Chebyshev(Mean, Sd) UCL	53961
99% Chebyshev(Mean, Sd) UCL	76154

Use 95% Chebyshev (Mean, Sd) UCL 42663

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

LMWPAHs

General Statistics

Number of Valid Observations	61	Number of Distinct Observations	43

Raw Statistics

Minimum	222
Maximum	90250
Mean	5700
Geometric Mean	1462
Median	1118
SD	15817
Std. Error of Mean	2025
Coefficient of Variation	2.775
Skewness	3.969

Log-transformed Statistics

Minimum of Log Data	5.403
Maximum of Log Data	11.41
Mean of log Data	7.288
SD of log Data	1.278

Relevant UCL Statistics

Normal Distribution Test

Lilliefors Test Statistic	0.441
Lilliefors Critical Value	0.113

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Lilliefors Test Statistic	0.327
Lilliefors Critical Value	0.113

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	9083

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	10131
95% Modified-t UCL (Johnson-1978)	9255

Assuming Lognormal Distribution

95% H-UCL	4832
95% Chebyshev (MVUE) UCL	6173
97.5% Chebyshev (MVUE) UCL	7445
99% Chebyshev (MVUE) UCL	9944

Gamma Distribution Test

k star (bias corrected)	0.459
Theta Star	12421
MLE of Mean	5700
MLE of Standard Deviation	8414
nu star	55.99
Approximate Chi Square Value (.05)	39.79
Adjusted Level of Significance	0.0461
Adjusted Chi Square Value	39.46
Anderson-Darling Test Statistic	11.65
Anderson-Darling 5% Critical Value	0.823
Kolmogorov-Smirnov Test Statistic	0.429
Kolmogorov-Smirnov 5% Critical Value	0.121

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL (Use when n >= 40)	8020
95% Adjusted Gamma UCL (Use when n < 40)	8087

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL	9031
95% Jackknife UCL	9083
95% Standard Bootstrap UCL	9017
95% Bootstrap-t UCL	12396
95% Hall's Bootstrap UCL	9147
95% Percentile Bootstrap UCL	9240
95% BCA Bootstrap UCL	10613
95% Chebyshev(Mean, Sd) UCL	14528
97.5% Chebyshev(Mean, Sd) UCL	18347
99% Chebyshev(Mean, Sd) UCL	25850

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL 14528

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Constituent	Original Data	Result	D_Result	Location ID
1-Methylnaphthalene	6900	6900	1	EB-E7 [Dpu]
1-Methylnaphthalene	13000	13000	1	EB-E8
1-Methylnaphthalene	480 [ND]	480	1	EB-F5 [DUP]
1-Methylnaphthalene	5000	5000	1	EB-F6
1-Methylnaphthalene	15000	15000	1	EB-F7
1-Methylnaphthalene	5500	5500	1	EB-F8
1-Methylnaphthalene	6200	6200	1	EB-G6
1-Methylnaphthalene	10000	10000	1	EB-G7
1-Methylnaphthalene	10000 [7600]	10000	1	EB-G8 [DUP]
1-Methylnaphthalene	8600	8600	1	EB-H5
1-Methylnaphthalene	8300	8300	1	EB-H6
1-Methylnaphthalene	6400	6400	1	EB-H7
1-Methylnaphthalene	5500	5500	1	EB-H8
1-Methylnaphthalene	30000	30000	1	EB-I6
1-Methylnaphthalene	11000	11000	1	EB-I7
1-Methylnaphthalene	5200	5200	1	EB-I8
1-Methylnaphthalene	25000 [--]	25000	1	EB-J6 [DUP]
1-Methylnaphthalene	9500	9500	1	EB-J7
1-Methylnaphthalene	2400	2400	1	EB-J8
1-Methylnaphthalene	26000	26000	1	EB-K4
1-Methylnaphthalene	10000	10000	1	EB-K6
1-Methylnaphthalene	20000	20000	1	EB-K7
1-Methylnaphthalene	6900	6900	1	EB-K8
1-Methylnaphthalene	35000	35000	1	EB-L5
1-Methylnaphthalene	7200	7200	1	EB-L6
1-Methylnaphthalene	15000	15000	1	EB-L7
1-Methylnaphthalene	11000	11000	1	EB-L8
1-Methylnaphthalene	7800	7800	1	EW-E6-a
1-Methylnaphthalene	21000	21000	1	EW-E7-a
1-Methylnaphthalene	7700	7700	1	EW-I4-a
1-Methylnaphthalene	8200	8200	1	EW-L4
1-Methylnaphthalene	15000	15000	1	EW-L5-a
1-Methylnaphthalene	40000	40000	1	EW-L8-B
2-Methylnaphthalene	< 2 U	2	0	BH-13
2-Methylnaphthalene	9600	9600	1	EB-E7 [Dpu]
2-Methylnaphthalene	5800	5800	1	EB-E8
2-Methylnaphthalene	6900	6900	1	EB-F6
2-Methylnaphthalene	25000	25000	1	EB-F7
2-Methylnaphthalene	9200	9200	1	EB-G6
2-Methylnaphthalene	15000	15000	1	EB-G7
2-Methylnaphthalene	9500 [3600]	9500	1	EB-G8 [DUP]
2-Methylnaphthalene	12000	12000	1	EB-H5
2-Methylnaphthalene	11000	11000	1	EB-H6
2-Methylnaphthalene	8700	8700	1	EB-H7
2-Methylnaphthalene	7500	7500	1	EB-H8
2-Methylnaphthalene	39000	39000	1	EB-I6
2-Methylnaphthalene	15000	15000	1	EB-I7
2-Methylnaphthalene	7200	7200	1	EB-I8
2-Methylnaphthalene	27000 [--]	27000	1	EB-J6 [DUP]
2-Methylnaphthalene	8100	8100	1	EB-J7
2-Methylnaphthalene	560	560	1	EB-J8
2-Methylnaphthalene	22000	22000	1	EB-K4
2-Methylnaphthalene	26000	26000	1	EB-K7
2-Methylnaphthalene	5400	5400	1	EB-K8
2-Methylnaphthalene	47000	47000	1	EB-L5
2-Methylnaphthalene	11000	11000	1	EB-L6
2-Methylnaphthalene	21000	21000	1	EB-L7
2-Methylnaphthalene	16000	16000	1	EB-L8
2-Methylnaphthalene	11000	11000	1	EW-E6-a
2-Methylnaphthalene	31000	31000	1	EW-E7-a
2-Methylnaphthalene	11000	11000	1	EW-I4-a
2-Methylnaphthalene	50000	50000	1	EW-L8-B
2-Methylnaphthalene	< 370 U	370	0	FTASB-04
2-Methylnaphthalene	< 400 U	400	0	FTASB-04
2-Methylnaphthalene	< 340 U	340	0	FTASB-06
2-Methylnaphthalene	< 430 U	430	0	FTASB-06
2-Methylnaphthalene	< 420 U	420	0	FTASB-09
2-Methylnaphthalene	< 370 U	370	0	FTASB-09
2-Methylnaphthalene	99000 JL	99000	1	FTASB-10
2-Methylnaphthalene	4500	4500	1	FTASB-11
2-Methylnaphthalene	43000	43000	1	FTASB-12
2-Methylnaphthalene	< 360 U	360	0	FTASB-13

Constituent	Original Data	Result	D_Result	Location ID
2-Methylnaphthalene	< 430 U	430	0	FTASB-13
2-Methylnaphthalene	< 370 U	370	0	FTASB-14
2-Methylnaphthalene	34000	34000	1	FTASB-14
2-Methylnaphthalene	< 360 U	360	0	FTASB-15
2-Methylnaphthalene	< 390 U	390	0	FTASB-15
2-Methylnaphthalene	< 350 U	350	0	FTASB-16
2-Methylnaphthalene	< 390 U	390	0	FTASB-16
2-Methylnaphthalene	< 350 U	350	0	FTASB-17
2-Methylnaphthalene	< 370 U	370	0	FTASB-17
2-Methylnaphthalene	< 78 U	78	0	HA01SB001
2-Methylnaphthalene	16000	16000	1	HA01SB002
2-Methylnaphthalene	< 83 U	83	0	HA01SB003
2-Methylnaphthalene	< 370 U	370	0	HMW-10
2-Methylnaphthalene	< 410 U	410	0	HMW-10
2-Methylnaphthalene	< 400 U	400	0	HMW-11
2-Methylnaphthalene	640	640	1	HMW-11
2-Methylnaphthalene	< 400 U	400	0	HMW-12
2-Methylnaphthalene	< 400 U	400	0	HMW-12
2-Methylnaphthalene	32000	32000	1	HMW-13
2-Methylnaphthalene	280 JQ	280	1	HMW-13
Acenaphthene	< 370 U	370	0	FTASB-04
Acenaphthene	< 400 U	400	0	FTASB-04
Acenaphthene	< 340 U	340	0	FTASB-06
Acenaphthene	< 430 U	430	0	FTASB-06
Acenaphthene	< 420 U	420	0	FTASB-09
Acenaphthene	< 370 U	370	0	FTASB-09
Acenaphthene	< 1600 JL	1600	0	FTASB-10
Acenaphthene	< 400 U	400	0	FTASB-11
Acenaphthene	< 1600 U	1600	0	FTASB-12
Acenaphthene	< 360 U	360	0	FTASB-13
Acenaphthene	< 430 U	430	0	FTASB-13
Acenaphthene	< 370 U	370	0	FTASB-14
Acenaphthene	620	620	1	FTASB-14
Acenaphthene	< 360 U	360	0	FTASB-15
Acenaphthene	< 390 U	390	0	FTASB-15
Acenaphthene	< 350 U	350	0	FTASB-16
Acenaphthene	< 390 U	390	0	FTASB-16
Acenaphthene	< 350 U	350	0	FTASB-17
Acenaphthene	< 370 U	370	0	FTASB-17
Acenaphthene	< 78 U	78	0	HA01SB001
Acenaphthene	< 71 U	71	0	HA01SB002
Acenaphthene	< 83 U	83	0	HA01SB003
Acenaphthene	< 370 U	370	0	HMW-10
Acenaphthene	< 410 U	410	0	HMW-10
Acenaphthene	170 JQ	170	1	HMW-11
Acenaphthene	110 JQ	110	1	HMW-11
Acenaphthene	< 400 U	400	0	HMW-12
Acenaphthene	< 400 U	400	0	HMW-12
Acenaphthene	< 400 U	400	0	HMW-13
Acenaphthene	< 380 U	380	0	HMW-13
Acenaphthene	< 360 U	360	0	HMW-14
Acenaphthene	< 360 U	360	0	HMW-14
Acenaphthene	< 340 U	340	0	HMW-14R
Acenaphthene	< 360 U	360	0	HMW-14R
Acenaphthene	< 380 U	380	0	HMW-15
Acenaphthene	< 360 U	360	0	HMW-15
Acenaphthene	< 3500 U	3500	0	HMW-16A
Acenaphthene	< 790 U	790	0	HMW-16A
Acenaphthene	< 360 U	360	0	HMW-17
Acenaphthene	< 370 U	370	0	HMW-17
Acenaphthene	< 420 U	420	0	HMW-18
Acenaphthene	< 380 U	380	0	HMW-18
Acenaphthene	< 130 U	130	0	HSB-1
Acenaphthene	< 150 U	150	0	HSB-3
Acenaphthene	< 150 U	150	0	HSB-4
Acenaphthene	< 160 U	160	0	HSB-5
Acenaphthene	< 150 U	150	0	HSB-6
Acenaphthene	< 78 U	78	0	PSB-1
Acenaphthene	< 85000 U	85000	0	PSB-1
Acenaphthene	< 81 U	81	0	PSB-2
Acenaphthene	< 81 U	81	0	PSB-2
Acenaphthene	< 84 U	84	0	PSB-2

Constituent	Original Data	Result	D_Result	Location ID
Acenaphthene	< 83 U	83	0	PSB-2
Acenaphthene	< 380 U	380	0	PSB-3
Acenaphthene	< 80 U	80	0	PSB-3
Acenaphthene	< 74 U	74	0	PSB-5
Acenaphthene	< 82 U	82	0	PSB-5
Acenaphthene	< 3900 U	3900	0	PSB-6
Acenaphthene	< 80 U	80	0	PSB-7
Acenaphthene	< 340 U	340	0	SB-018
Acenaphthene	< 360 U	360	0	SB-018
Acenaphthene	< 370 U	370	0	SB-019
Acenaphthene	< 370 U	370	0	SB-019
Acenaphthene	< 360 U	360	0	SB-020
Acenaphthene	< 350 U	350	0	SB-020
Acenaphthene	< 340 U	340	0	SB-021
Acenaphthene	< 390 U	390	0	SB-021
Acenaphthene	< 400 U	400	0	SB-022
Acenaphthene	< 400 U	400	0	SB-022
Acenaphthene	< 360 U	360	0	SB-023
Acenaphthene	< 410 U	410	0	SB-023
Acenaphthene	< 480 U	480	0	SB-024
Acenaphthene	< 410 U	410	0	SB-024
Acenaphthene	< 370 U	370	0	SB-025
Acenaphthene	< 390 U	390	0	SB-025
Acenaphthene	< 410 U	410	0	SB-026
Acenaphthene	< 410 U	410	0	SB-026
Acenaphthene	< 1400 U	1400	0	SB-027
Acenaphthene	< 400 U	400	0	SB-027
Acenaphthene	< 370 U	370	0	SB-028
Acenaphthene	< 380 U	380	0	SB-028
Acenaphthene	< 360 U	360	0	SB-029
Acenaphthene	< 370 U	370	0	SB-029
Acenaphthene	< 350 U	350	0	SB-030
Acenaphthene	2300	2300	1	SB-030
Acenaphthene	< 360 U	360	0	SB-035
Acenaphthene	< 350 U	350	0	SB-035
Acenaphthene	< 360 U	360	0	SB-036
Acenaphthene	< 390 U	390	0	SB-036
Acenaphthene	< 370 U	370	0	SB-037
Acenaphthene	< 400 U	400	0	SB-037
Acenaphthene	1700	1700	1	SB-038
Acenaphthene	< 430 U	430	0	SB-038
Acenaphthene	< 430 U	430	0	SB-041
Acenaphthene	< 350 U	350	0	SB-041
Acenaphthene	< 440 U	440	0	SB-042
Acenaphthene	< 350 U	350	0	SB-043
Acenaphthene	< 350 U	350	0	SB-043
Acenaphthene	< 350 U	350	0	SB-044
Acenaphthene	< 380 U	380	0	SB-044
Acenaphthene	< 340 UJL	340	0	SB-045
Acenaphthene	< 340 U	340	0	SB-046
Acenaphthene	< 330 UJL	330	0	SB-049
Acenaphthene	< 340 U	340	0	SB-050
Acenaphthylene	< 370 U	370	0	FTASB-04
Acenaphthylene	120 J	120	1	FTASB-04
Acenaphthylene	< 340 U	340	0	FTASB-06
Acenaphthylene	< 430 U	430	0	FTASB-06
Acenaphthylene	< 420 U	420	0	FTASB-09
Acenaphthylene	< 370 U	370	0	FTASB-09
Acenaphthylene	< 1600 JL	1600	0	FTASB-10
Acenaphthylene	< 400 U	400	0	FTASB-11
Acenaphthylene	< 1600 U	1600	0	FTASB-12
Acenaphthylene	< 360 U	360	0	FTASB-13
Acenaphthylene	< 430 U	430	0	FTASB-13
Acenaphthylene	150 JQ	150	1	FTASB-14
Acenaphthylene	< 390 U	390	0	FTASB-14
Acenaphthylene	260 JQ	260	1	FTASB-15
Acenaphthylene	< 390 U	390	0	FTASB-15
Acenaphthylene	< 350 U	350	0	FTASB-16
Acenaphthylene	< 390 U	390	0	FTASB-16
Acenaphthylene	240 JQ	240	1	FTASB-17
Acenaphthylene	390	390	1	FTASB-17
Acenaphthylene	< 78 U	78	0	HA01SB001

Constituent	Original Data	Result	D_Result	Location ID
Acenaphthylene	< 71 U	71	0	HA01SB002
Acenaphthylene	< 83 U	83	0	HA01SB003
Acenaphthylene	< 370 U	370	0	HMW-10
Acenaphthylene	< 410 U	410	0	HMW-10
Acenaphthylene	710	710	1	HMW-11
Acenaphthylene	590	590	1	HMW-11
Acenaphthylene	110 JQ	110	1	HMW-12
Acenaphthylene	150 JQ	150	1	HMW-12
Acenaphthylene	< 400 U	400	0	HMW-13
Acenaphthylene	< 380 U	380	0	HMW-13
Acenaphthylene	< 360 U	360	0	HMW-14
Acenaphthylene	470	470	1	HMW-14
Acenaphthylene	< 340 U	340	0	HMW-14R
Acenaphthylene	< 360 U	360	0	HMW-14R
Acenaphthylene	< 380 U	380	0	HMW-15
Acenaphthylene	< 360 U	360	0	HMW-15
Acenaphthylene	3600	3600	1	HMW-16A
Acenaphthylene	1500	1500	1	HMW-16A
Acenaphthylene	< 360 U	360	0	HMW-17
Acenaphthylene	< 370 U	370	0	HMW-17
Acenaphthylene	< 420 U	420	0	HMW-18
Acenaphthylene	< 380 U	380	0	HMW-18
Acenaphthylene	< 96 U	96	0	HSB-1
Acenaphthylene	< 110 U	110	0	HSB-3
Acenaphthylene	< 110 U	110	0	HSB-4
Acenaphthylene	< 120 U	120	0	HSB-5
Acenaphthylene	< 110 U	110	0	HSB-6
Acenaphthylene	< 170 U	170	0	PSB-1
Acenaphthylene	< 1800 U	1800	0	PSB-1
Acenaphthylene	< 170 U	170	0	PSB-2
Acenaphthylene	< 81 U	81	0	PSB-2
Acenaphthylene	< 180 U	180	0	PSB-2
Acenaphthylene	< 83 U	83	0	PSB-2
Acenaphthylene	< 810 U	810	0	PSB-3
Acenaphthylene	< 170 U	170	0	PSB-3
Acenaphthylene	< 74 U	74	0	PSB-5
Acenaphthylene	< 82 U	82	0	PSB-5
Acenaphthylene	< 8400 U	8400	0	PSB-6
Acenaphthylene	< 80 U	80	0	PSB-7
Acenaphthylene	< 340 U	340	0	SB-018
Acenaphthylene	< 360 U	360	0	SB-018
Acenaphthylene	< 370 U	370	0	SB-019
Acenaphthylene	< 370 U	370	0	SB-019
Acenaphthylene	< 360 U	360	0	SB-020
Acenaphthylene	< 350 U	350	0	SB-020
Acenaphthylene	< 340 U	340	0	SB-021
Acenaphthylene	< 390 U	390	0	SB-021
Acenaphthylene	< 400 U	400	0	SB-022
Acenaphthylene	< 400 U	400	0	SB-022
Acenaphthylene	< 360 U	360	0	SB-023
Acenaphthylene	< 410 U	410	0	SB-023
Acenaphthylene	< 480 U	480	0	SB-024
Acenaphthylene	< 410 U	410	0	SB-024
Acenaphthylene	1600	1600	1	SB-025
Acenaphthylene	< 390 U	390	0	SB-025
Acenaphthylene	830	830	1	SB-026
Acenaphthylene	< 410 U	410	0	SB-026
Acenaphthylene	2400	2400	1	SB-027
Acenaphthylene	< 400 U	400	0	SB-027
Acenaphthylene	< 370 U	370	0	SB-028
Acenaphthylene	< 380 U	380	0	SB-028
Acenaphthylene	< 360 U	360	0	SB-029
Acenaphthylene	< 370 U	370	0	SB-029
Acenaphthylene	< 350 U	350	0	SB-030
Acenaphthylene	6600	6600	1	SB-030
Acenaphthylene	< 360 U	360	0	SB-035
Acenaphthylene	< 350 U	350	0	SB-035
Acenaphthylene	970	970	1	SB-036
Acenaphthylene	< 390 U	390	0	SB-036
Acenaphthylene	< 370 U	370	0	SB-037
Acenaphthylene	< 400 U	400	0	SB-037
Acenaphthylene	1100	1100	1	SB-038

Constituent	Original Data	Result	D_Result	Location ID
Acenaphthylene	< 430 U	430	0	SB-038
Acenaphthylene	< 430 U	430	0	SB-041
Acenaphthylene	< 350 U	350	0	SB-041
Acenaphthylene	< 440 U	440	0	SB-042
Acenaphthylene	< 350 U	350	0	SB-043
Acenaphthylene	< 350 U	350	0	SB-043
Acenaphthylene	< 350 U	350	0	SB-044
Acenaphthylene	< 380 U	380	0	SB-044
Acenaphthylene	< 340 UJL	340	0	SB-045
Acenaphthylene	< 340 U	340	0	SB-046
Acenaphthylene	< 330 UJL	330	0	SB-049
Acenaphthylene	< 340 U	340	0	SB-050
Acetone	< 22 U	22	0	FTASB-04
Acetone	< 24 U	24	0	FTASB-04
Acetone	< 21 U	21	0	FTASB-06
Acetone	36	36	1	FTASB-06
Acetone	< 25 U	25	0	FTASB-09
Acetone	59	59	1	FTASB-09
Acetone	< 3000 U	3000	0	FTASB-10
Acetone	160	160	1	FTASB-11
Acetone	< 3100 U	3100	0	FTASB-12
Acetone	< 22 U	22	0	FTASB-13
Acetone	< 26 U	26	0	FTASB-13
Acetone	140	140	1	FTASB-14
Acetone	1000	1000	1	FTASB-14
Acetone	< 22 U	22	0	FTASB-15
Acetone	110	110	1	FTASB-15
Acetone	52	52	1	FTASB-16
Acetone	110	110	1	FTASB-16
Acetone	88	88	1	FTASB-17
Acetone	< 22 U	22	0	FTASB-17
Acetone	< 22 U	22	0	HA01-MW-09
Acetone	< 20 U	20	0	HA01-MW-09
Acetone	< 35 U	35	0	HA01-MW-10
Acetone	< 27 U	27	0	HA01-MW-10
Acetone	< 27 U	27	0	HA01-MW-11
Acetone	< 23 U	23	0	HA01-MW-11
Acetone	< 20 U	20	0	HA01-MW-11 (DUP
Acetone	24 UB	24	0	HA01-MW-12
Acetone	< 23 U	23	0	HA01-MW-12
Acetone	< 28 U	28	0	HA01-MW-13
Acetone	< 22 U	22	0	HA01-MW-13
Acetone	< 25 U	25	0	HA01-MW-14
Acetone	< 24 U	24	0	HA01-MW-14
Acetone	< 25 U	25	0	HA01-MW-15
Acetone	< 28 U	28	0	HA01-MW-15
Acetone	< 22 U	22	0	HA01-MW-16
Acetone	< 25 UJ	25	0	HA01-MW-17
Acetone	36 J	36	1	HA01-MW-17
Acetone	< 23 U	23	0	HMW-10
Acetone	2800	2800	1	HMW-10
Acetone	24000	24000	1	HMW-11
Acetone	2300	2300	1	HMW-11
Acetone	< 24 U	24	0	HMW-12
Acetone	1200	1200	1	HMW-12
Acetone	< 6000 U	6000	0	HMW-13
Acetone	2100	2100	1	HMW-13
Acetone	< 57 U	57	0	HMW-14
Acetone	95	95	1	HMW-14
Acetone	< 52 U	52	0	HMW-14R
Acetone	< 54 U	54	0	HMW-14R
Acetone	75	75	1	HMW-15
Acetone	170	170	1	HMW-15
Acetone	170	170	1	HMW-16A
Acetone	< 65 U	65	0	HMW-16A
Acetone	< 60 U	60	0	HMW-17
Acetone	95	95	1	HMW-17
Acetone	< 54 U	54	0	HMW-18
Acetone	< 64 U	64	0	HMW-18
Acetone	< 18 U	18	0	HSB-1
Acetone	< 2500 U	2500	0	HSB-3
Acetone	< 20 U	20	0	HSB-4

Constituent	Original Data	Result	D_Result	Location ID
Acetone	27000	27000	1	HSB-5
Acetone	< 20 U	20	0	HSB-6
Acetone	< 5.6 U	5.6	0	SB-018
Acetone	< 58 U	58	0	SB-018
Acetone	< 64 U	64	0	SB-019
Acetone	< 64 U	64	0	SB-019
Acetone	< 62 U	62	0	SB-020
Acetone	< 62 U	62	0	SB-020
Acetone	< 64 U	64	0	SB-021
Acetone	< 67 U	67	0	SB-021
Acetone	< 66 U	66	0	SB-022
Acetone	< 54 U	54	0	SB-022
Acetone	< 64 U	64	0	SB-023
Acetone	110	110	1	SB-023
Acetone	160	160	1	SB-024
Acetone	140	140	1	SB-024
Acetone	< 56 U	56	0	SB-025
Acetone	< 60 U	60	0	SB-025
Acetone	79	79	1	SB-026
Acetone	< 65 U	65	0	SB-026
Acetone	< 65 U	65	0	SB-027
Acetone	< 56 U	56	0	SB-027
Acetone	< 67 U	67	0	SB-028
Acetone	< 61 U	61	0	SB-028
Acetone	< 64 U	64	0	SB-029
Acetone	< 62 U	62	0	SB-029
Acetone	< 53 U	53	0	SB-030
Acetone	< 55 U	55	0	SB-030
Acetone	< 53 U	53	0	SB-031
Acetone	< 53 U	53	0	SB-031
Acetone	< 53 U	53	0	SB-033
Acetone	< 53 U	53	0	SB-033
Acetone	< 54 U	54	0	SB-034
Acetone	< 56 U	56	0	SB-034
Acetone	< 55 U	55	0	SB-035
Acetone	< 52 U	52	0	SB-035
Acetone	< 55 U	55	0	SB-036
Acetone	< 60 U	60	0	SB-036
Acetone	< 56 U	56	0	SB-037
Acetone	< 61 U	61	0	SB-037
Acetone	< 57 U	57	0	SB-038
Acetone	< 66 UJ	66	0	SB-038
Acetone	< 59 U	59	0	SB-039
Acetone	< 300 U	300	0	SB-039
Acetone	< 57 U	57	0	SB-040
Acetone	< 63 U	63	0	SB-040
Acetone	< 60 U	60	0	SB-041
Acetone	88 JB	88	1	SB-043
Acetone	< 60 U	60	0	SB-043
Acetone	< 60 U	60	0	SB-043A
Acetone	< 58 U	58	0	SB-044
Acetone	< 59 U	59	0	SB-044
Acetone	< 60 U	60	0	SB-046
Anthracene	< 370 U	370	0	FTASB-04
Anthracene	150 J	150	1	FTASB-04
Anthracene	140 J	140	1	FTASB-06
Anthracene	< 430 U	430	0	FTASB-06
Anthracene	< 420 U	420	0	FTASB-09
Anthracene	140 J	140	1	FTASB-09
Anthracene	300 J	300	1	FTASB-10
Anthracene	< 400 U	400	0	FTASB-11
Anthracene	< 1600 JL	1600	0	FTASB-12
Anthracene	< 360 U	360	0	FTASB-13
Anthracene	< 430 U	430	0	FTASB-13
Anthracene	130 JQ	130	1	FTASB-14
Anthracene	94 JQ	94	1	FTASB-14
Anthracene	150 JQ	150	1	FTASB-15
Anthracene	< 390 U	390	0	FTASB-15
Anthracene	< 350 U	350	0	FTASB-16
Anthracene	< 390 U	390	0	FTASB-16
Anthracene	150 JQ	150	1	FTASB-17
Anthracene	190 JQ	190	1	FTASB-17

Constituent	Original Data	Result	D_Result	Location ID
Anthracene	< 78 U	78	0	HA01SB001
Anthracene	< 71 U	71	0	HA01SB002
Anthracene	< 83 U	83	0	HA01SB003
Anthracene	42 JQ	42	1	HMW-10
Anthracene	< 410 U	410	0	HMW-10
Anthracene	1900	1900	1	HMW-11
Anthracene	720	720	1	HMW-11
Anthracene	110 JQ	110	1	HMW-12
Anthracene	160 JQ	160	1	HMW-12
Anthracene	< 400 U	400	0	HMW-13
Anthracene	< 380 U	380	0	HMW-13
Anthracene	< 360 U	360	0	HMW-14
Anthracene	< 360 U	360	0	HMW-14
Anthracene	< 340 U	340	0	HMW-14R
Anthracene	< 360 U	360	0	HMW-14R
Anthracene	< 380 U	380	0	HMW-15
Anthracene	< 360 U	360	0	HMW-15
Anthracene	7500	7500	1	HMW-16A
Anthracene	2200	2200	1	HMW-16A
Anthracene	< 360 U	360	0	HMW-17
Anthracene	< 370 U	370	0	HMW-17
Anthracene	< 420 U	420	0	HMW-18
Anthracene	< 380 U	380	0	HMW-18
Anthracene	< 75 U	75	0	HSB-1
Anthracene	< 85 U	85	0	HSB-3
Anthracene	< 83 U	83	0	HSB-4
Anthracene	< 91 U	91	0	HSB-5
Anthracene	< 85 U	85	0	HSB-6
Anthracene	< 78 U	78	0	PSB-1
Anthracene	< 85000 U	85000	0	PSB-1
Anthracene	< 81 U	81	0	PSB-2
Anthracene	< 81 U	81	0	PSB-2
Anthracene	< 84 U	84	0	PSB-2
Anthracene	< 83 U	83	0	PSB-2
Anthracene	670	670	1	PSB-3
Anthracene	< 80 U	80	0	PSB-3
Anthracene	< 74 U	74	0	PSB-5
Anthracene	< 82 U	82	0	PSB-5
Anthracene	< 3900 U	3900	0	PSB-6
Anthracene	< 80 U	80	0	PSB-7
Anthracene	< 340 U	340	0	SB-018
Anthracene	< 360 U	360	0	SB-018
Anthracene	< 370 U	370	0	SB-019
Anthracene	< 370 U	370	0	SB-019
Anthracene	< 360 U	360	0	SB-020
Anthracene	< 350 U	350	0	SB-020
Anthracene	< 340 U	340	0	SB-021
Anthracene	< 390 U	390	0	SB-021
Anthracene	< 400 U	400	0	SB-022
Anthracene	< 400 U	400	0	SB-022
Anthracene	< 360 U	360	0	SB-023
Anthracene	< 410 U	410	0	SB-023
Anthracene	< 480 U	480	0	SB-024
Anthracene	< 410 U	410	0	SB-024
Anthracene	1500	1500	1	SB-025
Anthracene	< 390 U	390	0	SB-025
Anthracene	2200	2200	1	SB-026
Anthracene	< 410 U	410	0	SB-026
Anthracene	2800	2800	1	SB-027
Anthracene	< 400 U	400	0	SB-027
Anthracene	< 370 U	370	0	SB-028
Anthracene	< 380 U	380	0	SB-028
Anthracene	< 360 U	360	0	SB-029
Anthracene	< 370 U	370	0	SB-029
Anthracene	< 350 U	350	0	SB-030
Anthracene	5700	5700	1	SB-030
Anthracene	< 360 U	360	0	SB-035
Anthracene	< 350 U	350	0	SB-035
Anthracene	870	870	1	SB-036
Anthracene	< 390 U	390	0	SB-036
Anthracene	< 370 U	370	0	SB-037
Anthracene	< 400 U	400	0	SB-037

Constituent	Original Data	Result	D_Result	Location ID
Anthracene	7400	7400	1	SB-038
Anthracene	< 430 U	430	0	SB-038
Anthracene	< 430 U	430	0	SB-041
Anthracene	< 350 U	350	0	SB-041
Anthracene	< 440 U	440	0	SB-042
Anthracene	< 350 U	350	0	SB-043
Anthracene	< 350 U	350	0	SB-043
Anthracene	< 350 U	350	0	SB-044
Anthracene	< 380 U	380	0	SB-044
Anthracene	< 340 UJL	340	0	SB-045
Anthracene	< 340 U	340	0	SB-046
Anthracene	< 330 UJL	330	0	SB-049
Anthracene	< 340 U	340	0	SB-050
Benz(a)anthracene	< 370 U	370	0	FTASB-04
Benz(a)anthracene	100 J	100	1	FTASB-04
Benz(a)anthracene	170 J	170	1	FTASB-06
Benz(a)anthracene	< 430 U	430	0	FTASB-06
Benz(a)anthracene	< 420 U	420	0	FTASB-09
Benz(a)anthracene	64 J	64	1	FTASB-09
Benz(a)anthracene	< 1600 JL	1600	0	FTASB-10
Benz(a)anthracene	< 400 U	400	0	FTASB-11
Benz(a)anthracene	300 JL	300	1	FTASB-12
Benz(a)anthracene	160 JQ	160	1	FTASB-13
Benz(a)anthracene	99 JQ	99	1	FTASB-13
Benz(a)anthracene	930	930	1	FTASB-14
Benz(a)anthracene	200 JQ	200	1	FTASB-14
Benz(a)anthracene	730	730	1	FTASB-15
Benz(a)anthracene	< 390 U	390	0	FTASB-15
Benz(a)anthracene	< 350 U	350	0	FTASB-16
Benz(a)anthracene	< 390 U	390	0	FTASB-16
Benz(a)anthracene	630	630	1	FTASB-17
Benz(a)anthracene	1400	1400	1	FTASB-17
Benz(a)anthracene	< 78 U	78	0	HA01SB001
Benz(a)anthracene	< 71 U	71	0	HA01SB002
Benz(a)anthracene	< 83 U	83	0	HA01SB003
Benz(a)anthracene	340 JQ	340	1	HMW-10
Benz(a)anthracene	< 410 U	410	0	HMW-10
Benz(a)anthracene	8000	8000	1	HMW-11
Benz(a)anthracene	3600	3600	1	HMW-11
Benz(a)anthracene	840	840	1	HMW-12
Benz(a)anthracene	1100	1100	1	HMW-12
Benz(a)anthracene	61 JQ	61	1	HMW-13
Benz(a)anthracene	< 380 U	380	0	HMW-13
Benz(a)anthracene	< 360 U	360	0	HMW-14
Benz(a)anthracene	1800	1800	1	HMW-14
Benz(a)anthracene	< 340 U	340	0	HMW-14R
Benz(a)anthracene	< 360 U	360	0	HMW-14R
Benz(a)anthracene	< 380 U	380	0	HMW-15
Benz(a)anthracene	< 360 U	360	0	HMW-15
Benz(a)anthracene	34000	34000	1	HMW-16A
Benz(a)anthracene	13000	13000	1	HMW-16A
Benz(a)anthracene	< 360 U	360	0	HMW-17
Benz(a)anthracene	< 370 U	370	0	HMW-17
Benz(a)anthracene	< 420 U	420	0	HMW-18
Benz(a)anthracene	< 380 U	380	0	HMW-18
Benz(a)anthracene	< 62 U	62	0	HSB-1
Benz(a)anthracene	< 70 U	70	0	HSB-3
Benz(a)anthracene	< 68 U	68	0	HSB-4
Benz(a)anthracene	< 75 U	75	0	HSB-5
Benz(a)anthracene	< 70 U	70	0	HSB-6
Benz(a)anthracene	370	370	1	PSB-1
Benz(a)anthracene	< 1200 U	1200	0	PSB-1
Benz(a)anthracene	170	170	1	PSB-2
Benz(a)anthracene	140	140	1	PSB-2
Benz(a)anthracene	< 120 U	120	0	PSB-2
Benz(a)anthracene	< 120 U	120	0	PSB-2
Benz(a)anthracene	5300	5300	1	PSB-3
Benz(a)anthracene	< 110 U	110	0	PSB-3
Benz(a)anthracene	< 110 U	110	0	PSB-5
Benz(a)anthracene	< 120 U	120	0	PSB-5
Benz(a)anthracene	< 5600 U	5600	0	PSB-6
Benz(a)anthracene	< 110 U	110	0	PSB-7

Constituent	Original Data	Result	D_Result	Location ID
Benz(a)anthracene	< 340 U	340	0	SB-018
Benz(a)anthracene	< 360 U	360	0	SB-018
Benz(a)anthracene	< 370 U	370	0	SB-019
Benz(a)anthracene	< 370 U	370	0	SB-019
Benz(a)anthracene	< 360 U	360	0	SB-020
Benz(a)anthracene	< 350 U	350	0	SB-020
Benz(a)anthracene	< 340 U	340	0	SB-021
Benz(a)anthracene	< 390 U	390	0	SB-021
Benz(a)anthracene	< 400 U	400	0	SB-022
Benz(a)anthracene	< 400 U	400	0	SB-022
Benz(a)anthracene	510	510	1	SB-023
Benz(a)anthracene	< 410 U	410	0	SB-023
Benz(a)anthracene	< 480 U	480	0	SB-024
Benz(a)anthracene	< 410 U	410	0	SB-024
Benz(a)anthracene	7400	7400	1	SB-025
Benz(a)anthracene	< 390 U	390	0	SB-025
Benz(a)anthracene	6800	6800	1	SB-026
Benz(a)anthracene	< 410 U	410	0	SB-026
Benz(a)anthracene	17000	17000	1	SB-027
Benz(a)anthracene	< 400 U	400	0	SB-027
Benz(a)anthracene	< 370 U	370	0	SB-028
Benz(a)anthracene	< 380 U	380	0	SB-028
Benz(a)anthracene	< 360 U	360	0	SB-029
Benz(a)anthracene	< 370 U	370	0	SB-029
Benz(a)anthracene	< 350 U	350	0	SB-030
Benz(a)anthracene	18000	18000	1	SB-030
Benz(a)anthracene	< 360 U	360	0	SB-035
Benz(a)anthracene	< 350 U	350	0	SB-035
Benz(a)anthracene	8700	8700	1	SB-036
Benz(a)anthracene	< 390 U	390	0	SB-036
Benz(a)anthracene	< 370 U	370	0	SB-037
Benz(a)anthracene	< 400 U	400	0	SB-037
Benz(a)anthracene	15000	15000	1	SB-038
Benz(a)anthracene	< 430 U	430	0	SB-038
Benz(a)anthracene	< 430 U	430	0	SB-041
Benz(a)anthracene	< 350 U	350	0	SB-041
Benz(a)anthracene	< 440 U	440	0	SB-042
Benz(a)anthracene	< 350 U	350	0	SB-043
Benz(a)anthracene	< 350 U	350	0	SB-043
Benz(a)anthracene	< 350 U	350	0	SB-044
Benz(a)anthracene	< 380 U	380	0	SB-044
Benz(a)anthracene	< 340 UJL	340	0	SB-045
Benz(a)anthracene	< 340 U	340	0	SB-046
Benz(a)anthracene	< 330 UJL	330	0	SB-049
Benz(a)anthracene	< 340 U	340	0	SB-050
Benzene	< 5 U	5	0	EB-E6
Benzene	190 J	190	1	EB-E7 [Dpu]
Benzene	120 J	120	1	EB-E8
Benzene	14 J [140 J]	140	1	EB-F5 [DUP]
Benzene	170 J	170	1	EB-F6
Benzene	1400	1400	1	EB-F7
Benzene	1400 J	1400	1	EB-F8
Benzene	< 25 U	25	0	EB-G5
Benzene	400 J	400	1	EB-G6
Benzene	< 1300 U	1300	0	EB-G7
Benzene	470 J [680]	680	1	EB-G8 [DUP]
Benzene	< 10 U	10	0	EB-H4
Benzene	1100 J	1100	1	EB-H5
Benzene	960 J	960	1	EB-H6
Benzene	430 J	430	1	EB-H7
Benzene	< 2500 U	2500	0	EB-H8
Benzene	< 5 U	5	0	EB-I4
Benzene	< 5 U [< 5 U]	5	0	EB-I5 [DUP]
Benzene	< 2500 U	2500	0	EB-I6
Benzene	560 J	560	1	EB-I7
Benzene	< 2500 U	2500	0	EB-I8
Benzene	10	10	1	EB-J4
Benzene	16	16	1	EB-J5
Benzene	3900 [--]	3900	1	EB-J6 [DUP]
Benzene	3400	3400	1	EB-J7
Benzene	1300	1300	1	EB-J8
Benzene	930	930	1	EB-K4

Constituent	Original Data	Result	D_Result	Location ID
Benzene	89 J	89	1	EB-K5
Benzene	1300	1300	1	EB-K6
Benzene	6900	6900	1	EB-K7
Benzene	1400	1400	1	EB-K8
Benzene	1200	1200	1	EB-L5
Benzene	2500	2500	1	EB-L6
Benzene	5000	5000	1	EB-L7
Benzene	< 2500 U	2500	0	EB-L8
Benzene	130 J	130	1	EW-E6-a
Benzene	22	22	1	EW-E6-b
Benzene	1200	1200	1	EW-E7-a
Benzene	13 J	13	1	EW-E8-a
Benzene	< 5 U	5	0	EW-E8-b
Benzene	13 J	13	1	EW-F5
Benzene	2.8 J	2.8	1	EW-G5-a
Benzene	7.8	7.8	1	EW-G5-b
Benzene	< 10 U	10	0	EW-H4
Benzene	< 1000 U	1000	0	EW-I4-a
Benzene	< 5 U	5	0	EW-I4-b
Benzene	< 5 U	5	0	EW-J4
Benzene	< 25 U [< 25 U]	25	0	EW-K4 [DUP]
Benzene	100 J	100	1	EW-L4
Benzene	450	450	1	EW-L5-a
Benzene	60 J	60	1	EW-L5-b
Benzene	< 5 U [< 5 U]	5	0	EW-L6 [DUP]
Benzene	5.9	5.9	1	EW-L7
Benzene	< 5 U	5	0	EW-L8-a
Benzene	2900	2900	1	EW-L8-B
Benzene	< 6 U	6	0	FTASB-04
Benzene	< 6 U	6	0	FTASB-04
Benzene	< 5 U	5	0	FTASB-06
Benzene	< 6 U	6	0	FTASB-06
Benzene	< 6 U	6	0	FTASB-09
Benzene	< 6 U	6	0	FTASB-09
Benzene	18000	18000	1	FTASB-10
Benzene	87	87	1	FTASB-11
Benzene	4900	4900	1	FTASB-12
Benzene	< 6 U	6	0	FTASB-13
Benzene	< 7 U	7	0	FTASB-13
Benzene	< 6 U	6	0	FTASB-14
Benzene	64	64	1	FTASB-14
Benzene	< 5 U	5	0	FTASB-15
Benzene	< 6 U	6	0	FTASB-15
Benzene	< 5 U	5	0	FTASB-16
Benzene	< 6 U	6	0	FTASB-16
Benzene	< 5 U	5	0	FTASB-17
Benzene	< 6 U	6	0	FTASB-17
Benzene	< 5.5 U	5.5	0	HA01-MW-09
Benzene	< 5.1 U	5.1	0	HA01-MW-09
Benzene	< 8.8 U	8.8	0	HA01-MW-10
Benzene	< 6.8 U	6.8	0	HA01-MW-10
Benzene	< 6.7 U	6.7	0	HA01-MW-11
Benzene	< 5.8 U	5.8	0	HA01-MW-11
Benzene	< 5.1 U	5.1	0	HA01-MW-11 (DUP
Benzene	< 6.9 U	6.9	0	HA01-MW-12
Benzene	< 5.8 UJ	5.8	0	HA01-MW-12
Benzene	< 6.9 U	6.9	0	HA01-MW-13
Benzene	< 5.6 U	5.6	0	HA01-MW-13
Benzene	< 6.2 U	6.2	0	HA01-MW-14
Benzene	< 5.9 U	5.9	0	HA01-MW-14
Benzene	< 6.3 U	6.3	0	HA01-MW-15
Benzene	< 6.9 U	6.9	0	HA01-MW-15
Benzene	< 5.4 U	5.4	0	HA01-MW-16
Benzene	< 6.1 U	6.1	0	HA01-MW-17
Benzene	< 5.8 U	5.8	0	HA01-MW-17
Benzene	< 6 U	6	0	HMW-10
Benzene	< 6 U	6	0	HMW-10
Benzene	< 6 U	6	0	HMW-11
Benzene	13	13	1	HMW-11
Benzene	< 6 U	6	0	HMW-12
Benzene	< 6 U	6	0	HMW-12
Benzene	1900	1900	1	HMW-13

Constituent	Original Data	Result	D_Result	Location ID
Benzene	44	44	1	HMW-13
Benzene	< 1.2 U	1.2	0	HSB-1
Benzene	< 170 U	170	0	HSB-3
Benzene	< 1.3 U	1.3	0	HSB-4
Benzene	< 1800 U	1800	0	HSB-5
Benzene	< 1.3 U	1.3	0	HSB-6
Benzene	< 5.6 U	5.6	0	PSB-1
Benzene	< 30 U	30	0	PSB-1
Benzene	< 5.8 U	5.8	0	PSB-2
Benzene	< 5.8 U	5.8	0	PSB-2
Benzene	< 6 U	6	0	PSB-2
Benzene	< 6 U	6	0	PSB-2
Benzene	< 5.4 U	5.4	0	PSB-3
Benzene	< 5.7 U	5.7	0	PSB-3
Benzene	< 5.3 U	5.3	0	PSB-5
Benzene	< 5.8 U	5.8	0	PSB-5
Benzene	39	39	1	PSB-6
Benzene	< 5.7 U	5.7	0	PSB-7
Benzo(a)pyrene	< 370 U	370	0	FTASB-04
Benzo(a)pyrene	120 J	120	1	FTASB-04
Benzo(a)pyrene	240 JL	240	1	FTASB-06
Benzo(a)pyrene	< 430 U	430	0	FTASB-06
Benzo(a)pyrene	< 420 JL	420	0	FTASB-09
Benzo(a)pyrene	81 J	81	1	FTASB-09
Benzo(a)pyrene	< 1600 JL	1600	0	FTASB-10
Benzo(a)pyrene	< 400 U	400	0	FTASB-11
Benzo(a)pyrene	< 1600 JL	1600	0	FTASB-12
Benzo(a)pyrene	160 JQ	160	1	FTASB-13
Benzo(a)pyrene	< 430 U	430	0	FTASB-13
Benzo(a)pyrene	1200	1200	1	FTASB-14
Benzo(a)pyrene	160 JQ	160	1	FTASB-14
Benzo(a)pyrene	790	790	1	FTASB-15
Benzo(a)pyrene	< 390 U	390	0	FTASB-15
Benzo(a)pyrene	< 350 U	350	0	FTASB-16
Benzo(a)pyrene	< 390 U	390	0	FTASB-16
Benzo(a)pyrene	760	760	1	FTASB-17
Benzo(a)pyrene	1300	1300	1	FTASB-17
Benzo(a)pyrene	< 78 U	78	0	HA01SB001
Benzo(a)pyrene	< 71 U	71	0	HA01SB002
Benzo(a)pyrene	< 83 U	83	0	HA01SB003
Benzo(a)pyrene	300 JQ	300	1	HMW-10
Benzo(a)pyrene	< 410 U	410	0	HMW-10
Benzo(a)pyrene	5700	5700	1	HMW-11
Benzo(a)pyrene	3200	3200	1	HMW-11
Benzo(a)pyrene	910	910	1	HMW-12
Benzo(a)pyrene	1200	1200	1	HMW-12
Benzo(a)pyrene	< 400 U	400	0	HMW-13
Benzo(a)pyrene	< 380 U	380	0	HMW-13
Benzo(a)pyrene	< 360 U	360	0	HMW-14
Benzo(a)pyrene	1900	1900	1	HMW-14
Benzo(a)pyrene	< 340 U	340	0	HMW-14R
Benzo(a)pyrene	< 360 U	360	0	HMW-14R
Benzo(a)pyrene	< 380 U	380	0	HMW-15
Benzo(a)pyrene	< 360 U	360	0	HMW-15
Benzo(a)pyrene	26000	26000	1	HMW-16A
Benzo(a)pyrene	10000	10000	1	HMW-16A
Benzo(a)pyrene	< 360 U	360	0	HMW-17
Benzo(a)pyrene	< 370 U	370	0	HMW-17
Benzo(a)pyrene	< 420 U	420	0	HMW-18
Benzo(a)pyrene	< 380 U	380	0	HMW-18
Benzo(a)pyrene	< 180 U	180	0	HSB-1
Benzo(a)pyrene	< 210 U	210	0	HSB-3
Benzo(a)pyrene	< 200 U	200	0	HSB-4
Benzo(a)pyrene	< 220 U	220	0	HSB-5
Benzo(a)pyrene	< 210 U	210	0	HSB-6
Benzo(a)pyrene	320	320	1	PSB-1
Benzo(a)pyrene	< 1700 U	1700	0	PSB-1
Benzo(a)pyrene	220	220	1	PSB-2
Benzo(a)pyrene	180	180	1	PSB-2
Benzo(a)pyrene	< 170 U	170	0	PSB-2
Benzo(a)pyrene	< 170 U	170	0	PSB-2
Benzo(a)pyrene	4800	4800	1	PSB-3

Constituent	Original Data	Result	D_Result	Location ID
Benzo(a)pyrene	< 160 U	160	0	PSB-3
Benzo(a)pyrene	< 150 U	150	0	PSB-5
Benzo(a)pyrene	< 160 U	160	0	PSB-5
Benzo(a)pyrene	< 7900 U	7900	0	PSB-6
Benzo(a)pyrene	< 160 U	160	0	PSB-7
Benzo(a)pyrene	< 340 U	340	0	SB-018
Benzo(a)pyrene	< 360 U	360	0	SB-018
Benzo(a)pyrene	< 370 U	370	0	SB-019
Benzo(a)pyrene	< 370 U	370	0	SB-019
Benzo(a)pyrene	< 360 U	360	0	SB-020
Benzo(a)pyrene	< 350 U	350	0	SB-020
Benzo(a)pyrene	< 340 U	340	0	SB-021
Benzo(a)pyrene	< 390 U	390	0	SB-021
Benzo(a)pyrene	< 400 U	400	0	SB-022
Benzo(a)pyrene	< 400 U	400	0	SB-022
Benzo(a)pyrene	750	750	1	SB-023
Benzo(a)pyrene	< 410 U	410	0	SB-023
Benzo(a)pyrene	< 480 U	480	0	SB-024
Benzo(a)pyrene	< 410 U	410	0	SB-024
Benzo(a)pyrene	6200	6200	1	SB-025
Benzo(a)pyrene	< 390 U	390	0	SB-025
Benzo(a)pyrene	5200	5200	1	SB-026
Benzo(a)pyrene	< 410 U	410	0	SB-026
Benzo(a)pyrene	16000	16000	1	SB-027
Benzo(a)pyrene	< 400 U	400	0	SB-027
Benzo(a)pyrene	< 370 U	370	0	SB-028
Benzo(a)pyrene	< 380 U	380	0	SB-028
Benzo(a)pyrene	< 360 U	360	0	SB-029
Benzo(a)pyrene	< 370 U	370	0	SB-029
Benzo(a)pyrene	< 350 U	350	0	SB-030
Benzo(a)pyrene	20000	20000	1	SB-030
Benzo(a)pyrene	< 360 U	360	0	SB-035
Benzo(a)pyrene	< 350 U	350	0	SB-035
Benzo(a)pyrene	8900	8900	1	SB-036
Benzo(a)pyrene	< 390 U	390	0	SB-036
Benzo(a)pyrene	< 370 U	370	0	SB-037
Benzo(a)pyrene	< 400 U	400	0	SB-037
Benzo(a)pyrene	9900	9900	1	SB-038
Benzo(a)pyrene	< 430 U	430	0	SB-038
Benzo(a)pyrene	< 430 U	430	0	SB-041
Benzo(a)pyrene	< 350 U	350	0	SB-041
Benzo(a)pyrene	< 440 U	440	0	SB-042
Benzo(a)pyrene	< 350 U	350	0	SB-043
Benzo(a)pyrene	< 350 U	350	0	SB-043
Benzo(a)pyrene	< 350 U	350	0	SB-044
Benzo(a)pyrene	< 380 U	380	0	SB-044
Benzo(a)pyrene	< 340 UJL	340	0	SB-045
Benzo(a)pyrene	< 340 U	340	0	SB-046
Benzo(a)pyrene	< 330 UJL	330	0	SB-049
Benzo(a)pyrene	< 340 U	340	0	SB-050
Benzo(b)fluoranthene	< 370 U	370	0	FTASB-04
Benzo(b)fluoranthene	220 JL	220	1	FTASB-04
Benzo(b)fluoranthene	470 LJL	470	1	FTASB-06
Benzo(b)fluoranthene	< 430 U	430	0	FTASB-06
Benzo(b)fluoranthene	< 420 JL	420	0	FTASB-09
Benzo(b)fluoranthene	140 JL	140	1	FTASB-09
Benzo(b)fluoranthene	< 1600 JL	1600	0	FTASB-10
Benzo(b)fluoranthene	< 400 U	400	0	FTASB-11
Benzo(b)fluoranthene	< 1600 JL	1600	0	FTASB-12
Benzo(b)fluoranthene	320 JQ	320	1	FTASB-13
Benzo(b)fluoranthene	< 430 U	430	0	FTASB-13
Benzo(b)fluoranthene	2600	2600	1	FTASB-14
Benzo(b)fluoranthene	370 J	370	1	FTASB-14
Benzo(b)fluoranthene	2200	2200	1	FTASB-15
Benzo(b)fluoranthene	< 390 U	390	0	FTASB-15
Benzo(b)fluoranthene	< 350 U	350	0	FTASB-16
Benzo(b)fluoranthene	< 390 U	390	0	FTASB-16
Benzo(b)fluoranthene	2000	2000	1	FTASB-17
Benzo(b)fluoranthene	1600	1600	1	FTASB-17
Benzo(b)fluoranthene	< 78 U	78	0	HA01SB001
Benzo(b)fluoranthene	< 71 U	71	0	HA01SB002
Benzo(b)fluoranthene	< 83 U	83	0	HA01SB003

Constituent	Original Data	Result	D_Result	Location ID
Benzo(b)fluoranthene	720	720	1	HMW-10
Benzo(b)fluoranthene	< 410 U	410	0	HMW-10
Benzo(b)fluoranthene	12000	12000	1	HMW-11
Benzo(b)fluoranthene	4900	4900	1	HMW-11
Benzo(b)fluoranthene	1800	1800	1	HMW-12
Benzo(b)fluoranthene	2300	2300	1	HMW-12
Benzo(b)fluoranthene	110 JQ	110	1	HMW-13
Benzo(b)fluoranthene	< 380 U	380	0	HMW-13
Benzo(b)fluoranthene	< 360 U	360	0	HMW-14
Benzo(b)fluoranthene	1600	1600	1	HMW-14
Benzo(b)fluoranthene	< 340 U	340	0	HMW-14R
Benzo(b)fluoranthene	< 360 U	360	0	HMW-14R
Benzo(b)fluoranthene	< 380 U	380	0	HMW-15
Benzo(b)fluoranthene	< 360 U	360	0	HMW-15
Benzo(b)fluoranthene	28000	28000	1	HMW-16A
Benzo(b)fluoranthene	9100	9100	1	HMW-16A
Benzo(b)fluoranthene	< 360 U	360	0	HMW-17
Benzo(b)fluoranthene	< 370 U	370	0	HMW-17
Benzo(b)fluoranthene	< 420 U	420	0	HMW-18
Benzo(b)fluoranthene	< 380 U	380	0	HMW-18
Benzo(b)fluoranthene	< 130 U	130	0	HSB-1
Benzo(b)fluoranthene	< 150 U	150	0	HSB-3
Benzo(b)fluoranthene	< 150 U	150	0	HSB-4
Benzo(b)fluoranthene	< 160 U	160	0	HSB-5
Benzo(b)fluoranthene	< 150 U	150	0	HSB-6
Benzo(b)fluoranthene	560	560	1	PSB-1
Benzo(b)fluoranthene	< 1200 U	1200	0	PSB-1
Benzo(b)fluoranthene	370	370	1	PSB-2
Benzo(b)fluoranthene	160	160	1	PSB-2
Benzo(b)fluoranthene	< 120 U	120	0	PSB-2
Benzo(b)fluoranthene	< 120 U	120	0	PSB-2
Benzo(b)fluoranthene	6900	6900	1	PSB-3
Benzo(b)fluoranthene	< 110 U	110	0	PSB-3
Benzo(b)fluoranthene	< 110 U	110	0	PSB-5
Benzo(b)fluoranthene	< 120 U	120	0	PSB-5
Benzo(b)fluoranthene	< 5600 U	5600	0	PSB-6
Benzo(b)fluoranthene	< 110 U	110	0	PSB-7
Benzo(b)fluoranthene	< 340 U	340	0	SB-018
Benzo(b)fluoranthene	< 360 U	360	0	SB-018
Benzo(b)fluoranthene	< 370 U	370	0	SB-019
Benzo(b)fluoranthene	< 370 U	370	0	SB-019
Benzo(b)fluoranthene	< 360 U	360	0	SB-020
Benzo(b)fluoranthene	< 350 U	350	0	SB-020
Benzo(b)fluoranthene	< 340 U	340	0	SB-021
Benzo(b)fluoranthene	< 390 U	390	0	SB-021
Benzo(b)fluoranthene	< 400 U	400	0	SB-022
Benzo(b)fluoranthene	< 400 U	400	0	SB-022
Benzo(b)fluoranthene	740	740	1	SB-023
Benzo(b)fluoranthene	< 410 U	410	0	SB-023
Benzo(b)fluoranthene	< 480 U	480	0	SB-024
Benzo(b)fluoranthene	< 410 U	410	0	SB-024
Benzo(b)fluoranthene	7000	7000	1	SB-025
Benzo(b)fluoranthene	< 390 U	390	0	SB-025
Benzo(b)fluoranthene	5800	5800	1	SB-026
Benzo(b)fluoranthene	< 410 U	410	0	SB-026
Benzo(b)fluoranthene	17000	17000	1	SB-027
Benzo(b)fluoranthene	< 400 U	400	0	SB-027
Benzo(b)fluoranthene	< 370 U	370	0	SB-028
Benzo(b)fluoranthene	< 380 U	380	0	SB-028
Benzo(b)fluoranthene	< 360 U	360	0	SB-029
Benzo(b)fluoranthene	< 370 U	370	0	SB-029
Benzo(b)fluoranthene	< 350 U	350	0	SB-030
Benzo(b)fluoranthene	13000	13000	1	SB-030
Benzo(b)fluoranthene	< 360 U	360	0	SB-035
Benzo(b)fluoranthene	< 350 U	350	0	SB-035
Benzo(b)fluoranthene	8700	8700	1	SB-036
Benzo(b)fluoranthene	< 390 U	390	0	SB-036
Benzo(b)fluoranthene	< 370 U	370	0	SB-037
Benzo(b)fluoranthene	< 400 U	400	0	SB-037
Benzo(b)fluoranthene	8600	8600	1	SB-038
Benzo(b)fluoranthene	< 430 U	430	0	SB-038
Benzo(b)fluoranthene	< 430 U	430	0	SB-041

Constituent	Original Data	Result	D_Result	Location ID
Benzo(b)fluoranthene	< 350 U	350	0	SB-041
Benzo(b)fluoranthene	< 440 U	440	0	SB-042
Benzo(b)fluoranthene	< 350 U	350	0	SB-043
Benzo(b)fluoranthene	< 350 U	350	0	SB-043
Benzo(b)fluoranthene	< 350 U	350	0	SB-044
Benzo(b)fluoranthene	< 380 U	380	0	SB-044
Benzo(b)fluoranthene	< 340 UJL	340	0	SB-045
Benzo(b)fluoranthene	< 340 U	340	0	SB-046
Benzo(b)fluoranthene	< 330 UJL	330	0	SB-049
Benzo(b)fluoranthene	< 340 U	340	0	SB-050
Benzo(ghi)perylene	< 370 U	370	0	FTASB-04
Benzo(ghi)perylene	< 400 U	400	0	FTASB-04
Benzo(ghi)perylene	160 JL	160	1	FTASB-06
Benzo(ghi)perylene	< 430 U	430	0	FTASB-06
Benzo(ghi)perylene	< 420 JL	420	0	FTASB-09
Benzo(ghi)perylene	< 370 U	370	0	FTASB-09
Benzo(ghi)perylene	< 1600 JL	1600	0	FTASB-10
Benzo(ghi)perylene	< 400 U	400	0	FTASB-11
Benzo(ghi)perylene	< 1600 JL	1600	0	FTASB-12
Benzo(ghi)perylene	95 JQ	95	1	FTASB-13
Benzo(ghi)perylene	< 430 U	430	0	FTASB-13
Benzo(ghi)perylene	850	850	1	FTASB-14
Benzo(ghi)perylene	80 JQ	80	1	FTASB-14
Benzo(ghi)perylene	660	660	1	FTASB-15
Benzo(ghi)perylene	< 390 U	390	0	FTASB-15
Benzo(ghi)perylene	< 350 U	350	0	FTASB-16
Benzo(ghi)perylene	< 390 U	390	0	FTASB-16
Benzo(ghi)perylene	580	580	1	FTASB-17
Benzo(ghi)perylene	650	650	1	FTASB-17
Benzo(ghi)perylene	< 78 U	78	0	HA01SB001
Benzo(ghi)perylene	< 71 U	71	0	HA01SB002
Benzo(ghi)perylene	< 83 U	83	0	HA01SB003
Benzo(ghi)perylene	210 JQ	210	1	HMW-10
Benzo(ghi)perylene	< 410 U	410	0	HMW-10
Benzo(ghi)perylene	2000	2000	1	HMW-11
Benzo(ghi)perylene	1400	1400	1	HMW-11
Benzo(ghi)perylene	440	440	1	HMW-12
Benzo(ghi)perylene	590	590	1	HMW-12
Benzo(ghi)perylene	< 400 U	400	0	HMW-13
Benzo(ghi)perylene	< 380 U	380	0	HMW-13
Benzo(ghi)perylene	< 360 U	360	0	HMW-14
Benzo(ghi)perylene	1200	1200	1	HMW-14
Benzo(ghi)perylene	< 340 U	340	0	HMW-14R
Benzo(ghi)perylene	< 360 U	360	0	HMW-14R
Benzo(ghi)perylene	< 380 U	380	0	HMW-15
Benzo(ghi)perylene	< 360 U	360	0	HMW-15
Benzo(ghi)perylene	14000	14000	1	HMW-16A
Benzo(ghi)perylene	5700	5700	1	HMW-16A
Benzo(ghi)perylene	< 360 U	360	0	HMW-17
Benzo(ghi)perylene	< 370 U	370	0	HMW-17
Benzo(ghi)perylene	< 420 U	420	0	HMW-18
Benzo(ghi)perylene	< 380 U	380	0	HMW-18
Benzo(ghi)perylene	< 74 U	74	0	HSB-1
Benzo(ghi)perylene	< 84 U	84	0	HSB-3
Benzo(ghi)perylene	< 81 U	81	0	HSB-4
Benzo(ghi)perylene	< 89 U	89	0	HSB-5
Benzo(ghi)perylene	< 84 U	84	0	HSB-6
Benzo(ghi)perylene	< 180 U	180	0	PSB-1
Benzo(ghi)perylene	< 1900 U	1900	0	PSB-1
Benzo(ghi)perylene	< 180 U	180	0	PSB-2
Benzo(ghi)perylene	< 180 U	180	0	PSB-2
Benzo(ghi)perylene	< 190 U	190	0	PSB-2
Benzo(ghi)perylene	< 190 U	190	0	PSB-2
Benzo(ghi)perylene	< 870 U	870	0	PSB-3
Benzo(ghi)perylene	< 180 U	180	0	PSB-3
Benzo(ghi)perylene	< 170 U	170	0	PSB-5
Benzo(ghi)perylene	< 190 U	190	0	PSB-5
Benzo(ghi)perylene	< 9000 U	9000	0	PSB-6
Benzo(ghi)perylene	< 180 U	180	0	PSB-7
Benzo(ghi)perylene	< 340 U	340	0	SB-018
Benzo(ghi)perylene	< 360 U	360	0	SB-018
Benzo(ghi)perylene	< 370 U	370	0	SB-019

Constituent	Original Data	Result	D_Result	Location ID
Benzo(ghi)perylene	< 370 U	370	0	SB-019
Benzo(ghi)perylene	< 360 U	360	0	SB-020
Benzo(ghi)perylene	< 350 U	350	0	SB-020
Benzo(ghi)perylene	< 340 U	340	0	SB-021
Benzo(ghi)perylene	< 390 U	390	0	SB-021
Benzo(ghi)perylene	< 400 U	400	0	SB-022
Benzo(ghi)perylene	< 400 U	400	0	SB-022
Benzo(ghi)perylene	560	560	1	SB-023
Benzo(ghi)perylene	< 410 U	410	0	SB-023
Benzo(ghi)perylene	< 480 U	480	0	SB-024
Benzo(ghi)perylene	< 410 U	410	0	SB-024
Benzo(ghi)perylene	3800	3800	1	SB-025
Benzo(ghi)perylene	< 390 U	390	0	SB-025
Benzo(ghi)perylene	3000	3000	1	SB-026
Benzo(ghi)perylene	< 410 U	410	0	SB-026
Benzo(ghi)perylene	9500	9500	1	SB-027
Benzo(ghi)perylene	< 400 U	400	0	SB-027
Benzo(ghi)perylene	< 370 U	370	0	SB-028
Benzo(ghi)perylene	< 380 U	380	0	SB-028
Benzo(ghi)perylene	< 360 U	360	0	SB-029
Benzo(ghi)perylene	< 370 U	370	0	SB-029
Benzo(ghi)perylene	< 350 U	350	0	SB-030
Benzo(ghi)perylene	12000	12000	1	SB-030
Benzo(ghi)perylene	< 360 U	360	0	SB-035
Benzo(ghi)perylene	< 350 U	350	0	SB-035
Benzo(ghi)perylene	5700	5700	1	SB-036
Benzo(ghi)perylene	< 390 U	390	0	SB-036
Benzo(ghi)perylene	< 370 U	370	0	SB-037
Benzo(ghi)perylene	< 400 U	400	0	SB-037
Benzo(ghi)perylene	5500	5500	1	SB-038
Benzo(ghi)perylene	< 430 U	430	0	SB-038
Benzo(ghi)perylene	< 430 U	430	0	SB-041
Benzo(ghi)perylene	< 350 U	350	0	SB-041
Benzo(ghi)perylene	< 440 U	440	0	SB-042
Benzo(ghi)perylene	< 350 U	350	0	SB-043
Benzo(ghi)perylene	< 350 U	350	0	SB-043
Benzo(ghi)perylene	< 350 U	350	0	SB-044
Benzo(ghi)perylene	< 380 U	380	0	SB-044
Benzo(ghi)perylene	< 340 UJL	340	0	SB-045
Benzo(ghi)perylene	< 340 U	340	0	SB-046
Benzo(ghi)perylene	< 330 UJL	330	0	SB-049
Benzo(ghi)perylene	< 340 U	340	0	SB-050
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-04
Benzo(k)fluoranthene	< 400 U	400	0	FTASB-04
Benzo(k)fluoranthene	< 340 JL	340	0	FTASB-06
Benzo(k)fluoranthene	< 430 U	430	0	FTASB-06
Benzo(k)fluoranthene	< 420 JL	420	0	FTASB-09
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-09
Benzo(k)fluoranthene	< 1600 JL	1600	0	FTASB-10
Benzo(k)fluoranthene	< 400 U	400	0	FTASB-11
Benzo(k)fluoranthene	< 1600 JL	1600	0	FTASB-12
Benzo(k)fluoranthene	< 360 U	360	0	FTASB-13
Benzo(k)fluoranthene	< 430 U	430	0	FTASB-13
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-14
Benzo(k)fluoranthene	< 390 U	390	0	FTASB-14
Benzo(k)fluoranthene	< 360 U	360	0	FTASB-15
Benzo(k)fluoranthene	< 390 U	390	0	FTASB-15
Benzo(k)fluoranthene	< 350 U	350	0	FTASB-16
Benzo(k)fluoranthene	< 390 U	390	0	FTASB-16
Benzo(k)fluoranthene	< 350 U	350	0	FTASB-17
Benzo(k)fluoranthene	< 370 U	370	0	FTASB-17
Benzo(k)fluoranthene	< 78 U	78	0	HA01SB001
Benzo(k)fluoranthene	< 71 U	71	0	HA01SB002
Benzo(k)fluoranthene	< 83 U	83	0	HA01SB003
Benzo(k)fluoranthene	< 370 U	370	0	HMW-10
Benzo(k)fluoranthene	< 410 U	410	0	HMW-10
Benzo(k)fluoranthene	< 400 U	400	0	HMW-11
Benzo(k)fluoranthene	< 430 U	430	0	HMW-11
Benzo(k)fluoranthene	< 400 U	400	0	HMW-12
Benzo(k)fluoranthene	< 400 U	400	0	HMW-12
Benzo(k)fluoranthene	< 400 U	400	0	HMW-13
Benzo(k)fluoranthene	< 380 U	380	0	HMW-13

Constituent	Original Data	Result	D_Result	Location ID
Benzo(k)fluoranthene	< 360 U	360	0	HMW-14
Benzo(k)fluoranthene	2000	2000	1	HMW-14
Benzo(k)fluoranthene	< 340 U	340	0	HMW-14R
Benzo(k)fluoranthene	< 360 U	360	0	HMW-14R
Benzo(k)fluoranthene	< 380 U	380	0	HMW-15
Benzo(k)fluoranthene	< 360 U	360	0	HMW-15
Benzo(k)fluoranthene	27000	27000	1	HMW-16A
Benzo(k)fluoranthene	13000	13000	1	HMW-16A
Benzo(k)fluoranthene	< 360 U	360	0	HMW-17
Benzo(k)fluoranthene	< 370 U	370	0	HMW-17
Benzo(k)fluoranthene	< 420 U	420	0	HMW-18
Benzo(k)fluoranthene	< 380 U	380	0	HMW-18
Benzo(k)fluoranthene	< 170 U	170	0	HSB-1
Benzo(k)fluoranthene	< 190 U	190	0	HSB-3
Benzo(k)fluoranthene	< 180 U	180	0	HSB-4
Benzo(k)fluoranthene	< 200 U	200	0	HSB-5
Benzo(k)fluoranthene	< 190 U	190	0	HSB-6
Benzo(k)fluoranthene	250	250	1	PSB-1
Benzo(k)fluoranthene	< 1200 U	1200	0	PSB-1
Benzo(k)fluoranthene	150	150	1	PSB-2
Benzo(k)fluoranthene	< 120 U	120	0	PSB-2
Benzo(k)fluoranthene	< 120 U	120	0	PSB-2
Benzo(k)fluoranthene	2700	2700	1	PSB-3
Benzo(k)fluoranthene	< 110 U	110	0	PSB-3
Benzo(k)fluoranthene	< 110 U	110	0	PSB-5
Benzo(k)fluoranthene	< 120 U	120	0	PSB-5
Benzo(k)fluoranthene	< 5600 U	5600	0	PSB-6
Benzo(k)fluoranthene	< 110 U	110	0	PSB-7
Benzo(k)fluoranthene	< 340 U	340	0	SB-018
Benzo(k)fluoranthene	< 360 U	360	0	SB-018
Benzo(k)fluoranthene	< 370 U	370	0	SB-019
Benzo(k)fluoranthene	< 370 U	370	0	SB-019
Benzo(k)fluoranthene	< 360 U	360	0	SB-020
Benzo(k)fluoranthene	< 350 U	350	0	SB-020
Benzo(k)fluoranthene	< 340 U	340	0	SB-021
Benzo(k)fluoranthene	< 390 U	390	0	SB-021
Benzo(k)fluoranthene	< 400 U	400	0	SB-022
Benzo(k)fluoranthene	< 400 U	400	0	SB-022
Benzo(k)fluoranthene	630	630	1	SB-023
Benzo(k)fluoranthene	< 410 U	410	0	SB-023
Benzo(k)fluoranthene	< 480 U	480	0	SB-024
Benzo(k)fluoranthene	< 410 U	410	0	SB-024
Benzo(k)fluoranthene	5600	5600	1	SB-025
Benzo(k)fluoranthene	< 390 U	390	0	SB-025
Benzo(k)fluoranthene	4900	4900	1	SB-026
Benzo(k)fluoranthene	< 410 U	410	0	SB-026
Benzo(k)fluoranthene	14000	14000	1	SB-027
Benzo(k)fluoranthene	< 400 U	400	0	SB-027
Benzo(k)fluoranthene	< 370 U	370	0	SB-028
Benzo(k)fluoranthene	< 380 U	380	0	SB-028
Benzo(k)fluoranthene	< 360 U	360	0	SB-029
Benzo(k)fluoranthene	< 370 U	370	0	SB-029
Benzo(k)fluoranthene	< 350 U	350	0	SB-030
Benzo(k)fluoranthene	12000	12000	1	SB-030
Benzo(k)fluoranthene	< 360 U	360	0	SB-035
Benzo(k)fluoranthene	< 350 U	350	0	SB-035
Benzo(k)fluoranthene	8600	8600	1	SB-036
Benzo(k)fluoranthene	< 390 U	390	0	SB-036
Benzo(k)fluoranthene	< 370 U	370	0	SB-037
Benzo(k)fluoranthene	< 400 U	400	0	SB-037
Benzo(k)fluoranthene	9400	9400	1	SB-038
Benzo(k)fluoranthene	< 430 U	430	0	SB-038
Benzo(k)fluoranthene	< 430 U	430	0	SB-041
Benzo(k)fluoranthene	< 350 U	350	0	SB-041
Benzo(k)fluoranthene	< 440 U	440	0	SB-042
Benzo(k)fluoranthene	< 350 U	350	0	SB-043
Benzo(k)fluoranthene	< 350 U	350	0	SB-043
Benzo(k)fluoranthene	< 350 U	350	0	SB-044
Benzo(k)fluoranthene	< 380 U	380	0	SB-044
Benzo(k)fluoranthene	< 340 UJL	340	0	SB-045
Benzo(k)fluoranthene	< 340 U	340	0	SB-046

Constituent	Original Data	Result	D_Result	Location ID
Benzo(k)fluoranthene	< 330 UJL	330	0	SB-049
Benzo(k)fluoranthene	< 340 U	340	0	SB-050
Bis(2-ethylhexyl)phthalate	< 3 U	3	0	BH-13
Bis(2-ethylhexyl)phthalate	86 J	86	1	FTASB-04
Bis(2-ethylhexyl)phthalate	320 J	320	1	FTASB-04
Bis(2-ethylhexyl)phthalate	160 JL	160	1	FTASB-06
Bis(2-ethylhexyl)phthalate	230 J	230	1	FTASB-06
Bis(2-ethylhexyl)phthalate	230 J	230	1	FTASB-09
Bis(2-ethylhexyl)phthalate	410	410	1	FTASB-09
Bis(2-ethylhexyl)phthalate	2000 JL	2000	1	FTASB-10
Bis(2-ethylhexyl)phthalate	240 J	240	1	FTASB-11
Bis(2-ethylhexyl)phthalate	1700 JL	1700	1	FTASB-12
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	FTASB-13
Bis(2-ethylhexyl)phthalate	< 430 U	430	0	FTASB-13
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	FTASB-14
Bis(2-ethylhexyl)phthalate	98 JB	98	1	FTASB-14
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	FTASB-15
Bis(2-ethylhexyl)phthalate	< 390 U	390	0	FTASB-15
Bis(2-ethylhexyl)phthalate	< 350 U	350	0	FTASB-16
Bis(2-ethylhexyl)phthalate	90 JQ	90	1	FTASB-16
Bis(2-ethylhexyl)phthalate	160 JQ	160	1	FTASB-17
Bis(2-ethylhexyl)phthalate	100 JQ	100	1	FTASB-17
Bis(2-ethylhexyl)phthalate	< 78 U	78	0	HA01SB001
Bis(2-ethylhexyl)phthalate	540	540	1	HA01SB002
Bis(2-ethylhexyl)phthalate	< 83 U	83	0	HA01SB003
Bis(2-ethylhexyl)phthalate	140 JQ	140	1	HMW-10
Bis(2-ethylhexyl)phthalate	110 JQ	110	1	HMW-10
Bis(2-ethylhexyl)phthalate	380 JQ	380	1	HMW-11
Bis(2-ethylhexyl)phthalate	1100	1100	1	HMW-11
Bis(2-ethylhexyl)phthalate	390 J	390	1	HMW-12
Bis(2-ethylhexyl)phthalate	430	430	1	HMW-12
Bis(2-ethylhexyl)phthalate	420	420	1	HMW-13
Bis(2-ethylhexyl)phthalate	290 JQ	290	1	HMW-13
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	HMW-14
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	HMW-14
Bis(2-ethylhexyl)phthalate	< 340 U	340	0	HMW-14R
Bis(2-ethylhexyl)phthalate	430	430	1	HMW-14R
Bis(2-ethylhexyl)phthalate	< 380 U	380	0	HMW-15
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	HMW-15
Bis(2-ethylhexyl)phthalate	< 3500 U	3500	0	HMW-16A
Bis(2-ethylhexyl)phthalate	< 790 U	790	0	HMW-16A
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	HMW-17
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	HMW-17
Bis(2-ethylhexyl)phthalate	< 420 U	420	0	HMW-18
Bis(2-ethylhexyl)phthalate	< 380 U	380	0	HMW-18
Bis(2-ethylhexyl)phthalate	< 340 U	340	0	SB-018
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	SB-018
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	SB-019
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	SB-019
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	SB-020
Bis(2-ethylhexyl)phthalate	< 350 U	350	0	SB-020
Bis(2-ethylhexyl)phthalate	< 340 U	340	0	SB-021
Bis(2-ethylhexyl)phthalate	< 390 U	390	0	SB-021
Bis(2-ethylhexyl)phthalate	< 400 U	400	0	SB-022
Bis(2-ethylhexyl)phthalate	< 400 U	400	0	SB-022
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	SB-023
Bis(2-ethylhexyl)phthalate	< 410 U	410	0	SB-023
Bis(2-ethylhexyl)phthalate	< 480 U	480	0	SB-024
Bis(2-ethylhexyl)phthalate	< 410 U	410	0	SB-024
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	SB-025
Bis(2-ethylhexyl)phthalate	< 390 U	390	0	SB-025
Bis(2-ethylhexyl)phthalate	< 410 U	410	0	SB-026
Bis(2-ethylhexyl)phthalate	< 410 U	410	0	SB-026
Bis(2-ethylhexyl)phthalate	< 1400 U	1400	0	SB-027
Bis(2-ethylhexyl)phthalate	< 400 U	400	0	SB-027
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	SB-028
Bis(2-ethylhexyl)phthalate	< 380 U	380	0	SB-028
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	SB-029
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	SB-029
Bis(2-ethylhexyl)phthalate	< 350 U	350	0	SB-030
Bis(2-ethylhexyl)phthalate	< 1900 U	1900	0	SB-030
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	SB-035

Constituent	Original Data	Result	D_Result	Location ID
Bis(2-ethylhexyl)phthalate	< 350 U	350	0	SB-035
Bis(2-ethylhexyl)phthalate	< 360 U	360	0	SB-036
Bis(2-ethylhexyl)phthalate	< 390 U	390	0	SB-036
Bis(2-ethylhexyl)phthalate	< 370 U	370	0	SB-037
Bis(2-ethylhexyl)phthalate	< 400 U	400	0	SB-037
Bis(2-ethylhexyl)phthalate	< 380 U	380	0	SB-038
Bis(2-ethylhexyl)phthalate	< 430 U	430	0	SB-038
Bis(2-ethylhexyl)phthalate	< 430 U	430	0	SB-041
Bis(2-ethylhexyl)phthalate	< 350 UJ	350	0	SB-041
Bis(2-ethylhexyl)phthalate	< 440 U	440	0	SB-042
Bis(2-ethylhexyl)phthalate	< 350 UJ	350	0	SB-043
Bis(2-ethylhexyl)phthalate	< 350 UJ	350	0	SB-043
Bis(2-ethylhexyl)phthalate	< 350 UJ	350	0	SB-044
Bis(2-ethylhexyl)phthalate	< 380 UJ	380	0	SB-044
Bis(2-ethylhexyl)phthalate	< 340 UJL	340	0	SB-045
Bis(2-ethylhexyl)phthalate	< 340 UJ	340	0	SB-046
Bis(2-ethylhexyl)phthalate	< 330 UJL	330	0	SB-049
Bis(2-ethylhexyl)phthalate	< 340 U	340	0	SB-050
Chromium	0.00284	0.00284	1	BH-13
Chromium	5800	5800	1	EB-K5
Chromium	9400	9400	1	EW-I4-b
Chromium	3000	3000	1	FTASB-04
Chromium	2400 J	2400	1	FTASB-04
Chromium	5100	5100	1	FTASB-06
Chromium	2200 J	2200	1	FTASB-06
Chromium	2400	2400	1	FTASB-09
Chromium	5500	5500	1	FTASB-09
Chromium	2100 J	2100	1	FTASB-10
Chromium	2700 J	2700	1	FTASB-11
Chromium	2500 J	2500	1	FTASB-12
Chromium	5700	5700	1	FTASB-13
Chromium	4400 J	4400	1	FTASB-13
Chromium	4400	4400	1	FTASB-14
Chromium	4700	4700	1	FTASB-14
Chromium	4100	4100	1	FTASB-15
Chromium	2600 JQ	2600	1	FTASB-15
Chromium	3400	3400	1	FTASB-16
Chromium	3700 JQ	3700	1	FTASB-16
Chromium	4700	4700	1	FTASB-17
Chromium	2100 JQ	2100	1	FTASB-17
Chromium	4000	4000	1	HA01-MW-09
Chromium	4000	4000	1	HA01-MW-09
Chromium	2000	2000	1	HA01-MW-10
Chromium	2300	2300	1	HA01-MW-10
Chromium	3200	3200	1	HA01-MW-11
Chromium	6000	6000	1	HA01-MW-11
Chromium	6100	6100	1	HA01-MW-11 (DUP
Chromium	1700	1700	1	HA01-MW-12
Chromium	2200	2200	1	HA01-MW-12
Chromium	910	910	1	HA01-MW-13
Chromium	9900	9900	1	HA01-MW-13
Chromium	8600	8600	1	HA01-MW-14
Chromium	1400	1400	1	HA01-MW-14
Chromium	6800	6800	1	HA01-MW-15
Chromium	1000	1000	1	HA01-MW-15
Chromium	3000	3000	1	HA01-MW-16
Chromium	1800	1800	1	HA01-MW-17
Chromium	9300	9300	1	HA01-MW-17
Chromium	6900	6900	1	HA01SB001
Chromium	4200	4200	1	HA01SB001
Chromium	4900	4900	1	HA01SB004
Chromium	2600	2600	1	HA01SB005
Chromium	7700	7700	1	HMW-10
Chromium	3300 JQ	3300	1	HMW-10
Chromium	8100	8100	1	HMW-11
Chromium	7500	7500	1	HMW-11
Chromium	3600 JQ	3600	1	HMW-12
Chromium	4600 J	4600	1	HMW-12
Chromium	3000 JQ	3000	1	HMW-13
Chromium	31700	31700	1	HMW-13
Chromium	780	780	1	HSB-1
Chromium	3850	3850	1	HSB-3

Constituent	Original Data	Result	D_Result	Location ID
Chromium	5870	5870	1	HSB-4
Chromium	1930	1930	1	HSB-5
Chromium	2390	2390	1	HSB-6
Chromium	5610	5610	1	PSB-1
Chromium	2810	2810	1	PSB-1
Chromium	5880	5880	1	PSB-2
Chromium	6640	6640	1	PSB-2
Chromium	5510	5510	1	PSB-2
Chromium	6030	6030	1	PSB-2
Chromium	3550	3550	1	PSB-3
Chromium	2160	2160	1	PSB-3
Chromium	3680	3680	1	PSB-5
Chromium	3980	3980	1	PSB-5
Chromium	1940	1940	1	PSB-6
Chromium	2860	2860	1	PSB-7
Chromium	2400	2400	1	SB-043
Chromium	2600	2600	1	SB-043
Chromium	2700	2700	1	SB-044
Chromium	4300	4300	1	SB-044
Chromium	1900	1900	1	SB-046
Chromium	3900	3900	1	SB-048
Chrysene	< 370 U	370	0	FTASB-04
Chrysene	120 J	120	1	FTASB-04
Chrysene	260 J	260	1	FTASB-06
Chrysene	< 430 U	430	0	FTASB-06
Chrysene	< 420 U	420	0	FTASB-09
Chrysene	55 J	55	1	FTASB-09
Chrysene	< 1600 JL	1600	0	FTASB-10
Chrysene	< 400 U	400	0	FTASB-11
Chrysene	400 JL	400	1	FTASB-12
Chrysene	200 JQ	200	1	FTASB-13
Chrysene	110 JQ	110	1	FTASB-13
Chrysene	1000	1000	1	FTASB-14
Chrysene	200 JQ	200	1	FTASB-14
Chrysene	750	750	1	FTASB-15
Chrysene	< 390 U	390	0	FTASB-15
Chrysene	< 350 U	350	0	FTASB-16
Chrysene	< 390 U	390	0	FTASB-16
Chrysene	710	710	1	FTASB-17
Chrysene	1800	1800	1	FTASB-17
Chrysene	< 78 U	78	0	HA01SB001
Chrysene	< 71 U	71	0	HA01SB002
Chrysene	< 83 U	83	0	HA01SB003
Chrysene	390	390	1	HMW-10
Chrysene	< 410 U	410	0	HMW-10
Chrysene	6300	6300	1	HMW-11
Chrysene	4000	4000	1	HMW-11
Chrysene	830	830	1	HMW-12
Chrysene	1100	1100	1	HMW-12
Chrysene	72 JQ	72	1	HMW-13
Chrysene	< 380 U	380	0	HMW-13
Chrysene	< 360 U	360	0	HMW-14
Chrysene	1900	1900	1	HMW-14
Chrysene	< 340 U	340	0	HMW-14R
Chrysene	< 360 U	360	0	HMW-14R
Chrysene	< 380 U	380	0	HMW-15
Chrysene	< 360 U	360	0	HMW-15
Chrysene	33000	33000	1	HMW-16A
Chrysene	12000	12000	1	HMW-16A
Chrysene	< 360 U	360	0	HMW-17
Chrysene	< 370 U	370	0	HMW-17
Chrysene	< 420 U	420	0	HMW-18
Chrysene	< 380 U	380	0	HMW-18
Chrysene	< 97 U	97	0	HSB-1
Chrysene	< 110 U	110	0	HSB-3
Chrysene	< 110 U	110	0	HSB-4
Chrysene	< 120 U	120	0	HSB-5
Chrysene	< 110 U	110	0	HSB-6
Chrysene	560	560	1	PSB-1
Chrysene	< 1200 U	1200	0	PSB-1
Chrysene	200	200	1	PSB-2
Chrysene	130	130	1	PSB-2

Constituent	Original Data	Result	D_Result	Location ID
Chrysene	< 120 U	120	0	PSB-2
Chrysene	< 120 U	120	0	PSB-2
Chrysene	5300	5300	1	PSB-3
Chrysene	< 110 U	110	0	PSB-3
Chrysene	< 110 U	110	0	PSB-5
Chrysene	< 120 U	120	0	PSB-5
Chrysene	< 5600 U	5600	0	PSB-6
Chrysene	< 110 U	110	0	PSB-7
Chrysene	< 340 U	340	0	SB-018
Chrysene	< 360 U	360	0	SB-018
Chrysene	< 370 U	370	0	SB-019
Chrysene	< 370 U	370	0	SB-019
Chrysene	< 360 U	360	0	SB-020
Chrysene	< 350 U	350	0	SB-020
Chrysene	< 340 U	340	0	SB-021
Chrysene	< 390 U	390	0	SB-021
Chrysene	< 400 U	400	0	SB-022
Chrysene	< 400 U	400	0	SB-022
Chrysene	560	560	1	SB-023
Chrysene	< 410 U	410	0	SB-023
Chrysene	< 480 U	480	0	SB-024
Chrysene	< 410 U	410	0	SB-024
Chrysene	7200	7200	1	SB-025
Chrysene	< 390 U	390	0	SB-025
Chrysene	6400	6400	1	SB-026
Chrysene	< 410 U	410	0	SB-026
Chrysene	16000	16000	1	SB-027
Chrysene	< 400 U	400	0	SB-027
Chrysene	< 370 U	370	0	SB-028
Chrysene	< 380 U	380	0	SB-028
Chrysene	< 360 U	360	0	SB-029
Chrysene	< 370 U	370	0	SB-029
Chrysene	< 350 U	350	0	SB-030
Chrysene	20000	20000	1	SB-030
Chrysene	< 360 U	360	0	SB-035
Chrysene	< 350 U	350	0	SB-035
Chrysene	8900	8900	1	SB-036
Chrysene	< 390 U	390	0	SB-036
Chrysene	< 370 U	370	0	SB-037
Chrysene	< 400 U	400	0	SB-037
Chrysene	14000	14000	1	SB-038
Chrysene	< 430 U	430	0	SB-038
Chrysene	< 430 U	430	0	SB-041
Chrysene	< 350 U	350	0	SB-041
Chrysene	< 440 U	440	0	SB-042
Chrysene	< 350 U	350	0	SB-043
Chrysene	< 350 U	350	0	SB-043
Chrysene	< 350 U	350	0	SB-044
Chrysene	< 380 U	380	0	SB-044
Chrysene	< 340 UJL	340	0	SB-045
Chrysene	< 340 U	340	0	SB-046
Chrysene	< 330 UJL	330	0	SB-049
Chrysene	< 340 U	340	0	SB-050
DDD	6.3	6.3	1	EB-J4
DDD	9	9	1	EB-J5
DDD	8.5	8.5	1	EB-K5
DDD	15	15	1	EB-L5
DDD	7.6	7.6	1	EW-H4
DDD	4.3	4.3	1	EW-I4-a
DDD	8.5	8.5	1	EW-I4-b
DDD	11	11	1	EW-J4
DDD	3.5 [4.2]	4.2	1	EW-K4 [DUP]
DDD	12	12	1	EW-L4
DDD	6.2	6.2	1	EW-L5-a
DDD	< 1.8 U	1.8	0	HA01-MW-09
DDD	< 2 U	2	0	HA01-MW-10
DDD	< 2 U	2	0	HA01-MW-11
DDD	< 1.9 U	1.9	0	HA01-MW-12
DDD	< 1.8 U	1.8	0	HA01-MW-13
DDD	< 1.8 U	1.8	0	HA01-MW-14
DDD	< 1.9 U	1.9	0	HA01-MW-15
DDD	< 1.8 U	1.8	0	HA01-MW-16

Constituent	Original Data	Result	D_Result	Location ID
DDD	< 1.9 U	1.9	0	HA01-MW-17
DDE, p,p'-	15	15	1	EB-J5
DDE, p,p'-	4.5	4.5	1	EB-K4
DDE, p,p'-	19	19	1	EB-K5
DDE, p,p'-	24	24	1	EB-L5
DDE, p,p'-	7.5	7.5	1	EW-H4
DDE, p,p'-	3.2	3.2	1	EW-I4-a
DDE, p,p'-	6.4	6.4	1	EW-I4-b
DDE, p,p'-	4.3	4.3	1	EW-J4
DDE, p,p'-	12	12	1	EW-L4
DDE, p,p'-	9.5	9.5	1	EW-L5-a
DDE, p,p'-	< 1.8 U	1.8	0	HA01-MW-09
DDE, p,p'-	< 2 U	2	0	HA01-MW-10
DDE, p,p'-	< 2 U	2	0	HA01-MW-11
DDE, p,p'-	< 1.9 U	1.9	0	HA01-MW-12
DDE, p,p'-	< 1.8 U	1.8	0	HA01-MW-13
DDE, p,p'-	< 1.8 U	1.8	0	HA01-MW-14
DDE, p,p'-	< 1.9 U	1.9	0	HA01-MW-15
DDE, p,p'-	< 1.8 U	1.8	0	HA01-MW-16
DDE, p,p'-	< 1.9 U	1.9	0	HA01-MW-17
Dibenz(a,h)anthracene	< 370 U	370	0	FTASB-04
Dibenz(a,h)anthracene	< 400 U	400	0	FTASB-04
Dibenz(a,h)anthracene	< 340 JL	340	0	FTASB-06
Dibenz(a,h)anthracene	< 430 U	430	0	FTASB-06
Dibenz(a,h)anthracene	< 420 JL	420	0	FTASB-09
Dibenz(a,h)anthracene	< 370 U	370	0	FTASB-09
Dibenz(a,h)anthracene	< 1600 JL	1600	0	FTASB-10
Dibenz(a,h)anthracene	< 400 U	400	0	FTASB-11
Dibenz(a,h)anthracene	< 1600 U	1600	0	FTASB-12
Dibenz(a,h)anthracene	< 360 U	360	0	FTASB-13
Dibenz(a,h)anthracene	< 430 U	430	0	FTASB-13
Dibenz(a,h)anthracene	< 370 U	370	0	FTASB-14
Dibenz(a,h)anthracene	< 390 U	390	0	FTASB-14
Dibenz(a,h)anthracene	200 JQ	200	1	FTASB-15
Dibenz(a,h)anthracene	< 390 U	390	0	FTASB-15
Dibenz(a,h)anthracene	< 350 U	350	0	FTASB-16
Dibenz(a,h)anthracene	< 390 U	390	0	FTASB-16
Dibenz(a,h)anthracene	91 JQ	91	1	FTASB-17
Dibenz(a,h)anthracene	240 JQ	240	1	FTASB-17
Dibenz(a,h)anthracene	< 78 U	78	0	HA01SB001
Dibenz(a,h)anthracene	< 71 U	71	0	HA01SB002
Dibenz(a,h)anthracene	< 83 U	83	0	HA01SB003
Dibenz(a,h)anthracene	< 370 U	370	0	HMW-10
Dibenz(a,h)anthracene	< 410 U	410	0	HMW-10
Dibenz(a,h)anthracene	< 400 U	400	0	HMW-11
Dibenz(a,h)anthracene	< 430 U	430	0	HMW-11
Dibenz(a,h)anthracene	160 JQ	160	1	HMW-12
Dibenz(a,h)anthracene	< 400 U	400	0	HMW-12
Dibenz(a,h)anthracene	< 400 U	400	0	HMW-13
Dibenz(a,h)anthracene	< 380 U	380	0	HMW-13
Dibenz(a,h)anthracene	< 360 U	360	0	HMW-14
Dibenz(a,h)anthracene	430	430	1	HMW-14
Dibenz(a,h)anthracene	< 340 U	340	0	HMW-14R
Dibenz(a,h)anthracene	< 360 U	360	0	HMW-14R
Dibenz(a,h)anthracene	< 380 U	380	0	HMW-15
Dibenz(a,h)anthracene	< 360 U	360	0	HMW-15
Dibenz(a,h)anthracene	< 3500 U	3500	0	HMW-16A
Dibenz(a,h)anthracene	860	860	1	HMW-16A
Dibenz(a,h)anthracene	< 360 U	360	0	HMW-17
Dibenz(a,h)anthracene	< 370 U	370	0	HMW-17
Dibenz(a,h)anthracene	< 420 U	420	0	HMW-18
Dibenz(a,h)anthracene	< 380 U	380	0	HMW-18
Dibenz(a,h)anthracene	< 63 U	63	0	HSB-1
Dibenz(a,h)anthracene	< 72 U	72	0	HSB-3
Dibenz(a,h)anthracene	< 70 U	70	0	HSB-4
Dibenz(a,h)anthracene	< 77 U	77	0	HSB-5
Dibenz(a,h)anthracene	< 72 U	72	0	HSB-6
Dibenz(a,h)anthracene	< 180 U	180	0	PSB-1
Dibenz(a,h)anthracene	< 1900 U	1900	0	PSB-1
Dibenz(a,h)anthracene	< 180 U	180	0	PSB-2
Dibenz(a,h)anthracene	< 160 U	160	0	PSB-2
Dibenz(a,h)anthracene	< 190 U	190	0	PSB-2

Constituent	Original Data	Result	D_Result	Location ID
Dibenz(a,h)anthracene	< 190 U	190	0	PSB-2
Dibenz(a,h)anthracene	< 870 U	870	0	PSB-3
Dibenz(a,h)anthracene	< 180 U	180	0	PSB-3
Dibenz(a,h)anthracene	< 170 U	170	0	PSB-5
Dibenz(a,h)anthracene	< 190 U	190	0	PSB-5
Dibenz(a,h)anthracene	< 9000 U	9000	0	PSB-6
Dibenz(a,h)anthracene	< 180 U	180	0	PSB-7
Dibenz(a,h)anthracene	< 340 U	340	0	SB-018
Dibenz(a,h)anthracene	< 360 U	360	0	SB-018
Dibenz(a,h)anthracene	< 370 U	370	0	SB-019
Dibenz(a,h)anthracene	< 370 U	370	0	SB-019
Dibenz(a,h)anthracene	< 360 U	360	0	SB-020
Dibenz(a,h)anthracene	< 350 U	350	0	SB-020
Dibenz(a,h)anthracene	< 340 U	340	0	SB-021
Dibenz(a,h)anthracene	< 390 U	390	0	SB-021
Dibenz(a,h)anthracene	< 400 U	400	0	SB-022
Dibenz(a,h)anthracene	< 400 U	400	0	SB-022
Dibenz(a,h)anthracene	< 360 U	360	0	SB-023
Dibenz(a,h)anthracene	< 410 U	410	0	SB-023
Dibenz(a,h)anthracene	< 480 U	480	0	SB-024
Dibenz(a,h)anthracene	< 410 U	410	0	SB-024
Dibenz(a,h)anthracene	1800	1800	1	SB-025
Dibenz(a,h)anthracene	< 390 U	390	0	SB-025
Dibenz(a,h)anthracene	470	470	1	SB-026
Dibenz(a,h)anthracene	< 410 U	410	0	SB-026
Dibenz(a,h)anthracene	3900	3900	1	SB-027
Dibenz(a,h)anthracene	< 400 U	400	0	SB-027
Dibenz(a,h)anthracene	< 370 U	370	0	SB-028
Dibenz(a,h)anthracene	< 380 U	380	0	SB-028
Dibenz(a,h)anthracene	< 360 U	360	0	SB-029
Dibenz(a,h)anthracene	< 370 U	370	0	SB-029
Dibenz(a,h)anthracene	< 350 U	350	0	SB-030
Dibenz(a,h)anthracene	4200	4200	1	SB-030
Dibenz(a,h)anthracene	< 360 U	360	0	SB-035
Dibenz(a,h)anthracene	< 350 U	350	0	SB-035
Dibenz(a,h)anthracene	< 360 U	360	0	SB-036
Dibenz(a,h)anthracene	< 390 U	390	0	SB-036
Dibenz(a,h)anthracene	< 370 U	370	0	SB-037
Dibenz(a,h)anthracene	< 400 U	400	0	SB-037
Dibenz(a,h)anthracene	3100	3100	1	SB-038
Dibenz(a,h)anthracene	< 430 U	430	0	SB-038
Dibenz(a,h)anthracene	< 430 U	430	0	SB-041
Dibenz(a,h)anthracene	< 350 U	350	0	SB-041
Dibenz(a,h)anthracene	< 440 U	440	0	SB-042
Dibenz(a,h)anthracene	< 350 U	350	0	SB-043
Dibenz(a,h)anthracene	< 350 U	350	0	SB-043
Dibenz(a,h)anthracene	< 350 U	350	0	SB-044
Dibenz(a,h)anthracene	< 380 U	380	0	SB-044
Dibenz(a,h)anthracene	< 340 UJL	340	0	SB-045
Dibenz(a,h)anthracene	< 340 U	340	0	SB-046
Dibenz(a,h)anthracene	< 330 UJL	330	0	SB-049
Dibenz(a,h)anthracene	< 340 U	340	0	SB-050
Dibenzofuran	< 370 U	370	0	FTASB-04
Dibenzofuran	< 400 U	400	0	FTASB-04
Dibenzofuran	< 340 U	340	0	FTASB-06
Dibenzofuran	< 430 U	430	0	FTASB-06
Dibenzofuran	< 420 U	420	0	FTASB-09
Dibenzofuran	< 370 U	370	0	FTASB-09
Dibenzofuran	2300 JL	2300	1	FTASB-10
Dibenzofuran	150 J	150	1	FTASB-11
Dibenzofuran	950 J	950	1	FTASB-12
Dibenzofuran	< 360 U	360	0	FTASB-13
Dibenzofuran	< 430 U	430	0	FTASB-13
Dibenzofuran	< 370 U	370	0	FTASB-14
Dibenzofuran	660	660	1	FTASB-14
Dibenzofuran	< 360 U	360	0	FTASB-15
Dibenzofuran	< 390 U	390	0	FTASB-15
Dibenzofuran	< 350 U	350	0	FTASB-16
Dibenzofuran	< 390 U	390	0	FTASB-16
Dibenzofuran	< 350 U	350	0	FTASB-17
Dibenzofuran	< 370 U	370	0	FTASB-17
Dibenzofuran	< 78 U	78	0	HA01SB001

Constituent	Original Data	Result	D_Result	Location ID
Dibenzofuran	< 71 U	71	0	HA01SB002
Dibenzofuran	< 83 U	83	0	HA01SB003
Dibenzofuran	< 370 U	370	0	HMW-10
Dibenzofuran	< 410 U	410	0	HMW-10
Dibenzofuran	240 JQ	240	1	HMW-11
Dibenzofuran	82 JQ	82	1	HMW-11
Dibenzofuran	< 400 U	400	0	HMW-12
Dibenzofuran	< 400 U	400	0	HMW-12
Dibenzofuran	660	660	1	HMW-13
Dibenzofuran	< 380 U	380	0	HMW-13
Ethylbenzene	7700	7700	1	EB-E7 [Dpu]
Ethylbenzene	3300	3300	1	EB-E8
Ethylbenzene	570	570	1	EB-F6
Ethylbenzene	20000	20000	1	EB-F7
Ethylbenzene	18000	18000	1	EB-F8
Ethylbenzene	6700	6700	1	EB-G6
Ethylbenzene	1300	1300	1	EB-G7
Ethylbenzene	10000 [6000]	10000	1	EB-G8 [DUP]
Ethylbenzene	19000	19000	1	EB-H5
Ethylbenzene	12000	12000	1	EB-H6
Ethylbenzene	9000	9000	1	EB-H7
Ethylbenzene	9000	9000	1	EB-H8
Ethylbenzene	13000	13000	1	EB-I7
Ethylbenzene	5100	5100	1	EB-I8
Ethylbenzene	32000 [--]	32000	1	EB-J6 [DUP]
Ethylbenzene	26000	26000	1	EB-J7
Ethylbenzene	13000	13000	1	EB-J8
Ethylbenzene	13000	13000	1	EB-K4
Ethylbenzene	13000	13000	1	EB-K6
Ethylbenzene	47000	47000	1	EB-K7
Ethylbenzene	12000	12000	1	EB-K8
Ethylbenzene	9400	9400	1	EB-L5
Ethylbenzene	23000	23000	1	EB-L6
Ethylbenzene	37000	37000	1	EB-L7
Ethylbenzene	11000	11000	1	EB-L8
Ethylbenzene	8000	8000	1	EW-E6-a
Ethylbenzene	410	410	1	EW-E6-b
Ethylbenzene	47000	47000	1	EW-E7-a
Ethylbenzene	31	31	1	EW-E8-a
Ethylbenzene	11	11	1	EW-G5-a
Ethylbenzene	21	21	1	EW-G5-b
Ethylbenzene	1500	1500	1	EW-L5-a
Ethylbenzene	23000	23000	1	EW-L8-B
Ethylbenzene	< 6 U	6	0	FTASB-04
Ethylbenzene	< 6 U	6	0	FTASB-04
Ethylbenzene	< 5 U	5	0	FTASB-06
Ethylbenzene	< 6 U	6	0	FTASB-06
Ethylbenzene	< 6 U	6	0	FTASB-09
Ethylbenzene	120000	120000	1	FTASB-10
Ethylbenzene	4000	4000	1	FTASB-11
Ethylbenzene	61000	61000	1	FTASB-12
Ethylbenzene	< 6 U	6	0	FTASB-13
Ethylbenzene	< 7 U	7	0	FTASB-13
Ethylbenzene	< 6 U	6	0	FTASB-14
Ethylbenzene	2400	2400	1	FTASB-14
Ethylbenzene	< 5 U	5	0	FTASB-15
Ethylbenzene	< 6 U	6	0	FTASB-15
Ethylbenzene	< 5 U	5	0	FTASB-16
Ethylbenzene	< 6 U	6	0	FTASB-16
Ethylbenzene	< 5 U	5	0	FTASB-17
Ethylbenzene	< 6 U	6	0	FTASB-17
Ethylbenzene	< 5.5 U	5.5	0	HA01-MW-09
Ethylbenzene	< 5.1 U	5.1	0	HA01-MW-09
Ethylbenzene	< 8.8 U	8.8	0	HA01-MW-10
Ethylbenzene	< 6.8 U	6.8	0	HA01-MW-10
Ethylbenzene	< 6.7 U	6.7	0	HA01-MW-11
Ethylbenzene	< 5.8 U	5.8	0	HA01-MW-11
Ethylbenzene	< 5.1 U	5.1	0	HA01-MW-11 (DUP
Ethylbenzene	< 6.9 U	6.9	0	HA01-MW-12
Ethylbenzene	< 5.8 U	5.8	0	HA01-MW-12
Ethylbenzene	< 6.9 U	6.9	0	HA01-MW-13

Constituent	Original Data	Result	D_Result	Location ID
Ethylbenzene	< 5.6 U	5.6	0	HA01-MW-13
Ethylbenzene	< 6.2 U	6.2	0	HA01-MW-14
Ethylbenzene	< 5.9 U	5.9	0	HA01-MW-14
Ethylbenzene	< 6.3 U	6.3	0	HA01-MW-15
Ethylbenzene	< 6.9 U	6.9	0	HA01-MW-15
Ethylbenzene	< 5.4 U	5.4	0	HA01-MW-16
Ethylbenzene	< 6.1 U	6.1	0	HA01-MW-17
Ethylbenzene	< 5.8 U	5.8	0	HA01-MW-17
Ethylbenzene	< 6 U	6	0	HMW-10
Ethylbenzene	< 6 U	6	0	HMW-10
Ethylbenzene	< 6 U	6	0	HMW-11
Ethylbenzene	35	35	1	HMW-11
Ethylbenzene	< 6 U	6	0	HMW-12
Ethylbenzene	< 6 U	6	0	HMW-12
Ethylbenzene	65000	65000	1	HMW-13
Ethylbenzene	540	540	1	HMW-13
Ethylbenzene	< 5.7 U	5.7	0	HMW-14
Ethylbenzene	< 6 U	6	0	HMW-14
Ethylbenzene	< 5.2 U	5.2	0	HMW-14R
Ethylbenzene	< 5.4 U	5.4	0	HMW-14R
Ethylbenzene	< 7 U	7	0	HMW-15
Ethylbenzene	< 6.2 U	6.2	0	HMW-15
Ethylbenzene	< 6.2 U	6.2	0	HMW-16A
Ethylbenzene	< 6.5 U	6.5	0	HMW-16A
Ethylbenzene	< 6 U	6	0	HMW-17
Ethylbenzene	< 6.3 U	6.3	0	HMW-17
Ethylbenzene	< 6.4 U	6.4	0	HMW-18
Ethylbenzene	< 5.8 U	5.8	0	HMW-18
Ethylbenzene	< 1.1 U	1.1	0	HSB-1
Ethylbenzene	1500	1500	1	HSB-3
Ethylbenzene	< 1.2 U	1.2	0	HSB-4
Ethylbenzene	10000	10000	1	HSB-5
Ethylbenzene	< 1.2 U	1.2	0	HSB-6
Ethylbenzene	< 5.6 U	5.6	0	PSB-1
Ethylbenzene	36	36	1	PSB-1
Ethylbenzene	< 5.8 U	5.8	0	PSB-2
Ethylbenzene	< 5.8 U	5.8	0	PSB-2
Ethylbenzene	< 6 U	6	0	PSB-2
Ethylbenzene	< 6 U	6	0	PSB-2
Ethylbenzene	< 5.4 U	5.4	0	PSB-3
Ethylbenzene	< 5.7 U	5.7	0	PSB-3
Ethylbenzene	< 5.3 U	5.3	0	PSB-5
Ethylbenzene	< 5.8 U	5.8	0	PSB-5
Ethylbenzene	540	540	1	PSB-6
Ethylbenzene	< 5.7 U	5.7	0	PSB-7
Ethylbenzene	< 5.6 U	5.6	0	SB-018
Ethylbenzene	< 5.8 U	5.8	0	SB-018
Ethylbenzene	< 6.4 U	6.4	0	SB-019
Ethylbenzene	< 6.4 U	6.4	0	SB-019
Ethylbenzene	< 6.2 U	6.2	0	SB-020
Ethylbenzene	< 6.2 U	6.2	0	SB-020
Ethylbenzene	< 6.4 U	6.4	0	SB-021
Ethylbenzene	< 6.7 U	6.7	0	SB-021
Ethylbenzene	< 6.6 U	6.6	0	SB-022
Ethylbenzene	< 5.4 U	5.4	0	SB-022
Ethylbenzene	< 6.4 U	6.4	0	SB-023
Ethylbenzene	< 7.5 U	7.5	0	SB-023
Ethylbenzene	< 11 U	11	0	SB-024
Ethylbenzene	< 8.7 U	8.7	0	SB-024
Ethylbenzene	< 5.6 U	5.6	0	SB-025
Ethylbenzene	< 6 U	6	0	SB-025
Ethylbenzene	< 6.9 U	6.9	0	SB-026
Ethylbenzene	< 6.5 U	6.5	0	SB-026
Ethylbenzene	< 6.5 U	6.5	0	SB-027
Ethylbenzene	20	20	1	SB-027
Ethylbenzene	< 6.7 U	6.7	0	SB-028
Ethylbenzene	< 6.1 U	6.1	0	SB-028
Ethylbenzene	< 6.4 U	6.4	0	SB-029
Ethylbenzene	< 6.2 U	6.2	0	SB-029
Ethylbenzene	< 53 U	53	0	SB-030
Ethylbenzene	< 55 U	55	0	SB-030
Ethylbenzene	< 53 U	53	0	SB-031

Constituent	Original Data	Result	D_Result	Location ID
Ethylbenzene	< 5.3 U	5.3	0	SB-031
Ethylbenzene	< 5.3 U	5.3	0	SB-033
Ethylbenzene	< 5.3 U	5.3	0	SB-033
Ethylbenzene	< 5.4 U	5.4	0	SB-034
Ethylbenzene	< 5.6 U	5.6	0	SB-034
Ethylbenzene	< 5.5 U	5.5	0	SB-035
Ethylbenzene	< 5.2 U	5.2	0	SB-035
Ethylbenzene	< 5.5 U	5.5	0	SB-036
Ethylbenzene	< 6 U	6	0	SB-036
Ethylbenzene	< 5.6 U	5.6	0	SB-037
Ethylbenzene	< 6.1 U	6.1	0	SB-037
Ethylbenzene	< 5.7 U	5.7	0	SB-038
Ethylbenzene	< 6.6 UJ	6.6	0	SB-038
Ethylbenzene	< 5.9 U	5.9	0	SB-039
Ethylbenzene	< 30 U	30	0	SB-039
Ethylbenzene	< 5.7 U	5.7	0	SB-040
Ethylbenzene	< 6.3 U	6.3	0	SB-040
Ethylbenzene	< 6 U	6	0	SB-041
Ethylbenzene	< 5.8 U	5.8	0	SB-043
Ethylbenzene	< 6 U	6	0	SB-043A
Ethylbenzene	< 5.8 U	5.8	0	SB-044
Ethylbenzene	< 5.9 U	5.9	0	SB-044
Ethylbenzene	< 6 U	6	0	SB-046
Fluoranthene	< 370 U	370	0	FTASB-04
Fluoranthene	240 J	240	1	FTASB-04
Fluoranthene	360	360	1	FTASB-06
Fluoranthene	< 430 U	430	0	FTASB-06
Fluoranthene	< 420 U	420	0	FTASB-09
Fluoranthene	< 370 U	370	0	FTASB-09
Fluoranthene	480 J	480	1	FTASB-10
Fluoranthene	< 400 U	400	0	FTASB-11
Fluoranthene	640 JL	640	1	FTASB-12
Fluoranthene	220 JQ	220	1	FTASB-13
Fluoranthene	130 JQ	130	1	FTASB-13
Fluoranthene	730	730	1	FTASB-14
Fluoranthene	530	530	1	FTASB-14
Fluoranthene	670	670	1	FTASB-15
Fluoranthene	< 390 U	390	0	FTASB-15
Fluoranthene	< 350 U	350	0	FTASB-16
Fluoranthene	< 390 U	390	0	FTASB-16
Fluoranthene	1100	1100	1	FTASB-17
Fluoranthene	1300	1300	1	FTASB-17
Fluoranthene	< 78 U	78	0	HA01SB001
Fluoranthene	210	210	1	HA01SB002
Fluoranthene	< 83 U	83	0	HA01SB003
Fluoranthene	510	510	1	HMW-10
Fluoranthene	< 410 U	410	0	HMW-10
Fluoranthene	19000	19000	1	HMW-11
Fluoranthene	5200	5200	1	HMW-11
Fluoranthene	870	870	1	HMW-12
Fluoranthene	1200	1200	1	HMW-12
Fluoranthene	120 JQ	120	1	HMW-13
Fluoranthene	< 380 U	380	0	HMW-13
Fluoranthene	< 360 U	360	0	HMW-14
Fluoranthene	2400	2400	1	HMW-14
Fluoranthene	< 340 U	340	0	HMW-14R
Fluoranthene	< 360 U	360	0	HMW-14R
Fluoranthene	< 380 U	380	0	HMW-15
Fluoranthene	< 360 U	360	0	HMW-15
Fluoranthene	72000	72000	1	HMW-16A
Fluoranthene	24000	24000	1	HMW-16A
Fluoranthene	< 360 U	360	0	HMW-17
Fluoranthene	< 370 U	370	0	HMW-17
Fluoranthene	< 420 U	420	0	HMW-18
Fluoranthene	< 380 U	380	0	HMW-18
Fluoranthene	< 110 U	110	0	HSB-1
Fluoranthene	140	140	1	HSB-3
Fluoranthene	< 130 U	130	0	HSB-4
Fluoranthene	360	360	1	HSB-5
Fluoranthene	< 130 U	130	0	HSB-6
Fluoranthene	690	690	1	PSB-1

Constituent	Original Data	Result	D_Result	Location ID
Fluoranthene	< 850 U	850	0	PSB-1
Fluoranthene	120	120	1	PSB-2
Fluoranthene	160	160	1	PSB-2
Fluoranthene	< 84 U	84	0	PSB-2
Fluoranthene	< 83 U	83	0	PSB-2
Fluoranthene	8100	8100	1	PSB-3
Fluoranthene	< 80 U	80	0	PSB-3
Fluoranthene	< 77 U	77	0	PSB-5
Fluoranthene	< 82 U	82	0	PSB-5
Fluoranthene	< 3900 U	3900	0	PSB-6
Fluoranthene	< 80 U	80	0	PSB-7
Fluoranthene	< 340 U	340	0	SB-018
Fluoranthene	< 360 U	360	0	SB-018
Fluoranthene	< 370 U	370	0	SB-019
Fluoranthene	< 370 U	370	0	SB-019
Fluoranthene	< 360 U	360	0	SB-020
Fluoranthene	< 350 U	350	0	SB-020
Fluoranthene	< 340 U	340	0	SB-021
Fluoranthene	< 390 U	390	0	SB-021
Fluoranthene	< 400 U	400	0	SB-022
Fluoranthene	< 400 U	400	0	SB-022
Fluoranthene	520	520	1	SB-023
Fluoranthene	< 410 U	410	0	SB-023
Fluoranthene	< 480 U	480	0	SB-024
Fluoranthene	< 410 U	410	0	SB-024
Fluoranthene	11000	11000	1	SB-025
Fluoranthene	< 390 U	390	0	SB-025
Fluoranthene	13000	13000	1	SB-026
Fluoranthene	< 410 U	410	0	SB-026
Fluoranthene	22000	22000	1	SB-027
Fluoranthene	430	430	1	SB-027
Fluoranthene	< 370 U	370	0	SB-028
Fluoranthene	< 380 U	380	0	SB-028
Fluoranthene	< 360 U	360	0	SB-029
Fluoranthene	< 370 U	370	0	SB-029
Fluoranthene	< 350 U	350	0	SB-030
Fluoranthene	22000	22000	1	SB-030
Fluoranthene	500	500	1	SB-035
Fluoranthene	< 350 U	350	0	SB-035
Fluoranthene	11000	11000	1	SB-036
Fluoranthene	< 390 U	390	0	SB-036
Fluoranthene	< 370 U	370	0	SB-037
Fluoranthene	< 400 U	400	0	SB-037
Fluoranthene	33000	33000	1	SB-038
Fluoranthene	< 430 U	430	0	SB-038
Fluoranthene	< 430 U	430	0	SB-041
Fluoranthene	< 350 U	350	0	SB-041
Fluoranthene	< 440 U	440	0	SB-042
Fluoranthene	< 350 U	350	0	SB-043
Fluoranthene	< 350 U	350	0	SB-043
Fluoranthene	< 350 U	350	0	SB-044
Fluoranthene	< 380 U	380	0	SB-044
Fluoranthene	< 340 UJL	340	0	SB-045
Fluoranthene	< 340 U	340	0	SB-046
Fluoranthene	< 330 UJL	330	0	SB-049
Fluoranthene	< 340 U	340	0	SB-050
Fluorene	< 3 U	3	0	BH-13
Fluorene	< 370 U	370	0	FTASB-04
Fluorene	190 J	190	1	FTASB-04
Fluorene	160 JL	160	1	FTASB-06
Fluorene	< 430 U	430	0	FTASB-06
Fluorene	< 420 U	420	0	FTASB-09
Fluorene	< 370 U	370	0	FTASB-09
Fluorene	2300 JL	2300	1	FTASB-10
Fluorene	210 J	210	1	FTASB-11
Fluorene	1400 J	1400	1	FTASB-12
Fluorene	< 360 U	360	0	FTASB-13
Fluorene	< 430 U	430	0	FTASB-13
Fluorene	< 370 U	370	0	FTASB-14
Fluorene	820	820	1	FTASB-14
Fluorene	< 360 U	360	0	FTASB-15
Fluorene	< 390 U	390	0	FTASB-15

Constituent	Original Data	Result	D_Result	Location ID
Fluorene	< 350 U	350	0	FTASB-16
Fluorene	< 390 U	390	0	FTASB-16
Fluorene	< 350 U	350	0	FTASB-17
Fluorene	< 370 U	370	0	FTASB-17
Fluorene	< 78 U	78	0	HA01SB001
Fluorene	< 71 U	71	0	HA01SB002
Fluorene	< 83 U	83	0	HA01SB003
Fluorene	< 370 U	370	0	HMW-10
Fluorene	< 410 U	410	0	HMW-10
Fluorene	420	420	1	HMW-11
Fluorene	630	630	1	HMW-11
Fluorene	< 400 U	400	0	HMW-12
Fluorene	< 400 U	400	0	HMW-12
Fluorene	640	640	1	HMW-13
Fluorene	< 380 U	380	0	HMW-13
Fluorene	< 360 U	360	0	HMW-14
Fluorene	< 360 U	360	0	HMW-14
Fluorene	< 340 U	340	0	HMW-14R
Fluorene	< 360 U	360	0	HMW-14R
Fluorene	< 380 U	380	0	HMW-15
Fluorene	< 360 U	360	0	HMW-15
Fluorene	< 3500 U	3500	0	HMW-16A
Fluorene	< 790 U	790	0	HMW-16A
Fluorene	< 360 U	360	0	HMW-17
Fluorene	< 370 U	370	0	HMW-17
Fluorene	< 420 U	420	0	HMW-18
Fluorene	< 380 U	380	0	HMW-18
Fluorene	< 110 U	110	0	HSB-1
Fluorene	< 120 U	120	0	HSB-3
Fluorene	< 120 U	120	0	HSB-4
Fluorene	< 130 U	130	0	HSB-5
Fluorene	< 120 U	120	0	HSB-6
Fluorene	< 78 U	78	0	PSB-1
Fluorene	< 850 U	850	0	PSB-1
Fluorene	< 81 U	81	0	PSB-2
Fluorene	< 81 U	81	0	PSB-2
Fluorene	< 84 U	84	0	PSB-2
Fluorene	< 83 U	83	0	PSB-2
Fluorene	< 380 U	380	0	PSB-3
Fluorene	< 80 U	80	0	PSB-3
Fluorene	< 74 U	74	0	PSB-5
Fluorene	< 82 U	82	0	PSB-5
Fluorene	< 3900 U	3900	0	PSB-6
Fluorene	< 80 U	80	0	PSB-7
Fluorene	< 340 U	340	0	SB-018
Fluorene	< 360 U	360	0	SB-018
Fluorene	< 370 U	370	0	SB-019
Fluorene	< 370 U	370	0	SB-019
Fluorene	< 360 U	360	0	SB-020
Fluorene	< 350 U	350	0	SB-020
Fluorene	< 340 U	340	0	SB-021
Fluorene	< 390 U	390	0	SB-021
Fluorene	< 400 U	400	0	SB-022
Fluorene	< 400 U	400	0	SB-022
Fluorene	< 360 U	360	0	SB-023
Fluorene	< 410 U	410	0	SB-023
Fluorene	< 480 U	480	0	SB-024
Fluorene	< 410 U	410	0	SB-024
Fluorene	< 370 U	370	0	SB-025
Fluorene	< 390 U	390	0	SB-025
Fluorene	450	450	1	SB-026
Fluorene	< 410 U	410	0	SB-026
Fluorene	< 1400 U	1400	0	SB-027
Fluorene	< 400 U	400	0	SB-027
Fluorene	< 370 U	370	0	SB-028
Fluorene	< 380 U	380	0	SB-028
Fluorene	< 360 U	360	0	SB-029
Fluorene	< 370 U	370	0	SB-029
Fluorene	< 350 U	350	0	SB-030
Fluorene	3700	3700	1	SB-030
Fluorene	< 360 U	360	0	SB-035
Fluorene	< 350 U	350	0	SB-035

Constituent	Original Data	Result	D_Result	Location ID
Fluorene	< 360 U	360	0	SB-036
Fluorene	< 390 U	390	0	SB-036
Fluorene	< 370 U	370	0	SB-037
Fluorene	< 400 U	400	0	SB-037
Fluorene	3900	3900	1	SB-038
Fluorene	< 430 U	430	0	SB-038
Fluorene	< 430 U	430	0	SB-041
Fluorene	< 350 U	350	0	SB-041
Fluorene	< 440 U	440	0	SB-042
Fluorene	< 350 U	350	0	SB-043
Fluorene	< 350 U	350	0	SB-043
Fluorene	< 350 U	350	0	SB-044
Fluorene	< 380 U	380	0	SB-044
Fluorene	< 340 UJL	340	0	SB-045
Fluorene	< 340 U	340	0	SB-046
Fluorene	< 330 UJL	330	0	SB-049
Fluorene	< 340 U	340	0	SB-050
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	FTASB-04
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	FTASB-04
Indeno(1,2,3-cd)pyrene	190 JL	190	1	FTASB-06
Indeno(1,2,3-cd)pyrene	< 430 U	430	0	FTASB-06
Indeno(1,2,3-cd)pyrene	< 420 JL	420	0	FTASB-09
Indeno(1,2,3-cd)pyrene	80 J	80	1	FTASB-09
Indeno(1,2,3-cd)pyrene	< 1600 JL	1600	0	FTASB-10
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	FTASB-11
Indeno(1,2,3-cd)pyrene	< 1600 JL	1600	0	FTASB-12
Indeno(1,2,3-cd)pyrene	92 JQ	92	1	FTASB-13
Indeno(1,2,3-cd)pyrene	< 430 U	430	0	FTASB-13
Indeno(1,2,3-cd)pyrene	790	790	1	FTASB-14
Indeno(1,2,3-cd)pyrene	< 390 U	390	0	FTASB-14
Indeno(1,2,3-cd)pyrene	600	600	1	FTASB-15
Indeno(1,2,3-cd)pyrene	< 390 U	390	0	FTASB-15
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	FTASB-16
Indeno(1,2,3-cd)pyrene	< 390 U	390	0	FTASB-16
Indeno(1,2,3-cd)pyrene	520	520	1	FTASB-17
Indeno(1,2,3-cd)pyrene	490	490	1	FTASB-17
Indeno(1,2,3-cd)pyrene	< 78 U	78	0	HA01SB001
Indeno(1,2,3-cd)pyrene	< 71 U	71	0	HA01SB002
Indeno(1,2,3-cd)pyrene	< 83 U	83	0	HA01SB003
Indeno(1,2,3-cd)pyrene	210 JQ	210	1	HMW-10
Indeno(1,2,3-cd)pyrene	< 410 U	410	0	HMW-10
Indeno(1,2,3-cd)pyrene	2200	2200	1	HMW-11
Indeno(1,2,3-cd)pyrene	1300	1300	1	HMW-11
Indeno(1,2,3-cd)pyrene	440	440	1	HMW-12
Indeno(1,2,3-cd)pyrene	580	580	1	HMW-12
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	HMW-13
Indeno(1,2,3-cd)pyrene	< 380 U	380	0	HMW-13
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	HMW-14
Indeno(1,2,3-cd)pyrene	1200	1200	1	HMW-14
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	HMW-14R
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	HMW-14R
Indeno(1,2,3-cd)pyrene	< 380 U	380	0	HMW-15
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	HMW-15
Indeno(1,2,3-cd)pyrene	16000	16000	1	HMW-16A
Indeno(1,2,3-cd)pyrene	6400	6400	1	HMW-16A
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	HMW-17
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	HMW-17
Indeno(1,2,3-cd)pyrene	< 420 U	420	0	HMW-18
Indeno(1,2,3-cd)pyrene	< 380 U	380	0	HMW-18
Indeno(1,2,3-cd)pyrene	< 95 U	95	0	HSB-1
Indeno(1,2,3-cd)pyrene	< 110 U	110	0	HSB-3
Indeno(1,2,3-cd)pyrene	< 110 U	110	0	HSB-4
Indeno(1,2,3-cd)pyrene	< 120 U	120	0	HSB-5
Indeno(1,2,3-cd)pyrene	< 110 U	110	0	HSB-6
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-1
Indeno(1,2,3-cd)pyrene	< 1900 U	1900	0	PSB-1
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-2
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-2
Indeno(1,2,3-cd)pyrene	< 190 U	190	0	PSB-2
Indeno(1,2,3-cd)pyrene	< 190 U	190	0	PSB-2
Indeno(1,2,3-cd)pyrene	< 870 U	870	0	PSB-3
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-3

Constituent	Original Data	Result	D_Result	Location ID
Indeno(1,2,3-cd)pyrene	< 170 U	170	0	PSB-5
Indeno(1,2,3-cd)pyrene	< 190 U	190	0	PSB-5
Indeno(1,2,3-cd)pyrene	< 9000 U	9000	0	PSB-6
Indeno(1,2,3-cd)pyrene	< 180 U	180	0	PSB-7
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	SB-018
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	SB-018
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-019
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-019
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	SB-020
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-020
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	SB-021
Indeno(1,2,3-cd)pyrene	< 390 U	390	0	SB-021
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	SB-022
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	SB-022
Indeno(1,2,3-cd)pyrene	520	520	1	SB-023
Indeno(1,2,3-cd)pyrene	< 410 U	410	0	SB-023
Indeno(1,2,3-cd)pyrene	< 480 U	480	0	SB-024
Indeno(1,2,3-cd)pyrene	< 410 U	410	0	SB-024
Indeno(1,2,3-cd)pyrene	4600	4600	1	SB-025
Indeno(1,2,3-cd)pyrene	< 390 U	390	0	SB-025
Indeno(1,2,3-cd)pyrene	3500	3500	1	SB-026
Indeno(1,2,3-cd)pyrene	< 410 U	410	0	SB-026
Indeno(1,2,3-cd)pyrene	11000	11000	1	SB-027
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	SB-027
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-028
Indeno(1,2,3-cd)pyrene	< 380 U	380	0	SB-028
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	SB-029
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-029
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-030
Indeno(1,2,3-cd)pyrene	11000	11000	1	SB-030
Indeno(1,2,3-cd)pyrene	< 360 U	360	0	SB-035
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-035
Indeno(1,2,3-cd)pyrene	5700	5700	1	SB-036
Indeno(1,2,3-cd)pyrene	< 390 U	390	0	SB-036
Indeno(1,2,3-cd)pyrene	< 370 U	370	0	SB-037
Indeno(1,2,3-cd)pyrene	< 400 U	400	0	SB-037
Indeno(1,2,3-cd)pyrene	5600 J	5600	1	SB-038
Indeno(1,2,3-cd)pyrene	< 430 U	430	0	SB-038
Indeno(1,2,3-cd)pyrene	< 430 U	430	0	SB-041
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-041
Indeno(1,2,3-cd)pyrene	< 440 U	440	0	SB-042
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-043
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-043
Indeno(1,2,3-cd)pyrene	< 350 U	350	0	SB-044
Indeno(1,2,3-cd)pyrene	< 380 U	380	0	SB-044
Indeno(1,2,3-cd)pyrene	< 340 UJL	340	0	SB-045
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	SB-046
Indeno(1,2,3-cd)pyrene	< 330 UJL	330	0	SB-049
Indeno(1,2,3-cd)pyrene	< 340 U	340	0	SB-050
Lead	1.18	1.18	1	BH-13
Lead	15000	15000	1	EB-E8
Lead	ND [5500]	5500	1	EB-F5 [DUP]
Lead	23000	23000	1	EB-F7
Lead	7200	7200	1	EB-F8
Lead	15000	15000	1	EB-G6
Lead	12000	12000	1	EB-G7
Lead	16000	16000	1	EB-H5
Lead	20000	20000	1	EB-H8
Lead	ND [13000]	13000	1	EB-I5 [DUP]
Lead	10000	10000	1	EB-J4
Lead	5800	5800	1	EB-J5
Lead	6300 [--]	6300	1	EB-J6 [DUP]
Lead	6400	6400	1	EB-J7
Lead	49000	49000	1	EB-K4
Lead	11000	11000	1	EB-K5
Lead	7800	7800	1	EB-K7
Lead	9700	9700	1	EB-L5
Lead	16000	16000	1	EB-L7
Lead	15000	15000	1	EW-E6-a
Lead	22000	22000	1	EW-E6-b
Lead	6200	6200	1	EW-E7-a
Lead	18000	18000	1	EW-F5

Constituent	Original Data	Result	D_Result	Location ID
Lead	16000	16000	1	EW-G5-b
Lead	5600	5600	1	EW-H4
Lead	8900	8900	1	EW-I4-a
Lead	5100	5100	1	EW-I4-b
Lead	16000 [53000]	53000	1	EW-K4 [DUP]
Lead	10000	10000	1	EW-L4
Lead	16000	16000	1	EW-L5-a
Lead	11000	11000	1	EW-L8-B
Lead	2700	2700	1	FTASB-04
Lead	3500	3500	1	FTASB-04
Lead	15000	15000	1	FTASB-06
Lead	2400	2400	1	FTASB-06
Lead	4700	4700	1	FTASB-09
Lead	59000	59000	1	FTASB-09
Lead	11100	11100	1	FTASB-10
Lead	6200	6200	1	FTASB-11
Lead	11300	11300	1	FTASB-12
Lead	7700	7700	1	FTASB-13
Lead	22000	22000	1	FTASB-13
Lead	11400	11400	1	FTASB-14
Lead	8800	8800	1	FTASB-14
Lead	13900	13900	1	FTASB-15
Lead	5400	5400	1	FTASB-15
Lead	3400	3400	1	FTASB-16
Lead	3100	3100	1	FTASB-16
Lead	12400	12400	1	FTASB-17
Lead	2000	2000	1	FTASB-17
Lead	3800	3800	1	HA01-MW-09
Lead	5900	5900	1	HA01-MW-09
Lead	6000	6000	1	HA01-MW-10
Lead	2200	2200	1	HA01-MW-10
Lead	4500	4500	1	HA01-MW-11
Lead	6500	6500	1	HA01-MW-11
Lead	8500	8500	1	A01-MW-11 (DUF
Lead	4200	4200	1	HA01-MW-12
Lead	3200	3200	1	HA01-MW-12
Lead	2100	2100	1	HA01-MW-13
Lead	5200	5200	1	HA01-MW-13
Lead	6800	6800	1	HA01-MW-14
Lead	2000	2000	1	HA01-MW-14
Lead	3600	3600	1	HA01-MW-15
Lead	1800	1800	1	HA01-MW-15
Lead	2900	2900	1	HA01-MW-16
Lead	2300	2300	1	HA01-MW-17
Lead	5200	5200	1	HA01-MW-17
Lead	4200	4200	1	HA01SB001
Lead	2000	2000	1	HA01SB001
Lead	17000	17000	1	HMW-10
Lead	11800	11800	1	HMW-10
Lead	2700	2700	1	HMW-11
Lead	2200	2200	1	HMW-11
Lead	2500	2500	1	HMW-12
Lead	2000	2000	1	HMW-12
Lead	16400	16400	1	HMW-13
Lead	3200	3200	1	HMW-13
Lead	< 5260 U	5260	0	HSB-1
Lead	< 5970 U	5970	0	HSB-3
Lead	< 5810 U	5810	0	HSB-4
Lead	7400	7400	1	HSB-5
Lead	< 5970 U	5970	0	HSB-6
Lead	28000	28000	1	PSB-1
Lead	< 7620 U	7620	0	PSB-1
Lead	17300	17300	1	PSB-2
Lead	15800	15800	1	PSB-2
Lead	8820	8820	1	PSB-2
Lead	7580	7580	1	PSB-2
Lead	7390	7390	1	PSB-3
Lead	< 7280 U	7280	0	PSB-3
Lead	< 6700 U	6700	0	PSB-5
Lead	< 7310 U	7310	0	PSB-5
Lead	< 7160 U	7160	0	PSB-6
Lead	< 7190 U	7190	0	PSB-7

Constituent	Original Data	Result	D_Result	Location ID
Methylene chloride	< 6 U	6	0	FTASB-04
Methylene chloride	< 6 U	6	0	FTASB-04
Methylene chloride	2 J	2	1	FTASB-06
Methylene chloride	3 J	3	1	FTASB-06
Methylene chloride	< 6 U	6	0	FTASB-09
Methylene chloride	< 6 U	6	0	FTASB-09
Methylene chloride	< 770 U	770	0	FTASB-10
Methylene chloride	< 6 U	6	0	FTASB-11
Methylene chloride	< 770 U	770	0	FTASB-12
Methylene chloride	< 6 U	6	0	FTASB-13
Methylene chloride	3 JH	3	1	FTASB-13
Methylene chloride	3 JQ	3	1	FTASB-14
Methylene chloride	< 30 U	30	0	FTASB-14
Methylene chloride	< 5 U	5	0	FTASB-15
Methylene chloride	2 JQ	2	1	FTASB-15
Methylene chloride	< 5 U	5	0	FTASB-16
Methylene chloride	5 JQ	5	1	FTASB-16
Methylene chloride	4 JQ	4	1	FTASB-17
Methylene chloride	< 6 U	6	0	FTASB-17
Methylene chloride	< 5.5 U	5.5	0	HA01-MW-09
Methylene chloride	< 5.1 U	5.1	0	HA01-MW-09
Methylene chloride	< 8.8 U	8.8	0	HA01-MW-10
Methylene chloride	< 6.8 U	6.8	0	HA01-MW-10
Methylene chloride	< 6.7 U	6.7	0	HA01-MW-11
Methylene chloride	< 5.8 U	5.8	0	HA01-MW-11
Methylene chloride	< 5.1 U	5.1	0	HA01-MW-11 (DUP
Methylene chloride	< 6.9 U	6.9	0	HA01-MW-12
Methylene chloride	< 5.8 U	5.8	0	HA01-MW-12
Methylene chloride	< 6.9 U	6.9	0	HA01-MW-13
Methylene chloride	< 5.6 U	5.6	0	HA01-MW-13
Methylene chloride	< 6.2 U	6.2	0	HA01-MW-14
Methylene chloride	< 5.9 U	5.9	0	HA01-MW-14
Methylene chloride	< 6.3 U	6.3	0	HA01-MW-15
Methylene chloride	< 6.9 U	6.9	0	HA01-MW-15
Methylene chloride	< 5.4 U	5.4	0	HA01-MW-16
Methylene chloride	< 6.1 U	6.1	0	HA01-MW-17
Methylene chloride	< 5.8 U	5.8	0	HA01-MW-17
Methylene chloride	< 6 U	6	0	HMW-10
Methylene chloride	< 6 U	6	0	HMW-10
Methylene chloride	< 6 U	6	0	HMW-11
Methylene chloride	< 6 U	6	0	HMW-11
Methylene chloride	< 6 U	6	0	HMW-12
Methylene chloride	< 6 U	6	0	HMW-12
Methylene chloride	< 1600 U	1600	0	HMW-13
Methylene chloride	< 29 U	29	0	HMW-13
Methylene chloride	< 1.7 U	1.7	0	HSB-1
Methylene chloride	< 240 U	240	0	HSB-3
Methylene chloride	< 1.9 U	1.9	0	HSB-4
Methylene chloride	< 2600 U	2600	0	HSB-5
Methylene chloride	6.7	6.7	1	HSB-6
Methylene chloride	< 5.6 U	5.6	0	PSB-1
Methylene chloride	< 30 U	30	0	PSB-1
Methylene chloride	< 5.8 U	5.8	0	PSB-2
Methylene chloride	< 5.8 U	5.8	0	PSB-2
Methylene chloride	< 6 U	6	0	PSB-2
Methylene chloride	< 6 U	6	0	PSB-2
Methylene chloride	< 5.4 U	5.4	0	PSB-3
Methylene chloride	< 5.7 U	5.7	0	PSB-3
Methylene chloride	< 5.3 U	5.3	0	PSB-5
Methylene chloride	< 5.8 U	5.8	0	PSB-5
Methylene chloride	< 28 U	28	0	PSB-6
Methylene chloride	< 5.7 U	5.7	0	PSB-7
Naphthalene	< 2 U	2	0	BH-13
Naphthalene	3900	3900	1	EB-E7 [Dpu]
Naphthalene	2500	2500	1	EB-F6
Naphthalene	14000	14000	1	EB-F7
Naphthalene	4800	4800	1	EB-G6
Naphthalene	7400	7400	1	EB-G7
Naphthalene	8400	8400	1	EB-H5
Naphthalene	4500	4500	1	EB-H6
Naphthalene	5500	5500	1	EB-H7
Naphthalene	4500	4500	1	EB-H8

Constituent	Original Data	Result	D_Result	Location ID
Naphthalene	14000	14000	1	EB-I6
Naphthalene	10000	10000	1	EB-I7
Naphthalene	4400	4400	1	EB-I8
Naphthalene	11000 [--]	11000	1	EB-J6 [DUP]
Naphthalene	11000	11000	1	EB-K4
Naphthalene	11000	11000	1	EB-K5
Naphthalene	8200	8200	1	EB-K7
Naphthalene	36000	36000	1	EB-L5
Naphthalene	7300	7300	1	EB-L6
Naphthalene	14000	14000	1	EB-L7
Naphthalene	9500	9500	1	EB-L8
Naphthalene	4900	4900	1	EW-E6-a
Naphthalene	17000	17000	1	EW-E7-a
Naphthalene	8400	8400	1	EW-I4-a
Naphthalene	< 370 U	370	0	FTASB-04
Naphthalene	110 J	110	1	FTASB-04
Naphthalene	100 J	100	1	FTASB-06
Naphthalene	< 430 U	430	0	FTASB-06
Naphthalene	< 420 U	420	0	FTASB-09
Naphthalene	< 370 U	370	0	FTASB-09
Naphthalene	79000 JL	79000	1	FTASB-10
Naphthalene	3400	3400	1	FTASB-11
Naphthalene	35000	35000	1	FTASB-12
Naphthalene	< 360 U	360	0	FTASB-13
Naphthalene	< 430 U	430	0	FTASB-13
Naphthalene	< 370 U	370	0	FTASB-14
Naphthalene	21000	21000	1	FTASB-14
Naphthalene	< 360 U	360	0	FTASB-15
Naphthalene	< 390 U	390	0	FTASB-15
Naphthalene	< 350 U	350	0	FTASB-16
Naphthalene	< 390 U	390	0	FTASB-16
Naphthalene	< 350 U	350	0	FTASB-17
Naphthalene	< 370 U	370	0	FTASB-17
Naphthalene	< 78 U	78	0	HA01SB001
Naphthalene	5300	5300	1	HA01SB002
Naphthalene	< 83 U	83	0	HA01SB003
Naphthalene	< 370 U	370	0	HMW-10
Naphthalene	< 410 U	410	0	HMW-10
Naphthalene	< 400 U	400	0	HMW-11
Naphthalene	1000	1000	1	HMW-11
Naphthalene	< 400 U	400	0	HMW-12
Naphthalene	< 400 U	400	0	HMW-12
Naphthalene	22000	22000	1	HMW-13
Naphthalene	220 JQ	220	1	HMW-13
Naphthalene	< 360 U	360	0	HMW-14
Naphthalene	< 360 U	360	0	HMW-14
Naphthalene	< 340 U	340	0	HMW-14R
Naphthalene	< 360 U	360	0	HMW-14R
Naphthalene	< 380 U	380	0	HMW-15
Naphthalene	< 360 U	360	0	HMW-15
Naphthalene	< 3500 U	3500	0	HMW-16A
Naphthalene	< 790 U	790	0	HMW-16A
Naphthalene	< 360 U	360	0	HMW-17
Naphthalene	< 370 U	370	0	HMW-17
Naphthalene	< 420 U	420	0	HMW-18
Naphthalene	< 380 U	380	0	HMW-18
Naphthalene	< 210 U	210	0	HSB-1
Naphthalene	5700	5700	1	HSB-3
Naphthalene	< 230 U	230	0	HSB-4
Naphthalene	11000	11000	1	HSB-5
Naphthalene	< 240 U	240	0	HSB-6
Naphthalene	< 78 U	78	0	PSB-1
Naphthalene	3500	3500	1	PSB-1
Naphthalene	< 81 U	81	0	PSB-2
Naphthalene	< 81 U	81	0	PSB-2
Naphthalene	< 84 U	84	0	PSB-2
Naphthalene	< 83 U	83	0	PSB-2
Naphthalene	< 380 U	380	0	PSB-3
Naphthalene	< 80 U	80	0	PSB-3
Naphthalene	< 74 U	74	0	PSB-5
Naphthalene	< 82 U	82	0	PSB-5
Naphthalene	41000	41000	1	PSB-6

Constituent	Original Data	Result	D_Result	Location ID
Naphthalene	< 80 U	80	0	PSB-7
Naphthalene	< 340 U	340	0	SB-018
Naphthalene	< 360 U	360	0	SB-018
Naphthalene	< 370 U	370	0	SB-019
Naphthalene	< 370 U	370	0	SB-019
Naphthalene	< 360 U	360	0	SB-020
Naphthalene	< 350 U	350	0	SB-020
Naphthalene	< 340 U	340	0	SB-021
Naphthalene	< 390 U	390	0	SB-021
Naphthalene	< 400 U	400	0	SB-022
Naphthalene	< 400 U	400	0	SB-022
Naphthalene	< 360 U	360	0	SB-023
Naphthalene	< 410 U	410	0	SB-023
Naphthalene	< 480 U	480	0	SB-024
Naphthalene	< 410 U	410	0	SB-024
Naphthalene	< 370 U	370	0	SB-025
Naphthalene	< 390 U	390	0	SB-025
Naphthalene	< 410 U	410	0	SB-026
Naphthalene	< 410 U	410	0	SB-026
Naphthalene	< 1400 U	1400	0	SB-027
Naphthalene	< 400 U	400	0	SB-027
Naphthalene	< 370 U	370	0	SB-028
Naphthalene	< 380 U	380	0	SB-028
Naphthalene	< 360 U	360	0	SB-029
Naphthalene	< 370 U	370	0	SB-029
Naphthalene	< 350 U	350	0	SB-030
Naphthalene	< 1900 U	1900	0	SB-030
Naphthalene	< 360 U	360	0	SB-035
Naphthalene	< 350 U	350	0	SB-035
Naphthalene	< 360 U	360	0	SB-036
Naphthalene	< 390 U	390	0	SB-036
Naphthalene	< 370 U	370	0	SB-037
Naphthalene	< 400 U	400	0	SB-037
Naphthalene	530	530	1	SB-038
Naphthalene	< 430 U	430	0	SB-038
Naphthalene	< 430 U	430	0	SB-041
Naphthalene	< 350 U	350	0	SB-041
Naphthalene	< 440 U	440	0	SB-042
Naphthalene	< 350 U	350	0	SB-043
Naphthalene	< 350 U	350	0	SB-043
Naphthalene	< 350 U	350	0	SB-044
Naphthalene	< 380 U	380	0	SB-044
Naphthalene	< 340 UJL	340	0	SB-045
Naphthalene	< 340 U	340	0	SB-046
Naphthalene	< 330 UJL	330	0	SB-049
Naphthalene	< 340 U	340	0	SB-050
Phenanthrene	< 3 U	3	0	BH-13
Phenanthrene	400	400	1	EB-J8
Phenanthrene	550	550	1	EB-L6
Phenanthrene	< 370 U	370	0	FTASB-04
Phenanthrene	180 J	180	1	FTASB-04
Phenanthrene	300 J	300	1	FTASB-06
Phenanthrene	< 430 U	430	0	FTASB-06
Phenanthrene	< 420 U	420	0	FTASB-09
Phenanthrene	140 J	140	1	FTASB-09
Phenanthrene	2000	2000	1	FTASB-10
Phenanthrene	360 J	360	1	FTASB-11
Phenanthrene	4200 JL	4200	1	FTASB-12
Phenanthrene	49 JQ	49	1	FTASB-13
Phenanthrene	< 430 U	430	0	FTASB-13
Phenanthrene	98 JQ	98	1	FTASB-14
Phenanthrene	760	760	1	FTASB-14
Phenanthrene	62 JQ	62	1	FTASB-15
Phenanthrene	< 390 U	390	0	FTASB-15
Phenanthrene	< 350 U	350	0	FTASB-16
Phenanthrene	< 390 U	390	0	FTASB-16
Phenanthrene	300 JQ	300	1	FTASB-17
Phenanthrene	420	420	1	FTASB-17
Phenanthrene	< 78 U	78	0	HA01SB001
Phenanthrene	660	660	1	HA01SB002
Phenanthrene	< 83 U	83	0	HA01SB003
Phenanthrene	170 JQ	170	1	HMW-10

Constituent	Original Data	Result	D_Result	Location ID
Phenanthrene	< 410 U	410	0	HMW-10
Phenanthrene	6300	6300	1	HMW-11
Phenanthrene	3300	3300	1	HMW-11
Phenanthrene	71 JQ	71	1	HMW-12
Phenanthrene	130 JQ	130	1	HMW-12
Phenanthrene	300 JQ	300	1	HMW-13
Phenanthrene	< 380 U	380	0	HMW-13
Phenanthrene	< 360 U	360	0	HMW-14
Phenanthrene	< 360 U	360	0	HMW-14
Phenanthrene	< 340 U	340	0	HMW-14R
Phenanthrene	< 360 U	360	0	HMW-14R
Phenanthrene	< 380 U	380	0	HMW-15
Phenanthrene	< 360 U	360	0	HMW-15
Phenanthrene	32000	32000	1	HMW-16A
Phenanthrene	10000	10000	1	HMW-16A
Phenanthrene	< 360 U	360	0	HMW-17
Phenanthrene	< 370 U	370	0	HMW-17
Phenanthrene	< 420 U	420	0	HMW-18
Phenanthrene	< 380 U	380	0	HMW-18
Phenanthrene	< 67 U	67	0	HSB-1
Phenanthrene	150	150	1	HSB-3
Phenanthrene	< 74 U	74	0	HSB-4
Phenanthrene	290	290	1	HSB-5
Phenanthrene	< 76 U	76	0	HSB-6
Phenanthrene	440	440	1	PSB-1
Phenanthrene	< 850 U	850	0	PSB-1
Phenanthrene	< 81 U	81	0	PSB-2
Phenanthrene	< 81 U	81	0	PSB-2
Phenanthrene	< 84 U	84	0	PSB-2
Phenanthrene	< 83 U	83	0	PSB-2
Phenanthrene	670	670	1	PSB-3
Phenanthrene	< 80 U	80	0	PSB-3
Phenanthrene	< 74 U	74	0	PSB-5
Phenanthrene	< 82 U	82	0	PSB-5
Phenanthrene	< 3900 U	3900	0	PSB-6
Phenanthrene	< 80 U	80	0	PSB-7
Phenanthrene	< 340 U	340	0	SB-018
Phenanthrene	< 360 U	360	0	SB-018
Phenanthrene	< 370 U	370	0	SB-019
Phenanthrene	< 370 U	370	0	SB-019
Phenanthrene	< 360 U	360	0	SB-020
Phenanthrene	< 350 U	350	0	SB-020
Phenanthrene	< 340 U	340	0	SB-021
Phenanthrene	< 390 U	390	0	SB-021
Phenanthrene	< 400 U	400	0	SB-022
Phenanthrene	< 400 U	400	0	SB-022
Phenanthrene	< 360 U	360	0	SB-023
Phenanthrene	< 410 U	410	0	SB-023
Phenanthrene	< 480 U	480	0	SB-024
Phenanthrene	< 410 U	410	0	SB-024
Phenanthrene	2000	2000	1	SB-025
Phenanthrene	< 390 U	390	0	SB-025
Phenanthrene	7300	7300	1	SB-026
Phenanthrene	< 410 U	410	0	SB-026
Phenanthrene	7100	7100	1	SB-027
Phenanthrene	< 400 U	400	0	SB-027
Phenanthrene	< 370 U	370	0	SB-028
Phenanthrene	< 380 U	380	0	SB-028
Phenanthrene	< 360 U	360	0	SB-029
Phenanthrene	< 370 U	370	0	SB-029
Phenanthrene	< 350 U	350	0	SB-030
Phenanthrene	19000	19000	1	SB-030
Phenanthrene	< 360 U	360	0	SB-035
Phenanthrene	< 350 U	350	0	SB-035
Phenanthrene	2400 J	2400	1	SB-036
Phenanthrene	< 390 U	390	0	SB-036
Phenanthrene	< 370 U	370	0	SB-037
Phenanthrene	< 400 U	400	0	SB-037
Phenanthrene	39000	39000	1	SB-038
Phenanthrene	< 430 U	430	0	SB-038
Phenanthrene	< 430 U	430	0	SB-041
Phenanthrene	< 350 U	350	0	SB-041

Constituent	Original Data	Result	D_Result	Location ID
Phenanthrene	< 440 U	440	0	SB-042
Phenanthrene	< 350 U	350	0	SB-043
Phenanthrene	< 350 U	350	0	SB-043
Phenanthrene	< 350 U	350	0	SB-044
Phenanthrene	< 380 U	380	0	SB-044
Phenanthrene	< 340 UJL	340	0	SB-045
Phenanthrene	< 340 U	340	0	SB-046
Phenanthrene	< 330 UJL	330	0	SB-049
Phenanthrene	< 340 U	340	0	SB-050
Pyrene	< 370 U	370	0	FTASB-04
Pyrene	180 J	180	1	FTASB-04
Pyrene	470	470	1	FTASB-06
Pyrene	< 430 U	430	0	FTASB-06
Pyrene	< 420 U	420	0	FTASB-09
Pyrene	< 370 U	370	0	FTASB-09
Pyrene	950 J	950	1	FTASB-10
Pyrene	< 400 U	400	0	FTASB-11
Pyrene	1200 J	1200	1	FTASB-12
Pyrene	260 JQ	260	1	FTASB-13
Pyrene	130 JQ	130	1	FTASB-13
Pyrene	1200	1200	1	FTASB-14
Pyrene	460	460	1	FTASB-14
Pyrene	780	780	1	FTASB-15
Pyrene	< 390 U	390	0	FTASB-15
Pyrene	< 350 U	350	0	FTASB-16
Pyrene	< 390 U	390	0	FTASB-16
Pyrene	1000	1000	1	FTASB-17
Pyrene	2300 JL	2300	1	FTASB-17
Pyrene	< 78 U	78	0	HA01SB001
Pyrene	220	220	1	HA01SB002
Pyrene	< 83 U	83	0	HA01SB003
Pyrene	670	670	1	HMW-10
Pyrene	< 410 U	410	0	HMW-10
Pyrene	14000	14000	1	HMW-11
Pyrene	7200	7200	1	HMW-11
Pyrene	900	900	1	HMW-12
Pyrene	1300	1300	1	HMW-12
Pyrene	140 JQ	140	1	HMW-13
Pyrene	< 380 U	380	0	HMW-13
Pyrene	< 360 U	360	0	HMW-14
Pyrene	2000	2000	1	HMW-14
Pyrene	< 340 U	340	0	HMW-14R
Pyrene	< 360 U	360	0	HMW-14R
Pyrene	< 380 U	380	0	HMW-15
Pyrene	< 360 U	360	0	HMW-15
Pyrene	49000	49000	1	HMW-16A
Pyrene	17000	17000	1	HMW-16A
Pyrene	< 360 U	360	0	HMW-17
Pyrene	< 370 U	370	0	HMW-17
Pyrene	< 420 U	420	0	HMW-18
Pyrene	< 380 U	380	0	HMW-18
Pyrene	< 72 U	72	0	HSB-1
Pyrene	140	140	1	HSB-3
Pyrene	< 79 U	79	0	HSB-4
Pyrene	540	540	1	HSB-5
Pyrene	< 81 U	81	0	HSB-6
Pyrene	580	580	1	PSB-1
Pyrene	< 850 U	850	0	PSB-1
Pyrene	190	190	1	PSB-2
Pyrene	130	130	1	PSB-2
Pyrene	< 84 U	84	0	PSB-2
Pyrene	< 83 U	83	0	PSB-2
Pyrene	5200	5200	1	PSB-3
Pyrene	< 80 U	80	0	PSB-3
Pyrene	< 74 U	74	0	PSB-5
Pyrene	< 82 U	82	0	PSB-5
Pyrene	< 3900 U	3900	0	PSB-6
Pyrene	< 80 U	80	0	PSB-7
Pyrene	< 340 U	340	0	SB-018
Pyrene	< 360 U	360	0	SB-018
Pyrene	< 370 U	370	0	SB-019
Pyrene	< 370 U	370	0	SB-019

Constituent	Original Data	Result	D_Result	Location ID
Pyrene	< 360 U	360	0	SB-020
Pyrene	< 350 U	350	0	SB-020
Pyrene	< 340 U	340	0	SB-021
Pyrene	< 390 U	390	0	SB-021
Pyrene	< 400 U	400	0	SB-022
Pyrene	< 400 U	400	0	SB-022
Pyrene	530	530	1	SB-023
Pyrene	< 410 U	410	0	SB-023
Pyrene	< 480 U	480	0	SB-024
Pyrene	< 410 U	410	0	SB-024
Pyrene	8500	8500	1	SB-025
Pyrene	< 390 U	390	0	SB-025
Pyrene	8700	8700	1	SB-026
Pyrene	< 410 U	410	0	SB-026
Pyrene	18000	18000	1	SB-027
Pyrene	410	410	1	SB-027
Pyrene	< 370 U	370	0	SB-028
Pyrene	< 380 U	380	0	SB-028
Pyrene	< 360 U	360	0	SB-029
Pyrene	< 370 U	370	0	SB-029
Pyrene	< 350 U	350	0	SB-030
Pyrene	26000 J	26000	1	SB-030
Pyrene	< 360 U	360	0	SB-035
Pyrene	< 350 U	350	0	SB-035
Pyrene	10000 J	10000	1	SB-036
Pyrene	< 390 U	390	0	SB-036
Pyrene	< 370 U	370	0	SB-037
Pyrene	< 400 U	400	0	SB-037
Pyrene	25000 J	25000	1	SB-038
Pyrene	< 430 U	430	0	SB-038
Pyrene	< 430 U	430	0	SB-041
Pyrene	< 350 UJ	350	0	SB-041
Pyrene	< 440 U	440	0	SB-042
Pyrene	< 350 UJ	350	0	SB-043
Pyrene	< 350 UJ	350	0	SB-043
Pyrene	< 350 UJ	350	0	SB-044
Pyrene	< 380 UJ	380	0	SB-044
Pyrene	< 340 UJL	340	0	SB-045
Pyrene	< 340 UJ	340	0	SB-046
Pyrene	< 330 UJL	330	0	SB-049
Pyrene	< 340 U	340	0	SB-050
Toluene	370	370	1	EB-K6
Toluene	32000	32000	1	EB-K7
Toluene	< 6 U	6	0	FTASB-04
Toluene	2 J	2	1	FTASB-04
Toluene	20	20	1	FTASB-06
Toluene	5 J	5	1	FTASB-06
Toluene	3 J	3	1	FTASB-09
Toluene	11	11	1	FTASB-09
Toluene	920	920	1	FTASB-10
Toluene	21	21	1	FTASB-11
Toluene	16000	16000	1	FTASB-12
Toluene	< 6 U	6	0	FTASB-13
Toluene	< 7 U	7	0	FTASB-13
Toluene	< 6 U	6	0	FTASB-14
Toluene	< 30 U	30	0	FTASB-14
Toluene	< 5 U	5	0	FTASB-15
Toluene	< 6 U	6	0	FTASB-15
Toluene	< 5 U	5	0	FTASB-16
Toluene	< 6 U	6	0	FTASB-16
Toluene	2 JQ	2	1	FTASB-17
Toluene	< 6 U	6	0	FTASB-17
Toluene	< 5.5 U	5.5	0	HA01-MW-09
Toluene	< 5.1 U	5.1	0	HA01-MW-09
Toluene	< 8.8 U	8.8	0	HA01-MW-10
Toluene	< 6.8 U	6.8	0	HA01-MW-10
Toluene	< 6.7 U	6.7	0	HA01-MW-11
Toluene	< 5.8 U	5.8	0	HA01-MW-11
Toluene	< 5.1 U	5.1	0	HA01-MW-11 (DUP
Toluene	< 6.9 U	6.9	0	HA01-MW-12
Toluene	< 5.8 UJ	5.8	0	HA01-MW-12
Toluene	< 6.9 U	6.9	0	HA01-MW-13

Constituent	Original Data	Result	D_Result	Location ID
Toluene	< 5.6 U	5.6	0	HA01-MW-13
Toluene	< 6.2 U	6.2	0	HA01-MW-14
Toluene	< 5.9 U	5.9	0	HA01-MW-14
Toluene	< 6.3 U	6.3	0	HA01-MW-15
Toluene	< 6.9 U	6.9	0	HA01-MW-15
Toluene	< 5.4 U	5.4	0	HA01-MW-16
Toluene	13	13	1	HA01-MW-17
Toluene	2.2 J	2.2	1	HA01-MW-17
Toluene	< 5.1 U	5.1	0	HA01SB001
Toluene	< 6 U	6	0	HMW-10
Toluene	2 JQ	2	1	HMW-10
Toluene	2 JQ	2	1	HMW-11
Toluene	8	8	1	HMW-11
Toluene	1 JH	1	1	HMW-12
Toluene	1 JQ	1	1	HMW-12
Toluene	2200	2200	1	HMW-13
Toluene	13 JQ	13	1	HMW-13
Toluene	< 5.7 U	5.7	0	HMW-14
Toluene	< 6 U	6	0	HMW-14
Toluene	< 5.2 U	5.2	0	HMW-14R
Toluene	< 5.4 U	5.4	0	HMW-14R
Toluene	< 7 U	7	0	HMW-15
Toluene	< 6.2 U	6.2	0	HMW-15
Toluene	< 6.2 U	6.2	0	HMW-16A
Toluene	< 6.5 U	6.5	0	HMW-16A
Toluene	< 6 U	6	0	HMW-17
Toluene	< 6.3 U	6.3	0	HMW-17
Toluene	< 6.4 UJ	6.4	0	HMW-18
Toluene	< 5.8 UJ	5.8	0	HMW-18
Toluene	2.8	2.8	1	HSB-1
Toluene	< 100 U	100	0	HSB-3
Toluene	< 0.82 U	0.82	0	HSB-4
Toluene	< 1100 U	1100	0	HSB-5
Toluene	5.5	5.5	1	HSB-6
Toluene	< 5.6 U	5.6	0	PSB-1
Toluene	< 30 U	30	0	PSB-1
Toluene	< 5.8 U	5.8	0	PSB-2
Toluene	< 5.8 U	5.8	0	PSB-2
Toluene	< 6 U	6	0	PSB-2
Toluene	< 6 U	6	0	PSB-2
Toluene	< 5.4 U	5.4	0	PSB-3
Toluene	< 5.7 U	5.7	0	PSB-3
Toluene	< 5.3 U	5.3	0	PSB-5
Toluene	< 5.8 U	5.8	0	PSB-5
Toluene	< 28 U	28	0	PSB-6
Toluene	< 5.7 U	5.7	0	PSB-7
Toluene	< 5.6 U	5.6	0	SB-018
Toluene	< 5.8 U	5.8	0	SB-018
Toluene	< 6.4 U	6.4	0	SB-019
Toluene	< 6.4 U	6.4	0	SB-019
Toluene	< 6.2 U	6.2	0	SB-020
Toluene	< 6.2 U	6.2	0	SB-020
Toluene	< 6.4 U	6.4	0	SB-021
Toluene	< 6.7 U	6.7	0	SB-021
Toluene	< 6.6 U	6.6	0	SB-022
Toluene	< 5.4 U	5.4	0	SB-022
Toluene	< 6.4 U	6.4	0	SB-023
Toluene	20	20	1	SB-023
Toluene	< 11 U	11	0	SB-024
Toluene	< 8.7 U	8.7	0	SB-024
Toluene	< 5.6 U	5.6	0	SB-025
Toluene	< 6 U	6	0	SB-025
Toluene	< 6.9 U	6.9	0	SB-026
Toluene	< 6.5 U	6.5	0	SB-026
Toluene	< 6.5 U	6.5	0	SB-027
Toluene	< 5.6 U	5.6	0	SB-027
Toluene	< 6.7 U	6.7	0	SB-028
Toluene	< 6.1 U	6.1	0	SB-028
Toluene	< 6.4 U	6.4	0	SB-029
Toluene	< 6.2 U	6.2	0	SB-029
Toluene	< 53 U	53	0	SB-030
Toluene	< 55 U	55	0	SB-030

Constituent	Original Data	Result	D_Result	Location ID
Toluene	< 53 U	53	0	SB-031
Toluene	< 5.3 U	5.3	0	SB-031
Toluene	< 5.3 UJ	5.3	0	SB-033
Toluene	< 5.3 U	5.3	0	SB-033
Toluene	< 5.4 UJ	5.4	0	SB-034
Toluene	< 5.6 UJ	5.6	0	SB-034
Toluene	< 5.5 UJ	5.5	0	SB-035
Toluene	< 5.2 UJ	5.2	0	SB-035
Toluene	< 5.5 UJ	5.5	0	SB-036
Toluene	< 6 UJ	6	0	SB-036
Toluene	< 5.6 UJ	5.6	0	SB-037
Toluene	< 6.1 UJ	6.1	0	SB-037
Toluene	< 5.7 U	5.7	0	SB-038
Toluene	< 6.6 UJ	6.6	0	SB-038
Toluene	< 5.9 U	5.9	0	SB-039
Toluene	< 30 U	30	0	SB-039
Toluene	< 5.7 U	5.7	0	SB-040
Toluene	< 6.3 U	6.3	0	SB-040
Toluene	< 6 U	6	0	SB-041
Toluene	< 5.8 U	5.8	0	SB-043
Toluene	< 6 U	6	0	SB-043
Toluene	< 6 U	6	0	SB-043A
Toluene	< 5.8 U	5.8	0	SB-044
Toluene	< 5.9 U	5.9	0	SB-044
Toluene	< 6 U	6	0	SB-046
Xylenes (total)	8200	8200	1	EB-E7 [Dpu]
Xylenes (total)	9500	9500	1	EB-E8
Xylenes (total)	64 [4600]	4600	1	EB-F5 [DUP]
Xylenes (total)	22000	22000	1	EB-F6
Xylenes (total)	11000	11000	1	EB-F7
Xylenes (total)	62000	62000	1	EB-F8
Xylenes (total)	12000	12000	1	EB-G6
Xylenes (total)	39000	39000	1	EB-G7
Xylenes (total)	4800 [1800]	4800	1	EB-G8 [DUP]
Xylenes (total)	25000	25000	1	EB-H5
Xylenes (total)	16000	16000	1	EB-H6
Xylenes (total)	9300	9300	1	EB-H7
Xylenes (total)	38000	38000	1	EB-H8
Xylenes (total)	29000	29000	1	EB-I6
Xylenes (total)	34000	34000	1	EB-I7
Xylenes (total)	28000 [--]	28000	1	EB-J6 [DUP]
Xylenes (total)	1400	1400	1	EB-J7
Xylenes (total)	13000	13000	1	EB-K6
Xylenes (total)	230000	230000	1	EB-K7
Xylenes (total)	44000	44000	1	EB-K8
Xylenes (total)	960	960	1	EB-L5
Xylenes (total)	2300	2300	1	EB-L6
Xylenes (total)	29000	29000	1	EB-L7
Xylenes (total)	51000	51000	1	EB-L8
Xylenes (total)	20000	20000	1	EW-E6-a
Xylenes (total)	130	130	1	EW-E6-b
Xylenes (total)	150000	150000	1	EW-E7-a
Xylenes (total)	100	100	1	EW-E8-a
Xylenes (total)	21	21	1	EW-G5-a
Xylenes (total)	100000	100000	1	EW-L8-B
Xylenes (total)	< 6 U	6	0	FTASB-04
Xylenes (total)	< 6 U	6	0	FTASB-04
Xylenes (total)	< 5 U	5	0	FTASB-06
Xylenes (total)	< 6 U	6	0	FTASB-06
Xylenes (total)	< 6 U	6	0	FTASB-09
Xylenes (total)	< 6 U	6	0	FTASB-09
Xylenes (total)	220000	220000	1	FTASB-10
Xylenes (total)	340	340	1	FTASB-11
Xylenes (total)	260000	260000	1	FTASB-12
Xylenes (total)	< 6 U	6	0	FTASB-13
Xylenes (total)	< 7 U	7	0	FTASB-13
Xylenes (total)	< 6 U	6	0	FTASB-14
Xylenes (total)	< 30 U	30	0	FTASB-14
Xylenes (total)	< 5 U	5	0	FTASB-15
Xylenes (total)	< 6 U	6	0	FTASB-15
Xylenes (total)	< 5 U	5	0	FTASB-16
Xylenes (total)	< 6 U	6	0	FTASB-16

Constituent	Original Data	Result	D_Result	Location ID
Xylenes (total)	< 5 U	5	0	FTASB-17
Xylenes (total)	< 6 U	6	0	FTASB-17
Xylenes (total)	3.5 J	3.5	1	HA01-MW-09
Xylenes (total)	3.2 J	3.2	1	HA01-MW-09
Xylenes (total)	< 8.8 U	8.8	0	HA01-MW-10
Xylenes (total)	< 6.8 U	6.8	0	HA01-MW-10
Xylenes (total)	< 6.7 U	6.7	0	HA01-MW-11
Xylenes (total)	< 5.8 U	5.8	0	HA01-MW-11
Xylenes (total)	< 5.1 U	5.1	0	A01-MW-11 (DUF
Xylenes (total)	< 6.9 U	6.9	0	HA01-MW-12
Xylenes (total)	< 5.8 U	5.8	0	HA01-MW-12
Xylenes (total)	< 6.9 U	6.9	0	HA01-MW-13
Xylenes (total)	< 5.6 U	5.6	0	HA01-MW-13
Xylenes (total)	< 6.2 U	6.2	0	HA01-MW-14
Xylenes (total)	< 5.9 U	5.9	0	HA01-MW-14
Xylenes (total)	< 6.3 U	6.3	0	HA01-MW-15
Xylenes (total)	< 6.9 U	6.9	0	HA01-MW-15
Xylenes (total)	< 5.4 U	5.4	0	HA01-MW-16
Xylenes (total)	12	12	1	HA01-MW-17
Xylenes (total)	< 5.8 U	5.8	0	HA01-MW-17
Xylenes (total)	< 6 U	6	0	HMW-10
Xylenes (total)	1 JQ	1	1	HMW-10
Xylenes (total)	< 6 U	6	0	HMW-11
Xylenes (total)	3100	3100	1	HMW-11
Xylenes (total)	2 JTH	2	1	HMW-12
Xylenes (total)	< 6 U	6	0	HMW-12
Xylenes (total)	310000	310000	1	HMW-13
Xylenes (total)	3100	3100	1	HMW-13
Xylenes (total)	< 5.7 U	5.7	0	HMW-14
Xylenes (total)	< 6 U	6	0	HMW-14
Xylenes (total)	< 5.2 U	5.2	0	HMW-14R
Xylenes (total)	< 5.4 U	5.4	0	HMW-14R
Xylenes (total)	< 7 U	7	0	HMW-15
Xylenes (total)	< 6.2 U	6.2	0	HMW-15
Xylenes (total)	< 6.2 U	6.2	0	HMW-16A
Xylenes (total)	< 6.5 U	6.5	0	HMW-16A
Xylenes (total)	< 6 U	6	0	HMW-17
Xylenes (total)	< 6.3 U	6.3	0	HMW-17
Xylenes (total)	< 6.4 U	6.4	0	HMW-18
Xylenes (total)	< 5.8 U	5.8	0	HMW-18
Xylenes (total)	< 1.1 U	1.1	0	HSB-1
Xylenes (total)	< 150 U	150	0	HSB-3
Xylenes (total)	< 1.2 U	1.2	0	HSB-4
Xylenes (total)	57000	57000	1	HSB-5
Xylenes (total)	< 1.2 U	1.2	0	HSB-6
Xylenes (total)	< 5.6 U	5.6	0	PSB-1
Xylenes (total)	200	200	1	PSB-1
Xylenes (total)	< 5.8 U	5.8	0	PSB-2
Xylenes (total)	< 5.8 U	5.8	0	PSB-2
Xylenes (total)	< 6 U	6	0	PSB-2
Xylenes (total)	< 6 U	6	0	PSB-2
Xylenes (total)	< 5.4 U	5.4	0	PSB-3
Xylenes (total)	< 5.7 U	5.7	0	PSB-3
Xylenes (total)	< 5.3 U	5.3	0	PSB-5
Xylenes (total)	< 5.8 U	5.8	0	PSB-5
Xylenes (total)	990	990	1	PSB-6
Xylenes (total)	< 5.7 U	5.7	0	PSB-7
Xylenes (total)	< 5.6 U	5.6	0	SB-018
Xylenes (total)	< 5.8 U	5.8	0	SB-018
Xylenes (total)	< 6.4 U	6.4	0	SB-019
Xylenes (total)	< 6.4 U	6.4	0	SB-019
Xylenes (total)	< 6.2 U	6.2	0	SB-020
Xylenes (total)	< 6.2 U	6.2	0	SB-020
Xylenes (total)	< 6.4 U	6.4	0	SB-021
Xylenes (total)	< 6.7 U	6.7	0	SB-021
Xylenes (total)	< 6.6 U	6.6	0	SB-022
Xylenes (total)	< 5.4 U	5.4	0	SB-022
Xylenes (total)	< 6.4 U	6.4	0	SB-023
Xylenes (total)	< 7.5 U	7.5	0	SB-023
Xylenes (total)	< 11 U	11	0	SB-024
Xylenes (total)	< 8.7 U	8.7	0	SB-024
Xylenes (total)	< 5.6 U	5.6	0	SB-025

Constituent	Original Data	Result	D_Result	Location ID
Xylenes (total)	< 6 U	6	0	SB-025
Xylenes (total)	< 6.9 U	6.9	0	SB-026
Xylenes (total)	< 6.5 U	6.5	0	SB-026
Xylenes (total)	< 6.5 U	6.5	0	SB-027
Xylenes (total)	28	28	1	SB-027
Xylenes (total)	< 6.7 U	6.7	0	SB-028
Xylenes (total)	< 6.1 U	6.1	0	SB-028
Xylenes (total)	< 6.4 U	6.4	0	SB-029
Xylenes (total)	< 6.2 U	6.2	0	SB-029
Xylenes (total)	< 53 U	53	0	SB-030
Xylenes (total)	< 55 U	55	0	SB-030
Xylenes (total)	< 53 U	53	0	SB-031
Xylenes (total)	< 5.3 U	5.3	0	SB-031
Xylenes (total)	< 5.3 U	5.3	0	SB-033
Xylenes (total)	< 5.3 U	5.3	0	SB-033
Xylenes (total)	< 5.4 U	5.4	0	SB-034
Xylenes (total)	< 5.6 U	5.6	0	SB-034
Xylenes (total)	< 5.5 U	5.5	0	SB-035
Xylenes (total)	< 5.2 U	5.2	0	SB-035
Xylenes (total)	< 5.5 U	5.5	0	SB-036
Xylenes (total)	< 6 U	6	0	SB-036
Xylenes (total)	< 5.6 U	5.6	0	SB-037
Xylenes (total)	< 6.1 U	6.1	0	SB-037
Xylenes (total)	< 5.7 U	5.7	0	SB-038
Xylenes (total)	< 6.6 UJ	6.6	0	SB-038
Xylenes (total)	< 5.9 U	5.9	0	SB-039
Xylenes (total)	< 30 U	30	0	SB-039
Xylenes (total)	< 5.7 U	5.7	0	SB-040
Xylenes (total)	< 6.3 U	6.3	0	SB-040
Xylenes (total)	< 6 U	6	0	SB-041
Xylenes (total)	< 12 U	12	0	SB-043
Xylenes (total)	< 12 U	12	0	SB-043
Xylenes (total)	< 12 U	12	0	SB-043A
Xylenes (total)	< 12 U	12	0	SB-044
Xylenes (total)	< 12 U	12	0	SB-044
Xylenes (total)	< 12 U	12	0	SB-046

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.14/18/2019 4:39:49 PM
From File	RI-FS Appendix A - ALL Soil Analytical Results_new criteria_SBO 4-2019.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result (1-methylnaphthalene)

General Statistics

Total Number of Observations	33	Number of Distinct Observations	26
		Number of Missing Observations	0
Minimum	480	Mean	12569
Maximum	40000	Median	9500
SD	9363	Std. Error of Mean	1630
Coefficient of Variation	0.745	Skewness	1.488

Normal GOF Test

Shapiro Wilk Test Statistic	0.836	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.233	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.152	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	15330	95% Adjusted-CLT UCL (Chen-1995)	15701
		95% Modified-t UCL (Johnson-1978)	15400

Gamma GOF Test

A-D Test Statistic	0.727	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.759	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.144	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.155	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.998	k star (bias corrected MLE)	1.837
Theta hat (MLE)	6290	Theta star (bias corrected MLE)	6843
nu hat (MLE)	131.9	nu star (bias corrected)	121.2
MLE Mean (bias corrected)	12569	MLE Sd (bias corrected)	9274
		Approximate Chi Square Value (0.05)	96.81
Adjusted Level of Significance	0.0419	Adjusted Chi Square Value	95.69

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	15740	95% Adjusted Gamma UCL (use when n<50)	15925

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.155	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.152	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.174	Mean of logged Data	9.168
Maximum of Logged Data	10.6	SD of logged Data	0.828

Assuming Lognormal Distribution

95% H-UCL	18757	90% Chebyshev (MVUE) UCL	19737
95% Chebyshev (MVUE) UCL	22642	97.5% Chebyshev (MVUE) UCL	26673
99% Chebyshev (MVUE) UCL	34591		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	15250	95% Jackknife UCL	15330
95% Standard Bootstrap UCL	15199	95% Bootstrap-t UCL	16105
95% Hall's Bootstrap UCL	15799	95% Percentile Bootstrap UCL	15281

95% BCA Bootstrap UCL	15948		
90% Chebyshev(Mean, Sd) UCL	17459	95% Chebyshev(Mean, Sd) UCL	19673
97.5% Chebyshev(Mean, Sd) UCL	22747	99% Chebyshev(Mean, Sd) UCL	28786

Suggested UCL to Use

95% Adjusted Gamma UCL 15925

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (2-methylnaphthalene)

General Statistics

Total Number of Observations	59	Number of Distinct Observations	43
Number of Detects	36	Number of Non-Detects	23
Number of Distinct Detects	31	Number of Distinct Non-Detects	12
Minimum Detect	280	Minimum Non-Detect	2
Maximum Detect	99000	Maximum Non-Detect	430
Variance Detects	3.624E+8	Percent Non-Detects	38.98%
Mean Detects	19386	SD Detects	19038
Median Detects	11500	CV Detects	0.982
Skewness Detects	2.367	Kurtosis Detects	7.788
Mean of Logged Detects	9.372	SD of Logged Detects	1.225

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.78	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	11853	KM Standard Error of Mean	2302
KM SD	17430	95% KM (BCA) UCL	15879
95% KM (t) UCL	15700	95% KM (Percentile Bootstrap) UCL	15794
95% KM (z) UCL	15639	95% KM Bootstrap t UCL	16969
90% KM Chebyshev UCL	18757	95% KM Chebyshev UCL	21885
97.5% KM Chebyshev UCL	26226	99% KM Chebyshev UCL	34753

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.516	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.774	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.106	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.151	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.137	k star (bias corrected MLE)	1.061
Theta hat (MLE)	17049	Theta star (bias corrected MLE)	18274
nu hat (MLE)	81.87	nu star (bias corrected)	76.38
Mean (detects)	19386		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	11828
Maximum	99000	Median	6900
SD	17597	CV	1.488
k hat (MLE)	0.142	k star (bias corrected MLE)	0.146
Theta hat (MLE)	83293	Theta star (bias corrected MLE)	80968
nu hat (MLE)	16.76	nu star (bias corrected)	17.24
Adjusted Level of Significance (β)	0.0459		
Approximate Chi Square Value (17.24, α)	8.843	Adjusted Chi Square Value (17.24, β)	8.692
95% Gamma Approximate UCL (use when n>=50)	23059	95% Gamma Adjusted UCL (use when n<50)	23459

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	11853	SD (KM)	17430
Variance (KM)	3.038E+8	SE of Mean (KM)	2302
k hat (KM)	0.462	k star (KM)	0.45
nu hat (KM)	54.56	nu star (KM)	53.12
theta hat (KM)	25633	theta star (KM)	26328
80% gamma percentile (KM)	19346	90% gamma percentile (KM)	32752
95% gamma percentile (KM)	47257	99% gamma percentile (KM)	83293

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (53.12, α)	37.38	Adjusted Chi Square Value (53.12, β)	37.05
95% Gamma Approximate KM-UCL (use when n>=50)	16845	95% Gamma Adjusted KM-UCL (use when n<50)	16996

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.881	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.935	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.165	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	12219	Mean in Log Scale	8.369
SD in Original Scale	17337	SD in Log Scale	1.611
95% t UCL (assumes normality of ROS data)	15991	95% Percentile Bootstrap UCL	15995
95% BCA Bootstrap UCL	16794	95% Bootstrap t UCL	17248
95% H-UCL (Log ROS)	31799		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	6.407	KM Geo Mean	606.4
KM SD (logged)	4.033	95% Critical H Value (KM-Log)	7.182
KM Standard Error of Mean (logged)	0.668	95% H-UCL (KM -Log)	92571168
KM SD (logged)	4.033	95% Critical H Value (KM-Log)	7.182
KM Standard Error of Mean (logged)	0.668		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	11895	Mean in Log Scale	7.625
SD in Original Scale	17551	SD in Log Scale	2.505
95% t UCL (Assumes normality)	15714	95% H-Stat UCL	232700

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	16845

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

PIKA ARCADIS a joint venture

Result (acenaphthene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	35
Number of Detects	5	Number of Non-Detects	99
Number of Distinct Detects	5	Number of Distinct Non-Detects	30
Minimum Detect	110	Minimum Non-Detect	71
Maximum Detect	2300	Maximum Non-Detect	85000
Variance Detects	950850	Percent Non-Detects	95.19%
Mean Detects	980	SD Detects	975.1
Median Detects	620	CV Detects	0.995
Skewness Detects	0.646	Kurtosis Detects	-2.021
Mean of Logged Detects	6.289	SD of Logged Detects	1.351

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.244	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	122.7	KM Standard Error of Mean	31.29
KM SD	276.6	95% KM (BCA) UCL	190
95% KM (t) UCL	174.6	95% KM (Percentile Bootstrap) UCL	175.6
95% KM (z) UCL	174.1	95% KM Bootstrap t UCL	193.7
90% KM Chebyshev UCL	216.5	95% KM Chebyshev UCL	259.1
97.5% KM Chebyshev UCL	318.1	99% KM Chebyshev UCL	434

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.333	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.692	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.234	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.365	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.968	k star (bias corrected MLE)	0.521
Theta hat (MLE)	1012	Theta star (bias corrected MLE)	1883
nu hat (MLE)	9.681	nu star (bias corrected)	5.206
Mean (detects)	980		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	47.12
Maximum	2300	Median	0.01
SD	285.1	CV	6.051
k hat (MLE)	0.102	k star (bias corrected MLE)	0.106
Theta hat (MLE)	461.6	Theta star (bias corrected MLE)	446.5
nu hat (MLE)	21.23	nu star (bias corrected)	21.96
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (21.96, α)	12.3	Adjusted Chi Square Value (21.96, β)	12.2
95% Gamma Approximate UCL (use when n>=50)	84.08	95% Gamma Adjusted UCL (use when n<50)	84.78

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	122.7	SD (KM)	276.6
Variance (KM)	76514	SE of Mean (KM)	31.29
k hat (KM)	0.197	k star (KM)	0.197
nu hat (KM)	40.91	nu star (KM)	41.06
theta hat (KM)	623.7	theta star (KM)	621.4
80% gamma percentile (KM)	160.5	90% gamma percentile (KM)	371
95% gamma percentile (KM)	634.2	99% gamma percentile (KM)	1360

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (41.06, α)	27.38	Adjusted Chi Square Value (41.06, β)	27.22
95% Gamma Approximate KM-UCL (use when n>=50)	184	95% Gamma Adjusted KM-UCL (use when n<50)	185.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.909	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	57.77	Mean in Log Scale	1.437
SD in Original Scale	284.1	SD in Log Scale	1.971
95% t UCL (assumes normality of ROS data)	104	95% Percentile Bootstrap UCL	112.2
95% BCA Bootstrap UCL	132.6	95% Bootstrap t UCL	240.3
95% H-UCL (Log ROS)	55.34		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.426	KM Geo Mean	83.63
KM SD (logged)	0.542	95% Critical H Value (KM-Log)	1.856
KM Standard Error of Mean (logged)	0.0798	95% H-UCL (KM -Log)	107
KM SD (logged)	0.542	95% Critical H Value (KM-Log)	1.856
KM Standard Error of Mean (logged)	0.0798		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	661.7	Mean in Log Scale	5.208
SD in Original Scale	4158	SD in Log Scale	0.95
95% t UCL (Assumes normality)	1338	95% H-Stat UCL	351.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 174.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (acenaphthylene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	42
Number of Detects	18	Number of Non-Detects	86
Number of Distinct Detects	17	Number of Distinct Non-Detects	29
Minimum Detect	110	Minimum Non-Detect	71
Maximum Detect	6600	Maximum Non-Detect	8400
Variance Detects	2645511	Percent Non-Detects	82.69%
Mean Detects	1211	SD Detects	1627
Median Detects	650	CV Detects	1.344
Skewness Detects	2.519	Kurtosis Detects	7.004
Mean of Logged Detects	6.426	SD of Logged Detects	1.2

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.683	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.249	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	292.7	KM Standard Error of Mean	80.42
KM SD	786.8	95% KM (BCA) UCL	441.4
95% KM (t) UCL	426.2	95% KM (Percentile Bootstrap) UCL	430.1
95% KM (z) UCL	425	95% KM Bootstrap t UCL	565.7
90% KM Chebyshev UCL	534	95% KM Chebyshev UCL	643.3
97.5% KM Chebyshev UCL	794.9	99% KM Chebyshev UCL	1093

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.444	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.772	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.114	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.21	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.873	k star (bias corrected MLE)	0.764
Theta hat (MLE)	1387	Theta star (bias corrected MLE)	1584
nu hat (MLE)	31.42	nu star (bias corrected)	27.51
Mean (detects)	1211		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	209.5
Maximum	6600	Median	0.01
SD	805.2	CV	3.843
k hat (MLE)	0.101	k star (bias corrected MLE)	0.104
Theta hat (MLE)	2077	Theta star (bias corrected MLE)	2007
nu hat (MLE)	20.98	nu star (bias corrected)	21.71
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (21.71, α)	12.12	Adjusted Chi Square Value (21.71, β)	12.02
95% Gamma Approximate UCL (use when n>=50)	375.3	95% Gamma Adjusted UCL (use when n<50)	378.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	292.7	SD (KM)	786.8
Variance (KM)	619116	SE of Mean (KM)	80.42
k hat (KM)	0.138	k star (KM)	0.141
nu hat (KM)	28.79	nu star (KM)	29.29
theta hat (KM)	2115	theta star (KM)	2079
80% gamma percentile (KM)	301.8	90% gamma percentile (KM)	859.5
95% gamma percentile (KM)	1630	99% gamma percentile (KM)	3896

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (29.29, α)	17.94	Adjusted Chi Square Value (29.29, β)	17.81
95% Gamma Approximate KM-UCL (use when n>=50)	478	95% Gamma Adjusted KM-UCL (use when n<50)	481.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.966	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.103	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	246.7	Mean in Log Scale	3.759
SD in Original Scale	797	SD in Log Scale	1.683
95% t UCL (assumes normality of ROS data)	376.4	95% Percentile Bootstrap UCL	391.3
95% BCA Bootstrap UCL	437.9	95% Bootstrap t UCL	521.6
95% H-UCL (Log ROS)	287.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.818	KM Geo Mean	123.7
KM SD (logged)	0.961	95% Critical H Value (KM-Log)	2.172
KM Standard Error of Mean (logged)	0.121	95% H-UCL (KM -Log)	241
KM SD (logged)	0.961	95% Critical H Value (KM-Log)	2.172
KM Standard Error of Mean (logged)	0.121		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	403.2	Mean in Log Scale	5.314
SD in Original Scale	862.9	SD in Log Scale	0.967
95% t UCL (Assumes normality)	543.6	95% H-Stat UCL	399.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	478

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (acetone)

General Statistics

Total Number of Observations	113	Number of Distinct Observations	49
Number of Detects	26	Number of Non-Detects	87
Number of Distinct Detects	18	Number of Distinct Non-Detects	33
Minimum Detect	36	Minimum Non-Detect	5.6
Maximum Detect	27000	Maximum Non-Detect	6000
Variance Detects	47023530	Percent Non-Detects	76.99%
Mean Detects	2399	SD Detects	6857
Median Detects	125	CV Detects	2.858
Skewness Detects	3.324	Kurtosis Detects	10.05
Mean of Logged Detects	5.537	SD of Logged Detects	1.841

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.377	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.4	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.17	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	561.6	KM Standard Error of Mean	324.3
KM SD	3379	95% KM (BCA) UCL	1216
95% KM (t) UCL	1099	95% KM (Percentile Bootstrap) UCL	1145
95% KM (z) UCL	1095	95% KM Bootstrap t UCL	4757
90% KM Chebyshev UCL	1534	95% KM Chebyshev UCL	1975
97.5% KM Chebyshev UCL	2587	99% KM Chebyshev UCL	3788

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.051	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.85	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.387	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.186	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.306	k star (bias corrected MLE)	0.296
Theta hat (MLE)	7838	Theta star (bias corrected MLE)	8094
nu hat (MLE)	15.92	nu star (bias corrected)	15.41
Mean (detects)	2399		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	552
Maximum	27000	Median	0.01
SD	3395	CV	6.15
k hat (MLE)	0.0952	k star (bias corrected MLE)	0.0986
Theta hat (MLE)	5799	Theta star (bias corrected MLE)	5601
nu hat (MLE)	21.51	nu star (bias corrected)	22.27
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (22.27, α)	12.54	Adjusted Chi Square Value (22.27, β)	12.45
95% Gamma Approximate UCL (use when n>=50)	980.2	95% Gamma Adjusted UCL (use when n<50)	987.6

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	561.6	SD (KM)	3379
Variance (KM)	11418390	SE of Mean (KM)	324.3
k hat (KM)	0.0276	k star (KM)	0.0328
nu hat (KM)	6.242	nu star (KM)	7.41
theta hat (KM)	20333	theta star (KM)	17129
80% gamma percentile (KM)	10.94	90% gamma percentile (KM)	406.3
95% gamma percentile (KM)	2349	99% gamma percentile (KM)	14144

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.41, α)	2.398	Adjusted Chi Square Value (7.41, β)	2.362
95% Gamma Approximate KM-UCL (use when n>=50)	1735	95% Gamma Adjusted KM-UCL (use when n<50)	1762

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.801	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.92	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.317	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.17	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	553.5	Mean in Log Scale	1.01
SD in Original Scale	3395	SD in Log Scale	3.009
95% t UCL (assumes normality of ROS data)	1083	95% Percentile Bootstrap UCL	1171
95% BCA Bootstrap UCL	1410	95% Bootstrap t UCL	4757
95% H-UCL (Log ROS)	947		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.721	KM Geo Mean	15.19
KM SD (logged)	1.844	95% Critical H Value (KM-Log)	3.132
KM Standard Error of Mean (logged)	0.189	95% H-UCL (KM -Log)	143.4
KM SD (logged)	1.844	95% Critical H Value (KM-Log)	3.132
KM Standard Error of Mean (logged)	0.189		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	634.4	Mean in Log Scale	3.772
SD in Original Scale	3400	SD in Log Scale	1.607
95% t UCL (Assumes normality)	1165	95% H-Stat UCL	243.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	1975

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (anthracene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	46
Number of Detects	23	Number of Non-Detects	81
Number of Distinct Detects	19	Number of Distinct Non-Detects	27
Minimum Detect	42	Minimum Non-Detect	71
Maximum Detect	7500	Maximum Non-Detect	85000
Variance Detects	5226450	Percent Non-Detects	77.88%
Mean Detects	1531	SD Detects	2286
Median Detects	300	CV Detects	1.493
Skewness Detects	1.902	Kurtosis Detects	2.681
Mean of Logged Detects	6.231	SD of Logged Detects	1.574

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.669	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.266	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	402.5	KM Standard Error of Mean	123.3
KM SD	1220	95% KM (BCA) UCL	661.2
95% KM (t) UCL	607.2	95% KM (Percentile Bootstrap) UCL	611.7
95% KM (z) UCL	605.3	95% KM Bootstrap t UCL	729.1
90% KM Chebyshev UCL	772.4	95% KM Chebyshev UCL	940
97.5% KM Chebyshev UCL	1173	99% KM Chebyshev UCL	1629

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.295	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.799	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.234	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.191	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.565	k star (bias corrected MLE)	0.521
Theta hat (MLE)	2708	Theta star (bias corrected MLE)	2941
nu hat (MLE)	26.01	nu star (bias corrected)	23.95
Mean (detects)	1531		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	355.8
Maximum	7500	Median	0.01
SD	1232	CV	3.464
k hat (MLE)	0.109	k star (bias corrected MLE)	0.113
Theta hat (MLE)	3256	Theta star (bias corrected MLE)	3162
nu hat (MLE)	22.73	nu star (bias corrected)	23.4
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (23.40, α)	13.4	Adjusted Chi Square Value (23.40, β)	13.29
95% Gamma Approximate UCL (use when n>=50)	621.5	95% Gamma Adjusted UCL (use when n<50)	626.5

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	402.5	SD (KM)	1220
Variance (KM)	1487907	SE of Mean (KM)	123.3
k hat (KM)	0.109	k star (KM)	0.112
nu hat (KM)	22.65	nu star (KM)	23.33
theta hat (KM)	3697	theta star (KM)	3589
80% gamma percentile (KM)	325.8	90% gamma percentile (KM)	1117
95% gamma percentile (KM)	2315	99% gamma percentile (KM)	6033

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (23.33, α)	13.34	Adjusted Chi Square Value (23.33, β)	13.23
95% Gamma Approximate KM-UCL (use when n>=50)	703.9	95% Gamma Adjusted KM-UCL (use when n<50)	709.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.914	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.212	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	386.5	Mean in Log Scale	4.064
SD in Original Scale	1223	SD in Log Scale	1.726
95% t UCL (assumes normality of ROS data)	585.6	95% Percentile Bootstrap UCL	606.4
95% BCA Bootstrap UCL	673.8	95% Bootstrap t UCL	717.1
95% H-UCL (Log ROS)	428.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.592	KM Geo Mean	98.68
KM SD (logged)	1.262	95% Critical H Value (KM-Log)	2.463
KM Standard Error of Mean (logged)	0.156	95% H-UCL (KM -Log)	297.1
KM SD (logged)	1.262	95% Critical H Value (KM-Log)	2.463
KM Standard Error of Mean (logged)	0.156		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	891.3	Mean in Log Scale	5.295
SD in Original Scale	4294	SD in Log Scale	1.225
95% t UCL (Assumes normality)	1590	95% H-Stat UCL	565.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	940

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benz(a)anthracene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	53
Number of Detects	31	Number of Non-Detects	73
Number of Distinct Detects	30	Number of Distinct Non-Detects	25
Minimum Detect	61	Minimum Non-Detect	62
Maximum Detect	34000	Maximum Non-Detect	5600
Variance Detects	58605813	Percent Non-Detects	70.19%
Mean Detects	4739	SD Detects	7655
Median Detects	840	CV Detects	1.615
Skewness Detects	2.337	Kurtosis Detects	6.274
Mean of Logged Detects	6.991	SD of Logged Detects	1.92

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.669	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.929	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.295	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.156	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1485	KM Standard Error of Mean	461.4
KM SD	4627	95% KM (BCA) UCL	2284
95% KM (t) UCL	2251	95% KM (Percentile Bootstrap) UCL	2266
95% KM (z) UCL	2244	95% KM Bootstrap t UCL	2756
90% KM Chebyshev UCL	2869	95% KM Chebyshev UCL	3496
97.5% KM Chebyshev UCL	4366	99% KM Chebyshev UCL	6076

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.217	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.823	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.179	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.168	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.44	k star (bias corrected MLE)	0.419
Theta hat (MLE)	10772	Theta star (bias corrected MLE)	11314
nu hat (MLE)	27.28	nu star (bias corrected)	25.97
Mean (detects)	4739		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1413
Maximum	34000	Median	0.01
SD	4671	CV	3.306
k hat (MLE)	0.097	k star (bias corrected MLE)	0.101
Theta hat (MLE)	14560	Theta star (bias corrected MLE)	14037
nu hat (MLE)	20.18	nu star (bias corrected)	20.93
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (20.93, α)	11.54	Adjusted Chi Square Value (20.93, β)	11.44
95% Gamma Approximate UCL (use when n>=50)	2562	95% Gamma Adjusted UCL (use when n<50)	2584

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1485	SD (KM)	4627
Variance (KM)	21411388	SE of Mean (KM)	461.4
k hat (KM)	0.103	k star (KM)	0.106
nu hat (KM)	21.42	nu star (KM)	22.14
theta hat (KM)	14418	theta star (KM)	13952
80% gamma percentile (KM)	1124	90% gamma percentile (KM)	4050
95% gamma percentile (KM)	8582	99% gamma percentile (KM)	22860

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.14, α)	12.44	Adjusted Chi Square Value (22.14, β)	12.34
95% Gamma Approximate KM-UCL (use when n>=50)	2642	95% Gamma Adjusted KM-UCL (use when n<50)	2664

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.929	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.121	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.156	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1467	Mean in Log Scale	4.616
SD in Original Scale	4655	SD in Log Scale	2.163
95% t UCL (assumes normality of ROS data)	2225	95% Percentile Bootstrap UCL	2232
95% BCA Bootstrap UCL	2466	95% Bootstrap t UCL	2625
95% H-UCL (Log ROS)	2213		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.207	KM Geo Mean	182.5
KM SD (logged)	1.615	95% Critical H Value (KM-Log)	2.847
KM Standard Error of Mean (logged)	0.177	95% H-UCL (KM -Log)	1058
KM SD (logged)	1.615	95% Critical H Value (KM-Log)	2.847
KM Standard Error of Mean (logged)	0.177		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1561	Mean in Log Scale	5.616
SD in Original Scale	4634	SD in Log Scale	1.502
95% t UCL (Assumes normality)	2315	95% H-Stat UCL	1271

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	1058

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzene)

General Statistics

Total Number of Observations	117	Number of Distinct Observations	62
Number of Detects	45	Number of Non-Detects	72
Number of Distinct Detects	39	Number of Distinct Non-Detects	28
Minimum Detect	2.8	Minimum Non-Detect	1.2
Maximum Detect	18000	Maximum Non-Detect	2500
Variance Detects	8797516	Percent Non-Detects	61.54%
Mean Detects	1454	SD Detects	2966
Median Detects	430	CV Detects	2.039
Skewness Detects	4.322	Kurtosis Detects	22.45
Mean of Logged Detects	5.607	SD of Logged Detects	2.212

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.518	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.131	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	569.1	KM Standard Error of Mean	182.6
KM SD	1951	95% KM (BCA) UCL	924.8
95% KM (t) UCL	871.9	95% KM (Percentile Bootstrap) UCL	903.9
95% KM (z) UCL	869.5	95% KM Bootstrap t UCL	1162
90% KM Chebyshev UCL	1117	95% KM Chebyshev UCL	1365
97.5% KM Chebyshev UCL	1710	99% KM Chebyshev UCL	2386

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.688	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.839	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.122	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.141	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.394	k star (bias corrected MLE)	0.382
Theta hat (MLE)	3693	Theta star (bias corrected MLE)	3803
nu hat (MLE)	35.45	nu star (bias corrected)	34.42
Mean (detects)	1454		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	559.4
Maximum	18000	Median	0.01
SD	1960	CV	3.504
k hat (MLE)	0.114	k star (bias corrected MLE)	0.117
Theta hat (MLE)	4907	Theta star (bias corrected MLE)	4790
nu hat (MLE)	26.68	nu star (bias corrected)	27.33
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (27.33, α)	16.4	Adjusted Chi Square Value (27.33, β)	16.3
95% Gamma Approximate UCL (use when n>=50)	931.8	95% Gamma Adjusted UCL (use when n<50)	937.8

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	569.1	SD (KM)	1951
Variance (KM)	3807117	SE of Mean (KM)	182.6
k hat (KM)	0.0851	k star (KM)	0.0886
nu hat (KM)	19.91	nu star (KM)	20.73
theta hat (KM)	6689	theta star (KM)	6424
80% gamma percentile (KM)	326.3	90% gamma percentile (KM)	1431
95% gamma percentile (KM)	3316	99% gamma percentile (KM)	9597

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (20.73, α)	11.39	Adjusted Chi Square Value (20.73, β)	11.31
95% Gamma Approximate KM-UCL (use when n>=50)	1036	95% Gamma Adjusted KM-UCL (use when n<50)	1044

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.945	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.131	Detected Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	561.6	Mean in Log Scale	2.18
SD in Original Scale	1959	SD in Log Scale	3.323
95% t UCL (assumes normality of ROS data)	862	95% Percentile Bootstrap UCL	884.4
95% BCA Bootstrap UCL	1046	95% Bootstrap t UCL	1180
95% H-UCL (Log ROS)	10523		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.51	KM Geo Mean	12.31
KM SD (logged)	2.902	95% Critical H Value (KM-Log)	4.496
KM Standard Error of Mean (logged)	0.298	95% H-UCL (KM -Log)	2786
KM SD (logged)	2.902	95% Critical H Value (KM-Log)	4.496
KM Standard Error of Mean (logged)	0.298		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	622.2	Mean in Log Scale	3.195
SD in Original Scale	1958	SD in Log Scale	2.747
95% t UCL (Assumes normality)	922.3	95% H-Stat UCL	3175

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	1036

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(a)pyrene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	49
Number of Detects	28	Number of Non-Detects	76
Number of Distinct Detects	26	Number of Distinct Non-Detects	26
Minimum Detect	81	Minimum Non-Detect	71
Maximum Detect	26000	Maximum Non-Detect	7900
Variance Detects	43711765	Percent Non-Detects	73.08%
Mean Detects	4518	SD Detects	6611
Median Detects	1200	CV Detects	1.464
Skewness Detects	2	Kurtosis Detects	3.761
Mean of Logged Detects	7.223	SD of Logged Detects	1.732

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.707	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.924	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.261	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.164	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1312	KM Standard Error of Mean	389.1
KM SD	3893	95% KM (BCA) UCL	2071
95% KM (t) UCL	1958	95% KM (Percentile Bootstrap) UCL	1989
95% KM (z) UCL	1952	95% KM Bootstrap t UCL	2340
90% KM Chebyshev UCL	2479	95% KM Chebyshev UCL	3008
97.5% KM Chebyshev UCL	3742	99% KM Chebyshev UCL	5183

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.804	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.807	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.176	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.175	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.528	k star (bias corrected MLE)	0.495
Theta hat (MLE)	8554	Theta star (bias corrected MLE)	9120
nu hat (MLE)	29.58	nu star (bias corrected)	27.74
Mean (detects)	4518		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1216
Maximum	26000	Median	0.01
SD	3939	CV	3.238
k hat (MLE)	0.0958	k star (bias corrected MLE)	0.0994
Theta hat (MLE)	12698	Theta star (bias corrected MLE)	12232
nu hat (MLE)	19.92	nu star (bias corrected)	20.68
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (20.68, α)	11.36	Adjusted Chi Square Value (20.68, β)	11.26
95% Gamma Approximate UCL (use when n>=50)	2215	95% Gamma Adjusted UCL (use when n<50)	2234

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1312	SD (KM)	3893
Variance (KM)	15152255	SE of Mean (KM)	389.1
k hat (KM)	0.114	k star (KM)	0.117
nu hat (KM)	23.64	nu star (KM)	24.29
theta hat (KM)	11548	theta star (KM)	11238
80% gamma percentile (KM)	1115	90% gamma percentile (KM)	3689
95% gamma percentile (KM)	7513	99% gamma percentile (KM)	19265

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (24.29, α)	14.07	Adjusted Chi Square Value (24.29, β)	13.96
95% Gamma Approximate KM-UCL (use when n>=50)	2265	95% Gamma Adjusted KM-UCL (use when n<50)	2283

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.924	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.122	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.164	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1278	Mean in Log Scale	4.63
SD in Original Scale	3920	SD in Log Scale	2.14
95% t UCL (assumes normality of ROS data)	1916	95% Percentile Bootstrap UCL	1939
95% BCA Bootstrap UCL	2099	95% Bootstrap t UCL	2301
95% H-UCL (Log ROS)	2105		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.382	KM Geo Mean	217.4
KM SD (logged)	1.49	95% Critical H Value (KM-Log)	2.707
KM Standard Error of Mean (logged)	0.175	95% H-UCL (KM -Log)	982.2
KM SD (logged)	1.49	95% Critical H Value (KM-Log)	2.707
KM Standard Error of Mean (logged)	0.175		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1394	Mean in Log Scale	5.722
SD in Original Scale	3903	SD in Log Scale	1.382
95% t UCL (Assumes normality)	2030	95% H-Stat UCL	1131

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	2265

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(b)fluoranthene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	47
Number of Detects	29	Number of Non-Detects	75
Number of Distinct Detects	27	Number of Distinct Non-Detects	24
Minimum Detect	110	Minimum Non-Detect	71
Maximum Detect	28000	Maximum Non-Detect	5600
Variance Detects	40540149	Percent Non-Detects	72.12%
Mean Detects	4803	SD Detects	6367
Median Detects	2000	CV Detects	1.326
Skewness Detects	2.128	Kurtosis Detects	5.387
Mean of Logged Detects	7.499	SD of Logged Detects	1.596

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.742	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.926	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.256	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.161	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1417	KM Standard Error of Mean	391.3
KM SD	3919	95% KM (BCA) UCL	2135
95% KM (t) UCL	2067	95% KM (Percentile Bootstrap) UCL	2099
95% KM (z) UCL	2061	95% KM Bootstrap t UCL	2421
90% KM Chebyshev UCL	2591	95% KM Chebyshev UCL	3123
97.5% KM Chebyshev UCL	3861	99% KM Chebyshev UCL	5310

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.526	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.797	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.131	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.171	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.628	k star (bias corrected MLE)	0.586
Theta hat (MLE)	7651	Theta star (bias corrected MLE)	8199
nu hat (MLE)	36.41	nu star (bias corrected)	33.97
Mean (detects)	4803		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1339
Maximum	28000	Median	0.01
SD	3963	CV	2.959
k hat (MLE)	0.0967	k star (bias corrected MLE)	0.1
Theta hat (MLE)	13844	Theta star (bias corrected MLE)	13345
nu hat (MLE)	20.12	nu star (bias corrected)	20.87
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (20.87, α)	11.5	Adjusted Chi Square Value (20.87, β)	11.4
95% Gamma Approximate UCL (use when n>=50)	2431	95% Gamma Adjusted UCL (use when n<50)	2452

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1417	SD (KM)	3919
Variance (KM)	15355079	SE of Mean (KM)	391.3
k hat (KM)	0.131	k star (KM)	0.133
nu hat (KM)	27.21	nu star (KM)	27.76
theta hat (KM)	10833	theta star (KM)	10619
80% gamma percentile (KM)	1390	90% gamma percentile (KM)	4120
95% gamma percentile (KM)	7965	99% gamma percentile (KM)	19409

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (27.76, α)	16.74	Adjusted Chi Square Value (27.76, β)	16.62
95% Gamma Approximate KM-UCL (use when n>=50)	2350	95% Gamma Adjusted KM-UCL (use when n<50)	2367

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.926	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.113	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.161	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1378	Mean in Log Scale	4.361
SD in Original Scale	3950	SD in Log Scale	2.446
95% t UCL (assumes normality of ROS data)	2021	95% Percentile Bootstrap UCL	2062
95% BCA Bootstrap UCL	2358	95% Bootstrap t UCL	2345
95% H-UCL (Log ROS)	3956		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.357	KM Geo Mean	212.1
KM SD (logged)	1.619	95% Critical H Value (KM-Log)	2.851
KM Standard Error of Mean (logged)	0.179	95% H-UCL (KM -Log)	1239
KM SD (logged)	1.619	95% Critical H Value (KM-Log)	2.851
KM Standard Error of Mean (logged)	0.179		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1499	Mean in Log Scale	5.776
SD in Original Scale	3919	SD in Log Scale	1.472
95% t UCL (Assumes normality)	2137	95% H-Stat UCL	1406

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	2350

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(ghi)perylene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	47
Number of Detects	22	Number of Non-Detects	82
Number of Distinct Detects	21	Number of Distinct Non-Detects	27
Minimum Detect	80	Minimum Non-Detect	71
Maximum Detect	14000	Maximum Non-Detect	9000
Variance Detects	16419151	Percent Non-Detects	78.85%
Mean Detects	3122	SD Detects	4052
Median Detects	1025	CV Detects	1.298
Skewness Detects	1.625	Kurtosis Detects	1.837
Mean of Logged Detects	7.11	SD of Logged Detects	1.536

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.748	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.911	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.255	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.184	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	734.3	KM Standard Error of Mean	221.6
KM SD	2204	95% KM (BCA) UCL	1156
95% KM (t) UCL	1102	95% KM (Percentile Bootstrap) UCL	1136
95% KM (z) UCL	1099	95% KM Bootstrap t UCL	1282
90% KM Chebyshev UCL	1399	95% KM Chebyshev UCL	1700
97.5% KM Chebyshev UCL	2118	99% KM Chebyshev UCL	2940

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.576	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.791	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.165	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.652	k star (bias corrected MLE)	0.594
Theta hat (MLE)	4786	Theta star (bias corrected MLE)	5259
nu hat (MLE)	28.7	nu star (bias corrected)	26.12
Mean (detects)	3122		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	660.3
Maximum	14000	Median	0.01
SD	2234	CV	3.382
k hat (MLE)	0.0948	k star (bias corrected MLE)	0.0985
Theta hat (MLE)	6963	Theta star (bias corrected MLE)	6703
nu hat (MLE)	19.73	nu star (bias corrected)	20.49
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (20.49, α)	11.21	Adjusted Chi Square Value (20.49, β)	11.12
95% Gamma Approximate UCL (use when n>=50)	1207	95% Gamma Adjusted UCL (use when n<50)	1217

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	734.3	SD (KM)	2204
Variance (KM)	4859091	SE of Mean (KM)	221.6
k hat (KM)	0.111	k star (KM)	0.114
nu hat (KM)	23.08	nu star (KM)	23.75
theta hat (KM)	6618	theta star (KM)	6432
80% gamma percentile (KM)	607.5	90% gamma percentile (KM)	2050
95% gamma percentile (KM)	4215	99% gamma percentile (KM)	10906

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (23.75, α)	13.66	Adjusted Chi Square Value (23.75, β)	13.55
95% Gamma Approximate KM-UCL (use when n>=50)	1277	95% Gamma Adjusted KM-UCL (use when n<50)	1287

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.911	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.111	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.184	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	690	Mean in Log Scale	3.683
SD in Original Scale	2225	SD in Log Scale	2.302
95% t UCL (assumes normality of ROS data)	1052	95% Percentile Bootstrap UCL	1062
95% BCA Bootstrap UCL	1151	95% Bootstrap t UCL	1238
95% H-UCL (Log ROS)	1294		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.996	KM Geo Mean	147.8
KM SD (logged)	1.331	95% Critical H Value (KM-Log)	2.535
KM Standard Error of Mean (logged)	0.149	95% H-UCL (KM -Log)	499.6
KM SD (logged)	1.331	95% Critical H Value (KM-Log)	2.535
KM Standard Error of Mean (logged)	0.149		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	852.8	Mean in Log Scale	5.537
SD in Original Scale	2222	SD in Log Scale	1.243
95% t UCL (Assumes normality)	1214	95% H-Stat UCL	742.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	1277

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(k)fluoranthene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	37
Number of Detects	14	Number of Non-Detects	90
Number of Distinct Detects	13	Number of Distinct Non-Detects	25
Minimum Detect	150	Minimum Non-Detect	71
Maximum Detect	27000	Maximum Non-Detect	5600
Variance Detects	57519985	Percent Non-Detects	86.54%
Mean Detects	7170	SD Detects	7584
Median Detects	5250	CV Detects	1.058
Skewness Detects	1.418	Kurtosis Detects	2.398
Mean of Logged Detects	7.96	SD of Logged Detects	1.776

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.852	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1046	KM Standard Error of Mean	367.5
KM SD	3610	95% KM (BCA) UCL	1719
95% KM (t) UCL	1656	95% KM (Percentile Bootstrap) UCL	1657
95% KM (z) UCL	1651	95% KM Bootstrap t UCL	1944
90% KM Chebyshev UCL	2149	95% KM Chebyshev UCL	2648
97.5% KM Chebyshev UCL	3341	99% KM Chebyshev UCL	4703

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.376	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.778	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.141	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.239	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.664	k star (bias corrected MLE)	0.569
Theta hat (MLE)	10804	Theta star (bias corrected MLE)	12600
nu hat (MLE)	18.58	nu star (bias corrected)	15.93
Mean (detects)	7170		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	965.2
Maximum	27000	Median	0.01
SD	3648	CV	3.779
k hat (MLE)	0.0847	k star (bias corrected MLE)	0.0886
Theta hat (MLE)	11398	Theta star (bias corrected MLE)	10888
nu hat (MLE)	17.61	nu star (bias corrected)	18.44
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (18.44, α)	9.709	Adjusted Chi Square Value (18.44, β)	9.62
95% Gamma Approximate UCL (use when n>=50)	1833	95% Gamma Adjusted UCL (use when n<50)	1850

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1046	SD (KM)	3610
Variance (KM)	13029052	SE of Mean (KM)	367.5
k hat (KM)	0.084	k star (KM)	0.088
nu hat (KM)	17.47	nu star (KM)	18.3
theta hat (KM)	12455	theta star (KM)	11891
80% gamma percentile (KM)	592.6	90% gamma percentile (KM)	2621
95% gamma percentile (KM)	6095	99% gamma percentile (KM)	17701

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (18.30, α)	9.607	Adjusted Chi Square Value (18.30, β)	9.518
95% Gamma Approximate KM-UCL (use when n>=50)	1992	95% Gamma Adjusted KM-UCL (use when n<50)	2011

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.19	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	999.2	Mean in Log Scale	2.823
SD in Original Scale	3639	SD in Log Scale	2.861
95% t UCL (assumes normality of ROS data)	1592	95% Percentile Bootstrap UCL	1651
95% BCA Bootstrap UCL	1899	95% Bootstrap t UCL	2010
95% H-UCL (Log ROS)	3480		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.916	KM Geo Mean	136.5
KM SD (logged)	1.399	95% Critical H Value (KM-Log)	2.607
KM Standard Error of Mean (logged)	0.168	95% H-UCL (KM -Log)	520.1
KM SD (logged)	1.399	95% Critical H Value (KM-Log)	2.607
KM Standard Error of Mean (logged)	0.168		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1154	Mean in Log Scale	5.524
SD in Original Scale	3609	SD in Log Scale	1.277
95% t UCL (Assumes normality)	1741	95% H-Stat UCL	774.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1656

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (bis(2-ethylhexyl)phthalate)

General Statistics

Total Number of Observations	88	Number of Distinct Observations	35
Number of Detects	23	Number of Non-Detects	65
Number of Distinct Detects	20	Number of Distinct Non-Detects	20
Minimum Detect	86	Minimum Non-Detect	3
Maximum Detect	2000	Maximum Non-Detect	3500
Variance Detects	248881	Percent Non-Detects	73.86%
Mean Detects	437.1	SD Detects	498.9
Median Detects	290	CV Detects	1.141
Skewness Detects	2.336	Kurtosis Detects	5.026
Mean of Logged Detects	5.659	SD of Logged Detects	0.885

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.658	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.332	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	218.4	KM Standard Error of Mean	38.01
KM SD	297.6	95% KM (BCA) UCL	293.4
95% KM (t) UCL	281.6	95% KM (Percentile Bootstrap) UCL	287.5
95% KM (z) UCL	280.9	95% KM Bootstrap t UCL	294.6
90% KM Chebyshev UCL	332.4	95% KM Chebyshev UCL	384
97.5% KM Chebyshev UCL	455.7	99% KM Chebyshev UCL	596.6

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.041	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.763	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.218	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.186	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.329	k star (bias corrected MLE)	1.184
Theta hat (MLE)	329	Theta star (bias corrected MLE)	369
nu hat (MLE)	61.13	nu star (bias corrected)	54.49
Mean (detects)	437.1		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	178.3
Maximum	2000	Median	88
SD	310	CV	1.739
k hat (MLE)	0.227	k star (bias corrected MLE)	0.226
Theta hat (MLE)	787	Theta star (bias corrected MLE)	787.5
nu hat (MLE)	39.87	nu star (bias corrected)	39.85
Adjusted Level of Significance (β)	0.0473		
Approximate Chi Square Value (39.85, α)	26.38	Adjusted Chi Square Value (39.85, β)	26.2
95% Gamma Approximate UCL (use when n>=50)	269.3	95% Gamma Adjusted UCL (use when n<50)	271.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	218.4	SD (KM)	297.6
Variance (KM)	88551	SE of Mean (KM)	38.01
k hat (KM)	0.538	k star (KM)	0.528
nu hat (KM)	94.77	nu star (KM)	92.87
theta hat (KM)	405.5	theta star (KM)	413.8
80% gamma percentile (KM)	359.3	90% gamma percentile (KM)	584.1
95% gamma percentile (KM)	822.8	99% gamma percentile (KM)	1407

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (92.87, α)	71.65	Adjusted Chi Square Value (92.87, β)	71.34
95% Gamma Approximate KM-UCL (use when n>=50)	283	95% Gamma Adjusted KM-UCL (use when n<50)	284.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.914	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.15	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	215.5	Mean in Log Scale	5.004
SD in Original Scale	290.4	SD in Log Scale	0.768
95% t UCL (assumes normality of ROS data)	266.9	95% Percentile Bootstrap UCL	271.4
95% BCA Bootstrap UCL	287.5	95% Bootstrap t UCL	316.9
95% H-UCL (Log ROS)	237		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.58	KM Geo Mean	97.48
KM SD (logged)	1.66	95% Critical H Value (KM-Log)	2.962
KM Standard Error of Mean (logged)	0.366	95% H-UCL (KM -Log)	654.5
KM SD (logged)	1.66	95% Critical H Value (KM-Log)	2.962
KM Standard Error of Mean (logged)	0.366		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	282.1	Mean in Log Scale	5.321
SD in Original Scale	331.2	SD in Log Scale	0.824
95% t UCL (Assumes normality)	340.7	95% H-Stat UCL	345.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	654.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (chromium)

General Statistics

Total Number of Observations	75	Number of Distinct Observations	63
		Number of Missing Observations	0
Minimum	0.00284	Mean	4380
Maximum	31700	Median	3680
SD	3857	Std. Error of Mean	445.3
Coefficient of Variation	0.881	Skewness	4.984

Normal GOF Test

Shapiro Wilk Test Statistic	0.62	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.102	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	5121	95% Adjusted-CLT UCL (Chen-1995)	5386
		95% Modified-t UCL (Johnson-1978)	5164

Gamma GOF Test

A-D Test Statistic	3.158	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.77	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.18	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.105	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.488	k star (bias corrected MLE)	1.437
Theta hat (MLE)	2944	Theta star (bias corrected MLE)	3048
nu hat (MLE)	223.1	nu star (bias corrected)	215.6
MLE Mean (bias corrected)	4380	MLE Sd (bias corrected)	3654
		Approximate Chi Square Value (0.05)	182.6
Adjusted Level of Significance	0.0468	Adjusted Chi Square Value	182

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	5171	95% Adjusted Gamma UCL (use when n<50)	5188

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.413	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.303	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.102	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-5.864	Mean of logged Data	8.012
Maximum of Logged Data	10.36	SD of logged Data	1.731

Assuming Lognormal Distribution

95% H-UCL	25095	90% Chebyshev (MVUE) UCL	24044
95% Chebyshev (MVUE) UCL	29103	97.5% Chebyshev (MVUE) UCL	36123
99% Chebyshev (MVUE) UCL	49914		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	5112	95% Jackknife UCL	5121
95% Standard Bootstrap UCL	5087	95% Bootstrap-t UCL	5570
95% Hall's Bootstrap UCL	8594	95% Percentile Bootstrap UCL	5214
95% BCA Bootstrap UCL	5471		
90% Chebyshev(Mean, Sd) UCL	5716	95% Chebyshev(Mean, Sd) UCL	6321
97.5% Chebyshev(Mean, Sd) UCL	7161	99% Chebyshev(Mean, Sd) UCL	8811

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 6321

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (chrysene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	46
Number of Detects	31	Number of Non-Detects	73
Number of Distinct Detects	28	Number of Distinct Non-Detects	22
Minimum Detect	55	Minimum Non-Detect	71
Maximum Detect	33000	Maximum Non-Detect	5600
Variance Detects	55990719	Percent Non-Detects	70.19%
Mean Detects	4660	SD Detects	7483
Median Detects	830	CV Detects	1.606
Skewness Detects	2.357	Kurtosis Detects	6.21
Mean of Logged Detects	7.06	SD of Logged Detects	1.856

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.67	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.929	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.289	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.156	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1456	KM Standard Error of Mean	451.7
KM SD	4530	95% KM (BCA) UCL	2304
95% KM (t) UCL	2206	95% KM (Percentile Bootstrap) UCL	2226
95% KM (z) UCL	2199	95% KM Bootstrap t UCL	2696
90% KM Chebyshev UCL	2811	95% KM Chebyshev UCL	3425
97.5% KM Chebyshev UCL	4277	99% KM Chebyshev UCL	5950

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.064	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.818	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.189	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.168	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.463	k star (bias corrected MLE)	0.44
Theta hat (MLE)	10053	Theta star (bias corrected MLE)	10587
nu hat (MLE)	28.74	nu star (bias corrected)	27.29
Mean (detects)	4660		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1389
Maximum	33000	Median	0.01
SD	4571	CV	3.291
k hat (MLE)	0.0974	k star (bias corrected MLE)	0.101
Theta hat (MLE)	14258	Theta star (bias corrected MLE)	13750
nu hat (MLE)	20.26	nu star (bias corrected)	21.01
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (21.01, α)	11.6	Adjusted Chi Square Value (21.01, β)	11.5
95% Gamma Approximate UCL (use when n>=50)	2516	95% Gamma Adjusted UCL (use when n<50)	2537

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1456	SD (KM)	4530
Variance (KM)	20518581	SE of Mean (KM)	451.7
k hat (KM)	0.103	k star (KM)	0.107
nu hat (KM)	21.48	nu star (KM)	22.2
theta hat (KM)	14094	theta star (KM)	13641
80% gamma percentile (KM)	1106	90% gamma percentile (KM)	3974
95% gamma percentile (KM)	8411	99% gamma percentile (KM)	22380

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.20, α)	12.49	Adjusted Chi Square Value (22.20, β)	12.38
95% Gamma Approximate KM-UCL (use when n>=50)	2588	95% Gamma Adjusted KM-UCL (use when n<50)	2609

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.947	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.929	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.115	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.156	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1437	Mean in Log Scale	4.548
SD in Original Scale	4557	SD in Log Scale	2.225
95% t UCL (assumes normality of ROS data)	2178	95% Percentile Bootstrap UCL	2237
95% BCA Bootstrap UCL	2456	95% Bootstrap t UCL	2702
95% H-UCL (Log ROS)	2458		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.175	KM Geo Mean	176.9
KM SD (logged)	1.64	95% Critical H Value (KM-Log)	2.875
KM Standard Error of Mean (logged)	0.183	95% H-UCL (KM -Log)	1080
KM SD (logged)	1.64	95% Critical H Value (KM-Log)	2.875
KM Standard Error of Mean (logged)	0.183		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1538	Mean in Log Scale	5.659
SD in Original Scale	4534	SD in Log Scale	1.47
95% t UCL (Assumes normality)	2276	95% H-Stat UCL	1247

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	1080

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (ddd)

General Statistics

Total Number of Observations	20	Number of Distinct Observations	13
Number of Detects	11	Number of Non-Detects	9
Number of Distinct Detects	10	Number of Distinct Non-Detects	3
Minimum Detect	4.2	Minimum Non-Detect	1.8
Maximum Detect	15	Maximum Non-Detect	2
Variance Detects	10.8	Percent Non-Detects	45%
Mean Detects	8.418	SD Detects	3.286
Median Detects	8.5	CV Detects	0.39
Skewness Detects	0.629	Kurtosis Detects	0.132
Mean of Logged Detects	2.06	SD of Logged Detects	0.4

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.157	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.44	KM Standard Error of Mean	0.945
KM SD	4.03	95% KM (BCA) UCL	7.13
95% KM (t) UCL	7.074	95% KM (Percentile Bootstrap) UCL	7.04
95% KM (z) UCL	6.995	95% KM Bootstrap t UCL	7.246
90% KM Chebyshev UCL	8.275	95% KM Chebyshev UCL	9.56
97.5% KM Chebyshev UCL	11.34	99% KM Chebyshev UCL	14.84

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.204	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.114	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.256	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.221	k star (bias corrected MLE)	5.312
Theta hat (MLE)	1.166	Theta star (bias corrected MLE)	1.585
nu hat (MLE)	158.9	nu star (bias corrected)	116.9
Mean (detects)	8.418		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.168
Maximum	15	Median	4.25
SD	4.451	CV	0.861
k hat (MLE)	0.58	k star (bias corrected MLE)	0.526
Theta hat (MLE)	8.915	Theta star (bias corrected MLE)	9.824
nu hat (MLE)	23.19	nu star (bias corrected)	21.04
Adjusted Level of Significance (β)	0.038		
Approximate Chi Square Value (21.04, α)	11.63	Adjusted Chi Square Value (21.04, β)	11.07
95% Gamma Approximate UCL (use when n>=50)	9.356	95% Gamma Adjusted UCL (use when n<50)	9.823

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.44	SD (KM)	4.03
Variance (KM)	16.24	SE of Mean (KM)	0.945
k hat (KM)	1.822	k star (KM)	1.582
nu hat (KM)	72.89	nu star (KM)	63.29
theta hat (KM)	2.985	theta star (KM)	3.438
80% gamma percentile (KM)	8.367	90% gamma percentile (KM)	11.19
95% gamma percentile (KM)	13.92	99% gamma percentile (KM)	20.07

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (63.29, α)	45.99	Adjusted Chi Square Value (63.29, β)	44.82
95% Gamma Approximate KM-UCL (use when n>=50)	7.487	95% Gamma Adjusted KM-UCL (use when n<50)	7.681

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.874	Mean in Log Scale	1.578
SD in Original Scale	3.769	SD in Log Scale	0.641
95% t UCL (assumes normality of ROS data)	7.331	95% Percentile Bootstrap UCL	7.26
95% BCA Bootstrap UCL	7.378	95% Bootstrap t UCL	7.555
95% H-UCL (Log ROS)	8.178		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.397	KM Geo Mean	4.044
KM SD (logged)	0.785	95% Critical H Value (KM-Log)	2.34
KM Standard Error of Mean (logged)	0.184	95% H-UCL (KM -Log)	8.389
KM SD (logged)	0.785	95% Critical H Value (KM-Log)	2.34
KM Standard Error of Mean (logged)	0.184		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.053	Mean in Log Scale	1.104
SD in Original Scale	4.501	SD in Log Scale	1.122
95% t UCL (Assumes normality)	6.793	95% H-Stat UCL	11.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	7.074

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (dde, p,p'-)

General Statistics

Total Number of Observations	19	Number of Distinct Observations	13
Number of Detects	10	Number of Non-Detects	9
Number of Distinct Detects	10	Number of Distinct Non-Detects	3
Minimum Detect	3.2	Minimum Non-Detect	1.8
Maximum Detect	24	Maximum Non-Detect	2
Variance Detects	47.95	Percent Non-Detects	47.37%
Mean Detects	10.54	SD Detects	6.924
Median Detects	8.5	CV Detects	0.657
Skewness Detects	0.911	Kurtosis Detects	-0.117
Mean of Logged Detects	2.156	SD of Logged Detects	0.675

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	6.4	KM Standard Error of Mean	1.563
KM SD	6.462	95% KM (BCA) UCL	9.195
95% KM (t) UCL	9.11	95% KM (Percentile Bootstrap) UCL	8.774
95% KM (z) UCL	8.97	95% KM Bootstrap t UCL	9.984
90% KM Chebyshev UCL	11.09	95% KM Chebyshev UCL	13.21
97.5% KM Chebyshev UCL	16.16	99% KM Chebyshev UCL	21.95

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.222	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.142	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.67	k star (bias corrected MLE)	1.936
Theta hat (MLE)	3.948	Theta star (bias corrected MLE)	5.445
nu hat (MLE)	53.4	nu star (bias corrected)	38.71
Mean (detects)	10.54		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.552
Maximum	24	Median	3.2
SD	7.291	CV	1.313
k hat (MLE)	0.256	k star (bias corrected MLE)	0.251
Theta hat (MLE)	21.67	Theta star (bias corrected MLE)	22.13
nu hat (MLE)	9.738	nu star (bias corrected)	9.534
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (9.53, α)	3.653	Adjusted Chi Square Value (9.53, β)	3.34
95% Gamma Approximate UCL (use when n>=50)	14.49	95% Gamma Adjusted UCL (use when n<50)	15.85

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	6.4	SD (KM)	6.462
Variance (KM)	41.76	SE of Mean (KM)	1.563
k hat (KM)	0.981	k star (KM)	0.861
nu hat (KM)	37.28	nu star (KM)	32.72
theta hat (KM)	6.524	theta star (KM)	7.432
80% gamma percentile (KM)	10.41	90% gamma percentile (KM)	15.29
95% gamma percentile (KM)	20.22	99% gamma percentile (KM)	31.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (32.72, α)	20.65	Adjusted Chi Square Value (32.72, β)	19.81
95% Gamma Approximate KM-UCL (use when n>=50)	10.14	95% Gamma Adjusted KM-UCL (use when n<50)	10.57

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.224	Mean in Log Scale	1.261
SD in Original Scale	6.782	SD in Log Scale	1.123
95% t UCL (assumes normality of ROS data)	8.921	95% Percentile Bootstrap UCL	8.992
95% BCA Bootstrap UCL	9.537	95% Bootstrap t UCL	10.09
95% H-UCL (Log ROS)	13.88		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.413	KM Geo Mean	4.11
KM SD (logged)	0.91	95% Critical H Value (KM-Log)	2.486
KM Standard Error of Mean (logged)	0.22	95% H-UCL (KM -Log)	10.61
KM SD (logged)	0.91	95% Critical H Value (KM-Log)	2.486
KM Standard Error of Mean (logged)	0.22		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.992	Mean in Log Scale	1.105
SD in Original Scale	6.945	SD in Log Scale	1.235
95% t UCL (Assumes normality)	8.755	95% H-Stat UCL	15.33

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 9.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (dibenz(a,h)anthracene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	38
Number of Detects	11	Number of Non-Detects	93
Number of Distinct Detects	11	Number of Distinct Non-Detects	29
Minimum Detect	91	Minimum Non-Detect	63
Maximum Detect	4200	Maximum Non-Detect	9000
Variance Detects	2527384	Percent Non-Detects	89.42%
Mean Detects	1405	SD Detects	1590
Median Detects	470	CV Detects	1.132
Skewness Detects	1	Kurtosis Detects	-0.746
Mean of Logged Detects	6.499	SD of Logged Detects	1.369

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.783	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.27	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	227.3	KM Standard Error of Mean	67.59
KM SD	644.2	95% KM (BCA) UCL	351.5
95% KM (t) UCL	339.5	95% KM (Percentile Bootstrap) UCL	343.4
95% KM (z) UCL	338.5	95% KM Bootstrap t UCL	421.7
90% KM Chebyshev UCL	430.1	95% KM Chebyshev UCL	521.9
97.5% KM Chebyshev UCL	649.4	99% KM Chebyshev UCL	899.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.531	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.21	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.264	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.793	k star (bias corrected MLE)	0.638
Theta hat (MLE)	1771	Theta star (bias corrected MLE)	2203
nu hat (MLE)	17.45	nu star (bias corrected)	14.03
Mean (detects)	1405		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	149.2
Maximum	4200	Median	0.01
SD	658.5	CV	4.414
k hat (MLE)	0.0981	k star (bias corrected MLE)	0.102
Theta hat (MLE)	1521	Theta star (bias corrected MLE)	1467
nu hat (MLE)	20.4	nu star (bias corrected)	21.14
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (21.14, α)	11.7	Adjusted Chi Square Value (21.14, β)	11.6
95% Gamma Approximate UCL (use when n>=50)	269.6	95% Gamma Adjusted UCL (use when n<50)	271.9

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	227.3	SD (KM)	644.2
Variance (KM)	415055	SE of Mean (KM)	67.59
k hat (KM)	0.124	k star (KM)	0.127
nu hat (KM)	25.89	nu star (KM)	26.48
theta hat (KM)	1826	theta star (KM)	1786
80% gamma percentile (KM)	212.5	90% gamma percentile (KM)	653.8
95% gamma percentile (KM)	1287	99% gamma percentile (KM)	3191

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (26.48, α)	15.75	Adjusted Chi Square Value (26.48, β)	15.63
95% Gamma Approximate KM-UCL (use when n>=50)	382.2	95% Gamma Adjusted KM-UCL (use when n<50)	385

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.145	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	175.8	Mean in Log Scale	2.968
SD in Original Scale	653.8	SD in Log Scale	1.844
95% t UCL (assumes normality of ROS data)	282.2	95% Percentile Bootstrap UCL	289
95% BCA Bootstrap UCL	324	95% Bootstrap t UCL	353.4
95% H-UCL (Log ROS)	187.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.576	KM Geo Mean	97.11
KM SD (logged)	0.881	95% Critical H Value (KM-Log)	2.103
KM Standard Error of Mean (logged)	0.131	95% H-UCL (KM -Log)	171.8
KM SD (logged)	0.881	95% Critical H Value (KM-Log)	2.103
KM Standard Error of Mean (logged)	0.131		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	375.7	Mean in Log Scale	5.288
SD in Original Scale	767.1	SD in Log Scale	0.911
95% t UCL (Assumes normality)	500.5	95% H-Stat UCL	362.6

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	382.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (dibenzofuran)

General Statistics

Total Number of Observations	30	Number of Distinct Observations	19
Number of Detects	7	Number of Non-Detects	23
Number of Distinct Detects	6	Number of Distinct Non-Detects	13
Minimum Detect	82	Minimum Non-Detect	71
Maximum Detect	2300	Maximum Non-Detect	430
Variance Detects	586474	Percent Non-Detects	76.67%
Mean Detects	720.3	SD Detects	765.8
Median Detects	660	CV Detects	1.063
Skewness Detects	1.765	Kurtosis Detects	3.494
Mean of Logged Detects	6.069	SD of Logged Detects	1.155

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.806	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.246	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	251.8	KM Standard Error of Mean	87.79
KM SD	432.3	95% KM (BCA) UCL	398
95% KM (t) UCL	401	95% KM (Percentile Bootstrap) UCL	405.4
95% KM (z) UCL	396.2	95% KM Bootstrap t UCL	494.9
90% KM Chebyshev UCL	515.2	95% KM Chebyshev UCL	634.5
97.5% KM Chebyshev UCL	800	99% KM Chebyshev UCL	1125

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.257	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.726	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.169	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.319	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.115	k star (bias corrected MLE)	0.733
Theta hat (MLE)	645.8	Theta star (bias corrected MLE)	983.2
nu hat (MLE)	15.62	nu star (bias corrected)	10.26
Mean (detects)	720.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	176.4
Maximum	2300	Median	0.01
SD	464.6	CV	2.634
k hat (MLE)	0.119	k star (bias corrected MLE)	0.129
Theta hat (MLE)	1483	Theta star (bias corrected MLE)	1364
nu hat (MLE)	7.137	nu star (bias corrected)	7.757
Adjusted Level of Significance (β)	0.041		
Approximate Chi Square Value (7.76, α)	2.595	Adjusted Chi Square Value (7.76, β)	2.426
95% Gamma Approximate UCL (use when n>=50)	527.3	95% Gamma Adjusted UCL (use when n<50)	564.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	251.8	SD (KM)	432.3
Variance (KM)	186856	SE of Mean (KM)	87.79
k hat (KM)	0.339	k star (KM)	0.328
nu hat (KM)	20.36	nu star (KM)	19.66
theta hat (KM)	742.1	theta star (KM)	768.6
80% gamma percentile (KM)	393.8	90% gamma percentile (KM)	734.2
95% gamma percentile (KM)	1119	99% gamma percentile (KM)	2110

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (19.66, α)	10.6	Adjusted Chi Square Value (19.66, β)	10.22
95% Gamma Approximate KM-UCL (use when n>=50)	467	95% Gamma Adjusted KM-UCL (use when n<50)	484.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.965	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.215	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	217.8	Mean in Log Scale	4.421
SD in Original Scale	450.1	SD in Log Scale	1.241
95% t UCL (assumes normality of ROS data)	357.4	95% Percentile Bootstrap UCL	370.7
95% BCA Bootstrap UCL	444.2	95% Bootstrap t UCL	558.9
95% H-UCL (Log ROS)	342.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.925	KM Geo Mean	137.7
KM SD (logged)	0.905	95% Critical H Value (KM-Log)	2.361
KM Standard Error of Mean (logged)	0.237	95% H-UCL (KM -Log)	308.4
KM SD (logged)	0.905	95% Critical H Value (KM-Log)	2.361
KM Standard Error of Mean (logged)	0.237		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	299.6	Mean in Log Scale	5.283
SD in Original Scale	423.4	SD in Log Scale	0.839
95% t UCL (Assumes normality)	430.9	95% H-Stat UCL	399.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	401

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (ethylbenzene)

General Statistics

Total Number of Observations	158	Number of Distinct Observations	64
Number of Detects	45	Number of Non-Detects	113
Number of Distinct Detects	35	Number of Distinct Non-Detects	30
Minimum Detect	11	Minimum Non-Detect	1.1
Maximum Detect	120000	Maximum Non-Detect	55
Variance Detects	5.079E+8	Percent Non-Detects	71.52%
Mean Detects	15914	SD Detects	22538
Median Detects	9400	CV Detects	1.416
Skewness Detects	2.814	Kurtosis Detects	9.942
Mean of Logged Detects	8.289	SD of Logged Detects	2.422

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.69	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.263	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.131	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4533	KM Standard Error of Mean	1118
KM SD	13893	95% KM (BCA) UCL	6616
95% KM (t) UCL	6383	95% KM (Percentile Bootstrap) UCL	6474
95% KM (z) UCL	6372	95% KM Bootstrap t UCL	7564
90% KM Chebyshev UCL	7887	95% KM Chebyshev UCL	9406
97.5% KM Chebyshev UCL	11514	99% KM Chebyshev UCL	15655

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.6	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.822	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.127	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.14	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.464	k star (bias corrected MLE)	0.448
Theta hat (MLE)	34326	Theta star (bias corrected MLE)	35560
nu hat (MLE)	41.72	nu star (bias corrected)	40.28
Mean (detects)	15914		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4532
Maximum	120000	Median	0.01
SD	13938	CV	3.075
k hat (MLE)	0.0882	k star (bias corrected MLE)	0.0907
Theta hat (MLE)	51394	Theta star (bias corrected MLE)	49953
nu hat (MLE)	27.87	nu star (bias corrected)	28.67
Adjusted Level of Significance (β)	0.0485		
Approximate Chi Square Value (28.67, α)	17.45	Adjusted Chi Square Value (28.67, β)	17.37
95% Gamma Approximate UCL (use when n>=50)	7446	95% Gamma Adjusted UCL (use when n<50)	7481

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4533	SD (KM)	13893
Variance (KM)	1.930E+8	SE of Mean (KM)	1118
k hat (KM)	0.106	k star (KM)	0.109
nu hat (KM)	33.64	nu star (KM)	34.34
theta hat (KM)	42581	theta star (KM)	41720
80% gamma percentile (KM)	3525	90% gamma percentile (KM)	12453
95% gamma percentile (KM)	26150	99% gamma percentile (KM)	69053

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (34.34, α)	21.93	Adjusted Chi Square Value (34.34, β)	21.84
95% Gamma Approximate KM-UCL (use when n>=50)	7097	95% Gamma Adjusted KM-UCL (use when n<50)	7126

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.945	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.131	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4548	Mean in Log Scale	3.512
SD in Original Scale	13933	SD in Log Scale	3.731
95% t UCL (assumes normality of ROS data)	6382	95% Percentile Bootstrap UCL	6456
95% BCA Bootstrap UCL	7229	95% Bootstrap t UCL	7236
95% H-UCL (Log ROS)	185165		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.432	KM Geo Mean	11.39
KM SD (logged)	3.912	95% Critical H Value (KM-Log)	5.813
KM Standard Error of Mean (logged)	0.315	95% H-UCL (KM -Log)	147009
KM SD (logged)	3.912	95% Critical H Value (KM-Log)	5.813
KM Standard Error of Mean (logged)	0.315		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4535	Mean in Log Scale	3.17
SD in Original Scale	13937	SD in Log Scale	3.509
95% t UCL (Assumes normality)	6370	95% H-Stat UCL	49085

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	7097

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (fluoranthene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	51
Number of Detects	36	Number of Non-Detects	68
Number of Distinct Detects	32	Number of Distinct Non-Detects	23
Minimum Detect	120	Minimum Non-Detect	77
Maximum Detect	72000	Maximum Non-Detect	3900
Variance Detects	1.969E+8	Percent Non-Detects	65.38%
Mean Detects	7081	SD Detects	14032
Median Detects	680	CV Detects	1.981
Skewness Detects	3.258	Kurtosis Detects	12.88
Mean of Logged Detects	7.187	SD of Logged Detects	1.886

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.562	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.327	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2529	KM Standard Error of Mean	874.1
KM SD	8789	95% KM (BCA) UCL	3928
95% KM (t) UCL	3979	95% KM (Percentile Bootstrap) UCL	4033
95% KM (z) UCL	3966	95% KM Bootstrap t UCL	5063
90% KM Chebyshev UCL	5151	95% KM Chebyshev UCL	6339
97.5% KM Chebyshev UCL	7987	99% KM Chebyshev UCL	11225

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.661	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.836	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.274	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.157	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.393	k star (bias corrected MLE)	0.379
Theta hat (MLE)	18007	Theta star (bias corrected MLE)	18684
nu hat (MLE)	28.31	nu star (bias corrected)	27.29
Mean (detects)	7081		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2451
Maximum	72000	Median	0.01
SD	8852	CV	3.611
k hat (MLE)	0.0978	k star (bias corrected MLE)	0.101
Theta hat (MLE)	25065	Theta star (bias corrected MLE)	24178
nu hat (MLE)	20.34	nu star (bias corrected)	21.09
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (21.09, α)	11.66	Adjusted Chi Square Value (21.09, β)	11.56
95% Gamma Approximate UCL (use when n>=50)	4434	95% Gamma Adjusted UCL (use when n<50)	4472

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2529	SD (KM)	8789
Variance (KM)	77238161	SE of Mean (KM)	874.1
k hat (KM)	0.0828	k star (KM)	0.0868
nu hat (KM)	17.22	nu star (KM)	18.05
theta hat (KM)	30546	theta star (KM)	29130
80% gamma percentile (KM)	1400	90% gamma percentile (KM)	6289
95% gamma percentile (KM)	14734	99% gamma percentile (KM)	43066

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (18.05, α)	9.431	Adjusted Chi Square Value (18.05, β)	9.343
95% Gamma Approximate KM-UCL (use when n>=50)	4841	95% Gamma Adjusted KM-UCL (use when n<50)	4886

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.935	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.179	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2482	Mean in Log Scale	4.426
SD in Original Scale	8844	SD in Log Scale	2.583
95% t UCL (assumes normality of ROS data)	3922	95% Percentile Bootstrap UCL	4026
95% BCA Bootstrap UCL	4713	95% Bootstrap t UCL	4934
95% H-UCL (Log ROS)	6568		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.53	KM Geo Mean	252.1
KM SD (logged)	1.668	95% Critical H Value (KM-Log)	2.907
KM Standard Error of Mean (logged)	0.177	95% H-UCL (KM -Log)	1633
KM SD (logged)	1.668	95% Critical H Value (KM-Log)	2.907
KM Standard Error of Mean (logged)	0.177		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2579	Mean in Log Scale	5.793
SD in Original Scale	8819	SD in Log Scale	1.584
95% t UCL (Assumes normality)	4014	95% H-Stat UCL	1784

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	6339

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (fluorene)

General Statistics

Total Number of Observations	105	Number of Distinct Observations	39
Number of Detects	12	Number of Non-Detects	93
Number of Distinct Detects	12	Number of Distinct Non-Detects	30
Minimum Detect	160	Minimum Non-Detect	3
Maximum Detect	3900	Maximum Non-Detect	3900
Variance Detects	1800991	Percent Non-Detects	88.57%
Mean Detects	1235	SD Detects	1342
Median Detects	635	CV Detects	1.087
Skewness Detects	1.36	Kurtosis Detects	0.504
Mean of Logged Detects	6.575	SD of Logged Detects	1.105

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.766	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	165.2	KM Standard Error of Mean	61.15
KM SD	585.6	95% KM (BCA) UCL	331.6
95% KM (t) UCL	266.7	95% KM (Percentile Bootstrap) UCL	290.4
95% KM (z) UCL	265.8	95% KM Bootstrap t UCL	311.8
90% KM Chebyshev UCL	348.6	95% KM Chebyshev UCL	431.7
97.5% KM Chebyshev UCL	547	99% KM Chebyshev UCL	773.6

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.507	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.189	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.252	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.056	k star (bias corrected MLE)	0.847
Theta hat (MLE)	1170	Theta star (bias corrected MLE)	1458
nu hat (MLE)	25.33	nu star (bias corrected)	20.33
Mean (detects)	1235		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	141.2
Maximum	3900	Median	0.01
SD	588.5	CV	4.169
k hat (MLE)	0.0983	k star (bias corrected MLE)	0.102
Theta hat (MLE)	1436	Theta star (bias corrected MLE)	1386
nu hat (MLE)	20.65	nu star (bias corrected)	21.39
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (21.39, α)	11.88	Adjusted Chi Square Value (21.39, β)	11.78
95% Gamma Approximate UCL (use when n>=50)	254.1	95% Gamma Adjusted UCL (use when n<50)	256.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	165.2	SD (KM)	585.6
Variance (KM)	342904	SE of Mean (KM)	61.15
k hat (KM)	0.0796	k star (KM)	0.0836
nu hat (KM)	16.71	nu star (KM)	17.57
theta hat (KM)	2076	theta star (KM)	1975
80% gamma percentile (KM)	85.55	90% gamma percentile (KM)	402.4
95% gamma percentile (KM)	962	99% gamma percentile (KM)	2864

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.57, α)	9.078	Adjusted Chi Square Value (17.57, β)	8.993
95% Gamma Approximate KM-UCL (use when n>=50)	319.6	95% Gamma Adjusted KM-UCL (use when n<50)	322.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.124	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	167.7	Mean in Log Scale	3.112
SD in Original Scale	583.3	SD in Log Scale	1.773
95% t UCL (assumes normality of ROS data)	262.2	95% Percentile Bootstrap UCL	271.1
95% BCA Bootstrap UCL	309.2	95% Bootstrap t UCL	353.4
95% H-UCL (Log ROS)	183.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.163	KM Geo Mean	8.694
KM SD (logged)	2.063	95% Critical H Value (KM-Log)	3.381
KM Standard Error of Mean (logged)	0.339	95% H-UCL (KM -Log)	144.8
KM SD (logged)	2.063	95% Critical H Value (KM-Log)	3.381
KM Standard Error of Mean (logged)	0.339		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	323.9	Mean in Log Scale	5.182
SD in Original Scale	599.1	SD in Log Scale	1.016
95% t UCL (Assumes normality)	421	95% H-Stat UCL	372.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	319.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (indeno(1,2,3-cd)pyrene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	44
Number of Detects	22	Number of Non-Detects	82
Number of Distinct Detects	20	Number of Distinct Non-Detects	26
Minimum Detect	80	Minimum Non-Detect	71
Maximum Detect	16000	Maximum Non-Detect	9000
Variance Detects	19251102	Percent Non-Detects	78.85%
Mean Detects	3319	SD Detects	4388
Median Detects	995	CV Detects	1.322
Skewness Detects	1.679	Kurtosis Detects	2.306
Mean of Logged Detects	7.118	SD of Logged Detects	1.577

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.747	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.911	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.184	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	775.8	KM Standard Error of Mean	238.7
KM SD	2375	95% KM (BCA) UCL	1184
95% KM (t) UCL	1172	95% KM (Percentile Bootstrap) UCL	1173
95% KM (z) UCL	1168	95% KM Bootstrap t UCL	1369
90% KM Chebyshev UCL	1492	95% KM Chebyshev UCL	1816
97.5% KM Chebyshev UCL	2266	99% KM Chebyshev UCL	3151

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.683	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.794	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.18	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.622	k star (bias corrected MLE)	0.567
Theta hat (MLE)	5340	Theta star (bias corrected MLE)	5852
nu hat (MLE)	27.35	nu star (bias corrected)	24.95
Mean (detects)	3319		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	702
Maximum	16000	Median	0.01
SD	2404	CV	3.424
k hat (MLE)	0.0943	k star (bias corrected MLE)	0.098
Theta hat (MLE)	7448	Theta star (bias corrected MLE)	7167
nu hat (MLE)	19.61	nu star (bias corrected)	20.37
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (20.37, α)	11.13	Adjusted Chi Square Value (20.37, β)	11.03
95% Gamma Approximate UCL (use when n>=50)	1285	95% Gamma Adjusted UCL (use when n<50)	1297

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	775.8	SD (KM)	2375
Variance (KM)	5638368	SE of Mean (KM)	238.7
k hat (KM)	0.107	k star (KM)	0.11
nu hat (KM)	22.2	nu star (KM)	22.89
theta hat (KM)	7268	theta star (KM)	7048
80% gamma percentile (KM)	613.3	90% gamma percentile (KM)	2140
95% gamma percentile (KM)	4470	99% gamma percentile (KM)	11740

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.89, α)	13.01	Adjusted Chi Square Value (22.89, β)	12.91
95% Gamma Approximate KM-UCL (use when n>=50)	1365	95% Gamma Adjusted KM-UCL (use when n<50)	1376

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.911	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.131	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.184	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	733.4	Mean in Log Scale	3.748
SD in Original Scale	2395	SD in Log Scale	2.28
95% t UCL (assumes normality of ROS data)	1123	95% Percentile Bootstrap UCL	1155
95% BCA Bootstrap UCL	1248	95% Bootstrap t UCL	1367
95% H-UCL (Log ROS)	1293		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.999	KM Geo Mean	148.3
KM SD (logged)	1.339	95% Critical H Value (KM-Log)	2.543
KM Standard Error of Mean (logged)	0.147	95% H-UCL (KM -Log)	508.3
KM SD (logged)	1.339	95% Critical H Value (KM-Log)	2.543
KM Standard Error of Mean (logged)	0.147		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	895.2	Mean in Log Scale	5.553
SD in Original Scale	2390	SD in Log Scale	1.237
95% t UCL (Assumes normality)	1284	95% H-Stat UCL	746.6

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	1365

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (lead)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	76
Number of Detects	85	Number of Non-Detects	10
Number of Distinct Detects	67	Number of Distinct Non-Detects	9
Minimum Detect	1.18	Minimum Non-Detect	5260
Maximum Detect	59000	Maximum Non-Detect	7620
Variance Detects	1.053E+8	Percent Non-Detects	10.53%
Mean Detects	10288	SD Detects	10262
Median Detects	7390	CV Detects	0.997
Skewness Detects	2.855	Kurtosis Detects	10.14
Mean of Logged Detects	8.809	SD of Logged Detects	1.247

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.71	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0962	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	9593	KM Standard Error of Mean	1021
KM SD	9874	95% KM (BCA) UCL	11397
95% KM (t) UCL	11289	95% KM (Percentile Bootstrap) UCL	11291
95% KM (z) UCL	11272	95% KM Bootstrap t UCL	11854
90% KM Chebyshev UCL	12655	95% KM Chebyshev UCL	14043
97.5% KM Chebyshev UCL	15968	99% KM Chebyshev UCL	19749

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.042	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.775	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.0992	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.305	k star (bias corrected MLE)	1.267
Theta hat (MLE)	7884	Theta star (bias corrected MLE)	8122
nu hat (MLE)	221.8	nu star (bias corrected)	215.3
Mean (detects)	10288		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	1.18	Mean	9453
Maximum	59000	Median	6300
SD	10007	CV	1.059
k hat (MLE)	1.222	k star (bias corrected MLE)	1.191
Theta hat (MLE)	7734	Theta star (bias corrected MLE)	7939
nu hat (MLE)	232.2	nu star (bias corrected)	226.2
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (226.24, α)	192.4	Adjusted Chi Square Value (226.24, β)	191.9
95% Gamma Approximate UCL (use when n>=50)	11115	95% Gamma Adjusted UCL (use when n<50)	11142

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9593	SD (KM)	9874
Variance (KM)	97493469	SE of Mean (KM)	1021
k hat (KM)	0.944	k star (KM)	0.921
nu hat (KM)	179.4	nu star (KM)	175
theta hat (KM)	10163	theta star (KM)	10414
80% gamma percentile (KM)	15537	90% gamma percentile (KM)	22540
95% gamma percentile (KM)	29588	99% gamma percentile (KM)	46055

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (175.02, α)	145.4	Adjusted Chi Square Value (175.02, β)	145
95% Gamma Approximate KM-UCL (use when n>=50)	11546	95% Gamma Adjusted KM-UCL (use when n<50)	11578

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.736	**Shapiro Wilk GOF Test**

5% Shapiro Wilk P Value	0	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.143	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0962	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	9518	Mean in Log Scale	8.722
SD in Original Scale	9961	SD in Log Scale	1.207
95% t UCL (assumes normality of ROS data)	11215	95% Percentile Bootstrap UCL	11257
95% BCA Bootstrap UCL	11689	95% Bootstrap t UCL	11707
95% H-UCL (Log ROS)	17280		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	8.718	KM Geo Mean	6109
KM SD (logged)	1.281	95% Critical H Value (KM-Log)	2.542
KM Standard Error of Mean (logged)	0.142	95% H-UCL (KM -Log)	19418
KM SD (logged)	1.281	95% Critical H Value (KM-Log)	2.542
KM Standard Error of Mean (logged)	0.142		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9554	Mean in Log Scale	8.734
SD in Original Scale	9937	SD in Log Scale	1.2
95% t UCL (Assumes normality)	11248	95% H-Stat UCL	17283

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	14043

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (methylene chloride)

General Statistics

Total Number of Observations	62	Number of Distinct Observations	29
Number of Detects	8	Number of Non-Detects	54
Number of Distinct Detects	5	Number of Distinct Non-Detects	26
Minimum Detect	2	Minimum Non-Detect	1.7
Maximum Detect	6.7	Maximum Non-Detect	2600
Variance Detects	2.561	Percent Non-Detects	87.1%
Mean Detects	3.588	SD Detects	1.6
Median Detects	3	CV Detects	0.446
Skewness Detects	1.135	Kurtosis Detects	0.897
Mean of Logged Detects	1.197	SD of Logged Detects	0.421

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.878	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.855	KM Standard Error of Mean	0.353
KM SD	1.153	95% KM (BCA) UCL	3.413
95% KM (t) UCL	3.443	95% KM (Percentile Bootstrap) UCL	3.448
95% KM (z) UCL	3.434	95% KM Bootstrap t UCL	3.624
90% KM Chebyshev UCL	3.912	95% KM Chebyshev UCL	4.391
97.5% KM Chebyshev UCL	5.056	99% KM Chebyshev UCL	6.362

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.379	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.718	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.245	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.295	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	6.415	k star (bias corrected MLE)	4.093
Theta hat (MLE)	0.559	Theta star (bias corrected MLE)	0.877
nu hat (MLE)	102.6	nu star (bias corrected)	65.49
Mean (detects)	3.588		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.918	Mean	2.679
Maximum	6.7	Median	2.578
SD	0.974	CV	0.364
k hat (MLE)	8.316	k star (bias corrected MLE)	7.925
Theta hat (MLE)	0.322	Theta star (bias corrected MLE)	0.338
nu hat (MLE)	1031	nu star (bias corrected)	982.6
Adjusted Level of Significance (β)	0.0461		
Approximate Chi Square Value (982.64, α)	910.9	Adjusted Chi Square Value (982.64, β)	909.2
95% Gamma Approximate UCL (use when n>=50)	2.89	95% Gamma Adjusted UCL (use when n<50)	2.895

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.855	SD (KM)	1.153
Variance (KM)	1.33	SE of Mean (KM)	0.353
k hat (KM)	6.127	k star (KM)	5.841
nu hat (KM)	759.7	nu star (KM)	724.3
theta hat (KM)	0.466	theta star (KM)	0.489
80% gamma percentile (KM)	3.772	90% gamma percentile (KM)	4.434
95% gamma percentile (KM)	5.033	99% gamma percentile (KM)	6.291

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (724.27, α)	662.8	Adjusted Chi Square Value (724.27, β)	661.4
95% Gamma Approximate KM-UCL (use when n>=50)	3.119	95% Gamma Adjusted KM-UCL (use when n<50)	3.126

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.218	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.686	Mean in Log Scale	0.942
SD in Original Scale	0.897	SD in Log Scale	0.3
95% t UCL (assumes normality of ROS data)	2.876	95% Percentile Bootstrap UCL	2.885
95% BCA Bootstrap UCL	2.901	95% Bootstrap t UCL	2.924
95% H-UCL (Log ROS)	2.869		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.976	KM Geo Mean	2.654
KM SD (logged)	0.373	95% Critical H Value (KM-Log)	1.789
KM Standard Error of Mean (logged)	0.122	95% H-UCL (KM -Log)	3.1
KM SD (logged)	0.373	95% Critical H Value (KM-Log)	1.789
KM Standard Error of Mean (logged)	0.122		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	51.73	Mean in Log Scale	1.572
SD in Original Scale	201.5	SD in Log Scale	1.458
95% t UCL (Assumes normality)	94.47	95% H-Stat UCL	22.01

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	3.443

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (naphthalene)

General Statistics

Total Number of Observations	128	Number of Distinct Observations	58
Number of Detects	38	Number of Non-Detects	90
Number of Distinct Detects	31	Number of Distinct Non-Detects	28
Minimum Detect	100	Minimum Non-Detect	2
Maximum Detect	79000	Maximum Non-Detect	3500
Variance Detects	2.196E+8	Percent Non-Detects	70.31%
Mean Detects	11870	SD Detects	14820
Median Detects	7800	CV Detects	1.248
Skewness Detects	3.002	Kurtosis Detects	11.11
Mean of Logged Detects	8.683	SD of Logged Detects	1.472

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.675	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.26	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.142	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3543	KM Standard Error of Mean	862.8
KM SD	9631	95% KM (BCA) UCL	5160
95% KM (t) UCL	4972	95% KM (Percentile Bootstrap) UCL	5152
95% KM (z) UCL	4962	95% KM Bootstrap t UCL	5670
90% KM Chebyshev UCL	6131	95% KM Chebyshev UCL	7304
97.5% KM Chebyshev UCL	8931	99% KM Chebyshev UCL	12128

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.681	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.784	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.129	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.148	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.843	k star (bias corrected MLE)	0.794
Theta hat (MLE)	14072	Theta star (bias corrected MLE)	14941
nu hat (MLE)	64.11	nu star (bias corrected)	60.38
Mean (detects)	11870		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3524
Maximum	79000	Median	0.01
SD	9676	CV	2.746
k hat (MLE)	0.0928	k star (bias corrected MLE)	0.0959
Theta hat (MLE)	37954	Theta star (bias corrected MLE)	36753
nu hat (MLE)	23.77	nu star (bias corrected)	24.55
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (24.55, α)	14.26	Adjusted Chi Square Value (24.55, β)	14.17
95% Gamma Approximate UCL (use when n>=50)	6064	95% Gamma Adjusted UCL (use when n<50)	6102

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3543	SD (KM)	9631
Variance (KM)	92765653	SE of Mean (KM)	862.8
k hat (KM)	0.135	k star (KM)	0.137
nu hat (KM)	34.64	nu star (KM)	35.16
theta hat (KM)	26184	theta star (KM)	25796
80% gamma percentile (KM)	3570	90% gamma percentile (KM)	10355
95% gamma percentile (KM)	19815	99% gamma percentile (KM)	47786

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (35.16, α)	22.59	Adjusted Chi Square Value (35.16, β)	22.48
95% Gamma Approximate KM-UCL (use when n>=50)	5513	95% Gamma Adjusted KM-UCL (use when n<50)	5541

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.88	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.938	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.142	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3663	Mean in Log Scale	5.818
SD in Original Scale	9627	SD in Log Scale	2.299
95% t UCL (assumes normality of ROS data)	5073	95% Percentile Bootstrap UCL	5144
95% BCA Bootstrap UCL	5546	95% Bootstrap t UCL	5824
95% H-UCL (Log ROS)	9882		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.569	KM Geo Mean	35.49
KM SD (logged)	3.667	95% Critical H Value (KM-Log)	5.389
KM Standard Error of Mean (logged)	0.437	95% H-UCL (KM -Log)	170176
KM SD (logged)	3.667	95% Critical H Value (KM-Log)	5.389
KM Standard Error of Mean (logged)	0.437		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	3664	Mean in Log Scale	6.121
SD in Original Scale	9626	SD in Log Scale	1.976
95% t UCL (Assumes normality)	5074	95% H-Stat UCL	5661

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	5513

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (phenanthrene)

General Statistics

Total Number of Observations	107	Number of Distinct Observations	51
Number of Detects	33	Number of Non-Detects	74
Number of Distinct Detects	30	Number of Distinct Non-Detects	25
Minimum Detect	49	Minimum Non-Detect	3
Maximum Detect	39000	Maximum Non-Detect	3900
Variance Detects	80977816	Percent Non-Detects	69.16%
Mean Detects	4276	SD Detects	8999
Median Detects	440	CV Detects	2.105
Skewness Detects	2.979	Kurtosis Detects	8.761
Mean of Logged Detects	6.688	SD of Logged Detects	1.863

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.525	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.319	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.152	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1386	KM Standard Error of Mean	519.2
KM SD	5287	95% KM (BCA) UCL	2298
95% KM (t) UCL	2248	95% KM (Percentile Bootstrap) UCL	2311
95% KM (z) UCL	2240	95% KM Bootstrap t UCL	2986
90% KM Chebyshev UCL	2944	95% KM Chebyshev UCL	3650
97.5% KM Chebyshev UCL	4629	99% KM Chebyshev UCL	6552

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.067	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.834	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.249	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.164	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.394	k star (bias corrected MLE)	0.379
Theta hat (MLE)	10846	Theta star (bias corrected MLE)	11294
nu hat (MLE)	26.02	nu star (bias corrected)	24.99
Mean (detects)	4276		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1319
Maximum	39000	Median	0.01
SD	5328	CV	4.04
k hat (MLE)	0.098	k star (bias corrected MLE)	0.101
Theta hat (MLE)	13454	Theta star (bias corrected MLE)	12993
nu hat (MLE)	20.97	nu star (bias corrected)	21.72
Adjusted Level of Significance (β)	0.0478		
Approximate Chi Square Value (21.72, α)	12.13	Adjusted Chi Square Value (21.72, β)	12.03
95% Gamma Approximate UCL (use when n>=50)	2362	95% Gamma Adjusted UCL (use when n<50)	2381

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1386	SD (KM)	5287
Variance (KM)	27949235	SE of Mean (KM)	519.2
k hat (KM)	0.0688	k star (KM)	0.0731
nu hat (KM)	14.72	nu star (KM)	15.64
theta hat (KM)	20160	theta star (KM)	18973
80% gamma percentile (KM)	547	90% gamma percentile (KM)	3090
95% gamma percentile (KM)	8011	99% gamma percentile (KM)	25616

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.64, α)	7.706	Adjusted Chi Square Value (15.64, β)	7.63
95% Gamma Approximate KM-UCL (use when n>=50)	2813	95% Gamma Adjusted KM-UCL (use when n<50)	2841

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.931	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.148	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.152	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1369	Mean in Log Scale	4.499
SD in Original Scale	5316	SD in Log Scale	2.1
95% t UCL (assumes normality of ROS data)	2221	95% Percentile Bootstrap UCL	2282
95% BCA Bootstrap UCL	2594	95% Bootstrap t UCL	3077
95% H-UCL (Log ROS)	1640		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.74	KM Geo Mean	114.5
KM SD (logged)	2.063	95% Critical H Value (KM-Log)	3.386
KM Standard Error of Mean (logged)	0.41	95% H-UCL (KM -Log)	1896
KM SD (logged)	2.063	95% Critical H Value (KM-Log)	3.386
KM Standard Error of Mean (logged)	0.41		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1448	Mean in Log Scale	5.479
SD in Original Scale	5299	SD in Log Scale	1.492
95% t UCL (Assumes normality)	2298	95% H-Stat UCL	1081

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	1896

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (pyrene)

General Statistics

Total Number of Observations	104	Number of Distinct Observations	55
Number of Detects	35	Number of Non-Detects	69
Number of Distinct Detects	32	Number of Distinct Non-Detects	24
Minimum Detect	130	Minimum Non-Detect	72
Maximum Detect	49000	Maximum Non-Detect	3900
Variance Detects	1.074E+8	Percent Non-Detects	66.35%
Mean Detects	5865	SD Detects	10366
Median Detects	950	CV Detects	1.767
Skewness Detects	2.684	Kurtosis Detects	8.329
Mean of Logged Detects	7.246	SD of Logged Detects	1.775

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.619	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.934	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.148	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2048	KM Standard Error of Mean	648.8
KM SD	6521	95% KM (BCA) UCL	3169
95% KM (t) UCL	3125	95% KM (Percentile Bootstrap) UCL	3162
95% KM (z) UCL	3115	95% KM Bootstrap t UCL	3813
90% KM Chebyshev UCL	3994	95% KM Chebyshev UCL	4876
97.5% KM Chebyshev UCL	6100	99% KM Chebyshev UCL	8504

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.892	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.823	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.158	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.451	k star (bias corrected MLE)	0.432
Theta hat (MLE)	13000	Theta star (bias corrected MLE)	13591
nu hat (MLE)	31.58	nu star (bias corrected)	30.21
Mean (detects)	5865		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1974
Maximum	49000	Median	0.01
SD	6574	CV	3.331
k hat (MLE)	0.0991	k star (bias corrected MLE)	0.103
Theta hat (MLE)	19918	Theta star (bias corrected MLE)	19229
nu hat (MLE)	20.61	nu star (bias corrected)	21.35
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (21.35, α)	11.85	Adjusted Chi Square Value (21.35, β)	11.75
95% Gamma Approximate UCL (use when n>=50)	3556	95% Gamma Adjusted UCL (use when n<50)	3586

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2048	SD (KM)	6521
Variance (KM)	42523134	SE of Mean (KM)	648.8
k hat (KM)	0.0986	k star (KM)	0.102
nu hat (KM)	20.51	nu star (KM)	21.25
theta hat (KM)	20766	theta star (KM)	20041
80% gamma percentile (KM)	1465	90% gamma percentile (KM)	5498
95% gamma percentile (KM)	11870	99% gamma percentile (KM)	32178

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (21.25, α)	11.78	Adjusted Chi Square Value (21.25, β)	11.68
95% Gamma Approximate KM-UCL (use when n>=50)	3694	95% Gamma Adjusted KM-UCL (use when n<50)	3726

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.934	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.146	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.148	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2008	Mean in Log Scale	4.488
SD in Original Scale	6564	SD in Log Scale	2.504
95% t UCL (assumes normality of ROS data)	3076	95% Percentile Bootstrap UCL	3072
95% BCA Bootstrap UCL	3513	95% Bootstrap t UCL	3824
95% H-UCL (Log ROS)	5400		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.482	KM Geo Mean	240.4
KM SD (logged)	1.657	95% Critical H Value (KM-Log)	2.894
KM Standard Error of Mean (logged)	0.178	95% H-UCL (KM -Log)	1520
KM SD (logged)	1.657	95% Critical H Value (KM-Log)	2.894
KM Standard Error of Mean (logged)	0.178		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2103	Mean in Log Scale	5.779
SD in Original Scale	6539	SD in Log Scale	1.56
95% t UCL (Assumes normality)	3167	95% H-Stat UCL	1678

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	1520

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (toluene)

General Statistics

Total Number of Observations	128	Number of Distinct Observations	45
Number of Detects	23	Number of Non-Detects	105
Number of Distinct Detects	17	Number of Distinct Non-Detects	31
Minimum Detect	1	Minimum Non-Detect	0.82
Maximum Detect	32000	Maximum Non-Detect	1100
Variance Detects	53179624	Percent Non-Detects	82.03%
Mean Detects	2245	SD Detects	7292
Median Detects	8	CV Detects	3.249
Skewness Detects	3.689	Kurtosis Detects	13.87
Mean of Logged Detects	2.962	SD of Logged Detects	3.023

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.355	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.442	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	405.3	KM Standard Error of Mean	284.1
KM SD	3143	95% KM (BCA) UCL	1006
95% KM (t) UCL	876	95% KM (Percentile Bootstrap) UCL	905.6
95% KM (z) UCL	872.5	95% KM Bootstrap t UCL	6589
90% KM Chebyshev UCL	1258	95% KM Chebyshev UCL	1644
97.5% KM Chebyshev UCL	2179	99% KM Chebyshev UCL	3232

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.808	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.935	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.403	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.204	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.16	k star (bias corrected MLE)	0.168
Theta hat (MLE)	14017	Theta star (bias corrected MLE)	13342
nu hat (MLE)	7.366	nu star (bias corrected)	7.739
Mean (detects)	2245		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	403.3
Maximum	32000	Median	0.01
SD	3156	CV	7.825
k hat (MLE)	0.0891	k star (bias corrected MLE)	0.0922
Theta hat (MLE)	4527	Theta star (bias corrected MLE)	4374
nu hat (MLE)	22.81	nu star (bias corrected)	23.61
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (23.61, α)	13.55	Adjusted Chi Square Value (23.61, β)	13.46
95% Gamma Approximate UCL (use when n>=50)	702.7	95% Gamma Adjusted UCL (use when n<50)	707.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	405.3	SD (KM)	3143
Variance (KM)	9881347	SE of Mean (KM)	284.1
k hat (KM)	0.0166	k star (KM)	0.0214
nu hat (KM)	4.255	nu star (KM)	5.488
theta hat (KM)	24383	theta star (KM)	18903
80% gamma percentile (KM)	0.326	90% gamma percentile (KM)	79.6
95% gamma percentile (KM)	1041	99% gamma percentile (KM)	11222

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.49, α)	1.384	Adjusted Chi Square Value (5.49, β)	1.361
95% Gamma Approximate KM-UCL (use when n>=50)	1607	95% Gamma Adjusted KM-UCL (use when n<50)	1634

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.807	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.914	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.272	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	405.8	Mean in Log Scale	0.746
SD in Original Scale	3156	SD in Log Scale	2.089
95% t UCL (assumes normality of ROS data)	868	95% Percentile Bootstrap UCL	905.5
95% BCA Bootstrap UCL	1195	95% Bootstrap t UCL	8525
95% H-UCL (Log ROS)	34.89		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.075	KM Geo Mean	2.929
KM SD (logged)	1.612	95% Critical H Value (KM-Log)	2.811
KM Standard Error of Mean (logged)	0.194	95% H-UCL (KM -Log)	16.05
KM SD (logged)	1.612	95% Critical H Value (KM-Log)	2.811
KM Standard Error of Mean (logged)	0.194		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	411.3	Mean in Log Scale	1.585
SD in Original Scale	3155	SD in Log Scale	1.576
95% t UCL (Assumes normality)	873.5	95% H-Stat UCL	24.89

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	1644

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (xylenes (total))

General Statistics

Total Number of Observations	155	Number of Distinct Observations	74
Number of Detects	45	Number of Non-Detects	110
Number of Distinct Detects	43	Number of Distinct Non-Detects	32
Minimum Detect	1	Minimum Non-Detect	1.1
Maximum Detect	310000	Maximum Non-Detect	150
Variance Detects	5.506E+9	Percent Non-Detects	70.97%
Mean Detects	41091	SD Detects	74201
Median Detects	11000	CV Detects	1.806
Skewness Detects	2.473	Kurtosis Detects	5.405
Mean of Logged Detects	8.19	SD of Logged Detects	3.439

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.595	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.29	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.131	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	11931	KM Standard Error of Mean	3551
KM SD	43712	95% KM (BCA) UCL	18336
95% KM (t) UCL	17807	95% KM (Percentile Bootstrap) UCL	17875
95% KM (z) UCL	17771	95% KM Bootstrap t UCL	21225
90% KM Chebyshev UCL	22583	95% KM Chebyshev UCL	27408
97.5% KM Chebyshev UCL	34105	99% KM Chebyshev UCL	47260

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.316	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.869	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0672	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.144	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.286	k star (bias corrected MLE)	0.281
Theta hat (MLE)	143862	Theta star (bias corrected MLE)	146023
nu hat (MLE)	25.71	nu star (bias corrected)	25.33
Mean (detects)	41091		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	11930
Maximum	310000	Median	0.01
SD	43854	CV	3.676
k hat (MLE)	0.081	k star (bias corrected MLE)	0.0838
Theta hat (MLE)	147196	Theta star (bias corrected MLE)	142395
nu hat (MLE)	25.12	nu star (bias corrected)	25.97
Adjusted Level of Significance (β)	0.0485		
Approximate Chi Square Value (25.97, α)	15.36	Adjusted Chi Square Value (25.97, β)	15.28
95% Gamma Approximate UCL (use when n>=50)	20175	95% Gamma Adjusted UCL (use when n<50)	20276

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	11931	SD (KM)	43712
Variance (KM)	1.911E+9	SE of Mean (KM)	3551
k hat (KM)	0.0745	k star (KM)	0.0774
nu hat (KM)	23.09	nu star (KM)	23.98
theta hat (KM)	160153	theta star (KM)	154233
80% gamma percentile (KM)	5311	90% gamma percentile (KM)	27680
95% gamma percentile (KM)	69252	99% gamma percentile (KM)	214678

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (23.98, α)	13.83	Adjusted Chi Square Value (23.98, β)	13.76
95% Gamma Approximate KM-UCL (use when n>=50)	20682	95% Gamma Adjusted KM-UCL (use when n<50)	20791

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.886	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.945	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.131	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	11938	Mean in Log Scale	2.541
SD in Original Scale	43852	SD in Log Scale	4.626
95% t UCL (assumes normality of ROS data)	17766	95% Percentile Bootstrap UCL	17955
95% BCA Bootstrap UCL	19739	95% Bootstrap t UCL	20763
95% H-UCL (Log ROS)	7027833		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.687	KM Geo Mean	14.69
KM SD (logged)	3.994	95% Critical H Value (KM-Log)	5.915
KM Standard Error of Mean (logged)	0.356	95% H-UCL (KM -Log)	287495
KM SD (logged)	3.994	95% Critical H Value (KM-Log)	5.915
KM Standard Error of Mean (logged)	0.356		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	11933	Mean in Log Scale	3.241
SD in Original Scale	43853	SD in Log Scale	3.705
95% t UCL (Assumes normality)	17762	95% H-Stat UCL	127187

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	20682

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Constituent	Original Data	Result	D_Result	Location ID
2-Hexanone	5.9 J	5.9	1	COE-MW-01
2-Hexanone	< 10 U	10	0	COE-MW-01
2-Hexanone	< 10 U	10	0	COE-MW-01
2-Hexanone	6.6 J	6.6	1	COE-MW-02
2-Hexanone	< 10 U	10	0	COE-MW-02
2-Hexanone	1.2 J	1.2	1	COE-MW-02
2-Hexanone	< 500 U	500	0	COE-MW-03
2-Hexanone	< 50 U	50	0	COE-MW-03
2-Hexanone	< 500 U	500	0	COE-MW-03
2-Hexanone	< 200 U	200	0	COE-MW-03
2-Hexanone	< 100 U	100	0	COE-MW-04
2-Hexanone	2.5 J	2.5	1	COE-MW-04
2-Hexanone	< 200 U	200	0	COE-MW-04
2-Hexanone	< 10 U	10	0	COE-MW-05
2-Hexanone	1.2 J	1.2	1	COE-MW-05
2-Hexanone	< 10 U	10	0	COE-MW-05
2-Hexanone	< 10 U	10	0	COE-MW-05
2-Hexanone	< 10 U	10	0	COE-MW-06
2-Hexanone	0.3 J	0.3	1	COE-MW-06
2-Hexanone	< 100 U	100	0	COE-MW-06
2-Hexanone	< 200 U	200	0	COE-MW-07
2-Hexanone	0.42 J	0.42	1	COE-MW-07
2-Hexanone	< 100 U	100	0	COE-MW-07
2-Hexanone	< 100 U	100	0	COE-MW-07
2-Hexanone	< 10 U	10	0	COE-MW-08
2-Hexanone	< 10 U	10	0	COE-MW-08
2-Hexanone	< 10 U	10	0	COE-MW-08
2-Hexanone	< 200 U	200	0	COE-MW-08
2-Hexanone	< 10 U	10	0	HA01-MW-09
2-Hexanone	< 10 U	10	0	HA01-MW-09
2-Hexanone	< 10 U	10	0	HA01-MW-10
2-Hexanone	< 10 U	10	0	HA01-MW-10
2-Hexanone	< 10 U	10	0	HA01-MW-10
2-Hexanone	< 10 U	10	0	HA01-MW-11
2-Hexanone	< 10 U	10	0	HA01-MW-11
2-Hexanone	< 10 U	10	0	HA01-MW-12
2-Hexanone	< 10 U	10	0	HA01-MW-12
2-Hexanone	< 10 U	10	0	HA01-MW-12
2-Hexanone	< 10 U	10	0	HA01-MW-12D
2-Hexanone	< 10 U	10	0	HA01-MW-12D
2-Hexanone	< 10 U	10	0	HA01-MW-13
2-Hexanone	< 10 U	10	0	HA01-MW-13
2-Hexanone	< 10 U	10	0	HA01-MW-14
2-Hexanone	< 10 U	10	0	HA01-MW-14
2-Hexanone	< 10 U	10	0	HA01-MW-14
2-Hexanone	< 10 U	10	0	HA01-MW-14 (Rep)
2-Hexanone	< 10 U	10	0	HA01-MW-14D
2-Hexanone	< 10 U	10	0	HA01-MW-14D
2-Hexanone	< 10 U	10	0	HA01-MW-15
2-Hexanone	< 10 U	10	0	HA01-MW-15
2-Hexanone	< 10 U	10	0	HA01-MW-15
2-Hexanone	< 10 U	10	0	HA01-MW-16
2-Hexanone	< 10 U	10	0	HA01-MW-17
2-Hexanone	< 10 U	10	0	HA01-MW-17
2-Hexanone	< 10 U	10	0	HA01-MW-18D
2-Hexanone	< 10 U	10	0	HMW-02
2-Hexanone	< 10 U	10	0	HMW-02
2-Hexanone	< 10 U	10	0	HMW-02
2-Hexanone	< 10 U	10	0	HMW-04
2-Hexanone	< 10 U	10	0	HMW-04
2-Hexanone	< 10 U	10	0	HMW-04
2-Hexanone	0.89 J	0.89	1	HMW-06
2-Hexanone	< 10 U	10	0	HMW-06
2-Hexanone	< 10 U	10	0	HMW-06
2-Hexanone	< 10 U	10	0	HMW-08
2-Hexanone	< 10 U	10	0	HMW-08
2-Hexanone	< 10 U	10	0	HMW-08
2-Hexanone	< 10 U	10	0	HMW-09
2-Hexanone	< 10 U	10	0	HMW-09
2-Hexanone	< 10 U	10	0	HMW-09
2-Hexanone	< 10 U	10	0	HMW-09
2-Hexanone	3.2 J	3.2	1	HMW-10

Constituent	Original Data	Result	D_Result	Location ID
2-Hexanone	0.3 J	0.3	1	HMW-10
2-Hexanone	< 10 U	10	0	HMW-10
2-Hexanone	< 10 U	10	0	HMW-11
2-Hexanone	< 10 U	10	0	HMW-11
2-Hexanone	< 10 U	10	0	HMW-11
2-Hexanone	11	11	1	HMW-13
2-Hexanone	< 10 U	10	0	HMW-13
2-Hexanone	< 10 U	10	0	HMW-13
2-Hexanone	< 10 U	10	0	HMW-13
2-Hexanone	< 10 U	10	0	HMW-13 (Rep)
2-Hexanone	0.87 J	0.87	1	HMW-14R
2-Hexanone	< 10 U	10	0	HMW-14R
2-Hexanone	< 10 U	10	0	HMW-14R
2-Hexanone	< 10 U	10	0	HMW-21
2-Hexanone	< 40 U	40	0	HMW-21
2-Hexanone	< 100 U	100	0	HMW-21
2-Hexanone	< 200 U	200	0	HMW-21
2-Hexanone	2.8 J	2.8	1	HMW-23
2-Hexanone	< 10 U	10	0	HMW-23
2-Hexanone	< 10 U	10	0	HMW-23
2-Hexanone	5.6 J	5.6	1	HMW-24
2-Hexanone	5.1 J	5.1	1	HMW-24
2-Hexanone	< 10 U	10	0	HMW-24
2-Methylnaphthalene	< 5 U	5	0	COE-MW-01
2-Methylnaphthalene	< 5 U	5	0	COE-MW-02
2-Methylnaphthalene	< 5 U	5	0	COE-MW-03
2-Methylnaphthalene	< 5 U	5	0	COE-MW-04
2-Methylnaphthalene	< 5 U	5	0	COE-MW-05
2-Methylnaphthalene	< 5 U	5	0	COE-MW-06
2-Methylnaphthalene	< 5.6 U	5.6	0	COE-MW-07
2-Methylnaphthalene	< 5.6 U	5.6	0	COE-MW-08
2-Methylnaphthalene	< 1 U	1	0	HA01-MW-10
2-Methylnaphthalene	< 1 U	1	0	HA01-MW-16
2-Methylnaphthalene	< 1.1 UJ	1.1	0	HA01-MW-18D
2-Methylnaphthalene	< 6.2 U	6.2	0	HMW-02
2-Methylnaphthalene	< 5.7 U	5.7	0	HMW-04
2-Methylnaphthalene	4.3 J	4.3	1	HMW-06
2-Methylnaphthalene	< 1 U	1	0	HMW-06
2-Methylnaphthalene	< 1 U	1	0	HMW-06
2-Methylnaphthalene	< 6.4 U	6.4	0	HMW-08
2-Methylnaphthalene	< 5.9 U	5.9	0	HMW-09
2-Methylnaphthalene	0.21 J	0.21	1	HMW-09
2-Methylnaphthalene	< 6.2 U	6.2	0	HMW-10
2-Methylnaphthalene	< 1 UJ	1	0	HMW-10
2-Methylnaphthalene	< 6.2 U	6.2	0	HMW-11
2-Methylnaphthalene	< 6.2 U	6.2	0	HMW-13
2-Methylnaphthalene	22	22	1	HMW-13
2-Methylnaphthalene	13	13	1	HMW-13
2-Methylnaphthalene	22	22	1	HMW-13 (Rep)
2-Methylnaphthalene	< 5 U	5	0	HMW-14R
2-Methylnaphthalene	< 5 U	5	0	HMW-21
2-Methylnaphthalene	8.7	8.7	1	HMW-23
2-Methylnaphthalene	9.7	9.7	1	HMW-23
2-Methylnaphthalene	9.3	9.3	1	HMW-23
2-Methylnaphthalene	< 10 U	10	0	HMW-23
2-Methylnaphthalene	17	17	1	HMW-24
2-Methylnaphthalene	0.4 J	0.4	1	HMW-24
2-Methylnaphthalene	< 10 U	10	0	HMW-24
Aldrin	0.0044 J	0.0044	1	COE-MW-01
Aldrin	4.6 J	4.6	1	COE-MW-01
Aldrin	0.008 J	0.008	1	COE-MW-01
Aldrin	< 0.025 U	0.025	0	COE-MW-02
Aldrin	0.66 J	0.66	1	COE-MW-02
Aldrin	0.0065 J	0.0065	1	COE-MW-02
Aldrin	< 0.025 U	0.025	0	COE-MW-03
Aldrin	0.22 J	0.22	1	COE-MW-03
Aldrin	< 0.025 U	0.025	0	COE-MW-04
Aldrin	< 0.028 U	0.028	0	COE-MW-04
Aldrin	< 0.025 U	0.025	0	COE-MW-05
Aldrin	< 0.025 U	0.025	0	COE-MW-05
Aldrin	< 0.025 U	0.025	0	COE-MW-06
Aldrin	< 0.025 UJ	0.025	0	COE-MW-06

Constituent	Original Data	Result	D_Result	Location ID
Aldrin	< 0.026 U	0.026	0	COE-MW-07
Aldrin	< 0.025 U	0.025	0	COE-MW-07
Aldrin	< 0.027 U	0.027	0	COE-MW-08
Aldrin	< 0.025 UJ	0.025	0	COE-MW-08
Aldrin	1 J	1	1	HA01-MW-09
Aldrin	< 0.025 U	0.025	0	HA01-MW-09
Aldrin	< 0.025 U	0.025	0	HA01-MW-11
Aldrin	< 0.027 UJ	0.027	0	HA01-MW-12
Aldrin	< 0.025 UJ	0.025	0	HA01-MW-12D
Aldrin	< 0.025 UJ	0.025	0	HA01-MW-13
Aldrin	< 0.25 UJ	0.25	0	HA01-MW-14
Aldrin	< 0.025 U	0.025	0	HA01-MW-14
Aldrin	< 0.025 U	0.025	0	HA01-MW-14 (Rep)
Aldrin	< 0.025 U	0.025	0	HA01-MW-14D
Aldrin	< 0.027 UJ	0.027	0	HA01-MW-15
Aldrin	< 0.028 U	0.028	0	HA01-MW-16
Aldrin	< 0.028 U	0.028	0	HA01-MW-18D
Aldrin	< 0.028 U	0.028	0	HMW-02
Aldrin	< 0.026 U	0.026	0	HMW-04
Aldrin	< 0.027 U	0.027	0	HMW-06
Aldrin	< 0.026 U	0.026	0	HMW-08
Aldrin	< 0.029 U	0.029	0	HMW-09
Aldrin	< 0.028 U	0.028	0	HMW-10
Aldrin	0.067 J	0.067	1	HMW-11
Aldrin	0.04 J	0.04	1	HMW-13
Aldrin	< 0.025 U	0.025	0	HMW-14R
Aldrin	0.41 J	0.41	1	HMW-14R
Aldrin	0.0018 J	0.0018	1	HMW-14R
Aldrin	< 0.025 U	0.025	0	HMW-21
Aldrin	< 0.025 U	0.025	0	HMW-21
Aldrin	0.11 J	0.11	1	HMW-23
Aldrin	0.082 J	0.082	1	HMW-24
ArsenicTotal	< 10 U	10	0	COE-MW-01
ArsenicTotal	< 10 U	10	0	COE-MW-01
ArsenicTotal	< 10 U	10	0	COE-MW-02
ArsenicTotal	< 10 U	10	0	COE-MW-02
ArsenicTotal	< 10 U	10	0	COE-MW-03
ArsenicTotal	< 10 U	10	0	COE-MW-03
ArsenicTotal	< 10 UB	10	0	COE-MW-03
ArsenicTotal	< 10 U	10	0	COE-MW-03
ArsenicTotal	< 10 U	10	0	COE-MW-04
ArsenicTotal	< 10 U	10	0	COE-MW-04
ArsenicTotal	< 10 U	10	0	COE-MW-04
ArsenicTotal	< 10 U	10	0	COE-MW-05
ArsenicTotal	< 10 U	10	0	COE-MW-05
ArsenicTotal	< 10 UB	10	0	COE-MW-05
ArsenicTotal	< 10 U	10	0	COE-MW-05
ArsenicTotal	< 10 U	10	0	COE-MW-06
ArsenicTotal	< 10 U	10	0	COE-MW-06
ArsenicTotal	5.7 J	5.7	1	COE-MW-07
ArsenicTotal	< 10 U	10	0	COE-MW-07
ArsenicTotal	< 10 UB	10	0	COE-MW-07
ArsenicTotal	< 10 U	10	0	COE-MW-08
ArsenicTotal	< 10 U	10	0	COE-MW-08
ArsenicTotal	< 10 U	10	0	COE-MW-08
ArsenicTotal	< 10 U	10	0	COE-MW-08
ArsenicTotal	4.8 J	4.8	1	HA01-MW-09
ArsenicTotal	4.8 J	4.8	1	HA01-MW-10
ArsenicTotal	< 10 UB	10	0	HA01-MW-10
ArsenicTotal	< 10 U	10	0	HA01-MW-11
ArsenicTotal	< 10 U	10	0	HA01-MW-12
ArsenicTotal	< 10 U	10	0	HA01-MW-12
ArsenicTotal	< 10 U	10	0	HA01-MW-12D
ArsenicTotal	< 10 U	10	0	HA01-MW-13
ArsenicTotal	< 10 U	10	0	HA01-MW-13
ArsenicTotal	< 10 U	10	0	HA01-MW-14
ArsenicTotal	< 10 U	10	0	HA01-MW-14
ArsenicTotal	< 10 U	10	0	HA01-MW-14 (Rep)
ArsenicTotal	< 10 U	10	0	HA01-MW-14D
ArsenicTotal	< 10 U	10	0	HA01-MW-15
ArsenicTotal	< 10 UB	10	0	HA01-MW-15

Constituent	Original Data	Result	D_Result	Location ID
ArsenicTotal	< 10 U	10	0	HA01-MW-15
ArsenicTotal	< 10 U	10	0	HA01-MW-16
ArsenicTotal	< 10 U	10	0	HA01-MW-18D
ArsenicTotal	< 10 U	10	0	HMW-02
ArsenicTotal	< 10 U	10	0	HMW-04
ArsenicTotal	< 10 U	10	0	HMW-06
ArsenicTotal	< 10 U	10	0	HMW-08
ArsenicTotal	6.2 J	6.2	1	HMW-09
ArsenicTotal	< 10 U	10	0	HMW-09
ArsenicTotal	< 10 U	10	0	HMW-10
ArsenicTotal	< 10 U	10	0	HMW-11
ArsenicTotal	6.7 J	6.7	1	HMW-13
ArsenicTotal	< 10 UB	10	0	HMW-13
ArsenicTotal	4.7 J	4.7	1	HMW-14R
ArsenicTotal	< 10 U	10	0	HMW-14R
ArsenicTotal	< 10 U	10	0	HMW-21
ArsenicTotal	< 10 U	10	0	HMW-21
ArsenicTotal	< 10 UB	10	0	HMW-21
ArsenicTotal	< 10 U	10	0	HMW-21
ArsenicTotal	< 10 U	10	0	HMW-23
ArsenicTotal	< 10 U	10	0	HMW-24
Benzene	2	2	1	COE-MW-01
Benzene	1.3	1.3	1	COE-MW-01
Benzene	< 1 U	1	0	COE-MW-01
Benzene	3.3	3.3	1	COE-MW-02
Benzene	2.5	2.5	1	COE-MW-02
Benzene	0.99 J	0.99	1	COE-MW-02
Benzene	18 J	18	1	COE-MW-03
Benzene	11	11	1	COE-MW-03
Benzene	12 J	12	1	COE-MW-03
Benzene	3.1 J	3.1	1	COE-MW-03
Benzene	2.9 J	2.9	1	COE-MW-04
Benzene	2.3	2.3	1	COE-MW-04
Benzene	< 20 U	20	0	COE-MW-04
Benzene	0.16 J	0.16	1	COE-MW-05
Benzene	0.18 J	0.18	1	COE-MW-05
Benzene	0.23 J	0.23	1	COE-MW-05
Benzene	0.46 J	0.46	1	COE-MW-05
Benzene	0.32 J	0.32	1	COE-MW-06
Benzene	0.24 J	0.24	1	COE-MW-06
Benzene	< 10 U	10	0	COE-MW-06
Benzene	< 10 U	10	0	COE-MW-07
Benzene	1.1	1.1	1	COE-MW-07
Benzene	2.8 J	2.8	1	COE-MW-07
Benzene	< 10 U	10	0	COE-MW-07
Benzene	< 0.5 U	0.5	0	COE-MW-08
Benzene	< 0.5 U	0.5	0	COE-MW-08
Benzene	< 20 U	20	0	COE-MW-08
Benzene	< 0.5 U	0.5	0	HA01-MW-09
Benzene	< 1 U	1	0	HA01-MW-09
Benzene	< 0.5 U	0.5	0	HA01-MW-10
Benzene	< 0.5 U	0.5	0	HA01-MW-10
Benzene	< 1 U	1	0	HA01-MW-10
Benzene	< 0.5 U	0.5	0	HA01-MW-11
Benzene	< 1 U	1	0	HA01-MW-11
Benzene	< 0.5 U	0.5	0	HA01-MW-12
Benzene	< 1 U	1	0	HA01-MW-12
Benzene	< 1 U	1	0	HA01-MW-12
Benzene	< 0.5 U	0.5	0	HA01-MW-12D
Benzene	< 1 U	1	0	HA01-MW-12D
Benzene	< 0.5 U	0.5	0	HA01-MW-13
Benzene	< 1 U	1	0	HA01-MW-13
Benzene	< 0.5 U	0.5	0	HA01-MW-14
Benzene	< 1 U	1	0	HA01-MW-14
Benzene	< 1 U	1	0	HA01-MW-14
Benzene	< 1 U	1	0	HA01-MW-14 (Rep)
Benzene	< 0.5 U	0.5	0	HA01-MW-14D
Benzene	< 1 U	1	0	HA01-MW-14D
Benzene	< 0.5 U	0.5	0	HA01-MW-15
Benzene	< 0.5 U	0.5	0	HA01-MW-15
Benzene	< 1 U	1	0	HA01-MW-15

Constituent	Original Data	Result	D_Result	Location ID
Benzene	< 0.5 U	0.5	0	HA01-MW-16
Benzene	< 0.5 U	0.5	0	HA01-MW-17
Benzene	< 1 U	1	0	HA01-MW-17
Benzene	< 0.5 U	0.5	0	HA01-MW-18D
Benzene	< 0.5 U	0.5	0	HMW-02
Benzene	< 0.5 U	0.5	0	HMW-02
Benzene	< 1 U	1	0	HMW-02
Benzene	< 0.5 U	0.5	0	HMW-04
Benzene	< 0.5 U	0.5	0	HMW-04
Benzene	< 1 U	1	0	HMW-04
Benzene	5.9	5.9	1	HMW-06
Benzene	< 0.5 U	0.5	0	HMW-06
Benzene	0.87 J	0.87	1	HMW-06
Benzene	< 0.5 U	0.5	0	HMW-08
Benzene	< 0.5 U	0.5	0	HMW-08
Benzene	< 1 U	1	0	HMW-08
Benzene	1.5	1.5	1	HMW-09
Benzene	< 0.5 U	0.5	0	HMW-09
Benzene	48	48	1	HMW-09
Benzene	0.44 J	0.44	1	HMW-09
Benzene	17	17	1	HMW-10
Benzene	< 0.5 U	0.5	0	HMW-10
Benzene	19	19	1	HMW-10
Benzene	0.84	0.84	1	HMW-11
Benzene	< 0.5 U	0.5	0	HMW-11
Benzene	< 1 U	1	0	HMW-11
Benzene	52	52	1	HMW-13
Benzene	56	56	1	HMW-13
Benzene	13	13	1	HMW-13
Benzene	30	30	1	HMW-13
Benzene	29	29	1	HMW-13 (Rep)
Benzene	0.41 J	0.41	1	HMW-14R
Benzene	0.21 J	0.21	1	HMW-14R
Benzene	< 1 U	1	0	HMW-14R
Benzene	< 0.5 U	0.5	0	HMW-21
Benzene	0.98 J	0.98	1	HMW-21
Benzene	< 5 U	5	0	HMW-21
Benzene	< 20 U	20	0	HMW-21
Benzene	0.36 J	0.36	1	HMW-23
Benzene	2.4	2.4	1	HMW-23
Benzene	1.1	1.1	1	HMW-23
Benzene	140	140	1	HMW-24
Benzene	4.9	4.9	1	HMW-24
Benzene	6.1	6.1	1	HMW-24
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-01
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-01
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-02
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-02
Benzene, 1-methylethyl	< 25 U	25	0	COE-MW-03
Benzene, 1-methylethyl	< 2.5 U	2.5	0	COE-MW-03
Benzene, 1-methylethyl	< 25 U	25	0	COE-MW-03
Benzene, 1-methylethyl	< 5 U	5	0	COE-MW-04
Benzene, 1-methylethyl	< 1 U	1	0	COE-MW-04
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-05
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-05
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-05
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-06
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-06
Benzene, 1-methylethyl	< 10 U	10	0	COE-MW-07
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-07
Benzene, 1-methylethyl	< 5 U	5	0	COE-MW-07
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-08
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-08
Benzene, 1-methylethyl	< 0.5 U	0.5	0	COE-MW-08
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-09
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-10
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-10
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-11
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-12
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-12D
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-13
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-14

Constituent	Original Data	Result	D_Result	Location ID
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-14D
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-15
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-15
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-16
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-17
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HA01-MW-18D
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-02
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-02
Benzene, 1-methylethyl	0.1 UB	0.1	0	HMW-04
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-04
Benzene, 1-methylethyl	6.7	6.7	1	HMW-06
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-06
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-08
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-08
Benzene, 1-methylethyl	5.8	5.8	1	HMW-09
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-09
Benzene, 1-methylethyl	40	40	1	HMW-09
Benzene, 1-methylethyl	3.5	3.5	1	HMW-10
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-10
Benzene, 1-methylethyl	0.13 UB	0.13	0	HMW-11
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-11
Benzene, 1-methylethyl	51	51	1	HMW-13
Benzene, 1-methylethyl	86	86	1	HMW-13
Benzene, 1-methylethyl	68	68	1	HMW-13
Benzene, 1-methylethyl	< 1 U	1	0	HMW-14R
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-14R
Benzene, 1-methylethyl	< 0.5 U	0.5	0	HMW-21
Benzene, 1-methylethyl	< 2 U	2	0	HMW-21
Benzene, 1-methylethyl	< 5 U	5	0	HMW-21
Benzene, 1-methylethyl	14	14	1	HMW-23
Benzene, 1-methylethyl	29	29	1	HMW-23
Benzene, 1-methylethyl	19	19	1	HMW-24
Benzene, 1-methylethyl	3.1	3.1	1	HMW-24
ChromiumTotal	< 5 U	5	0	COE-MW-01
ChromiumTotal	< 5 U	5	0	COE-MW-01
ChromiumTotal	< 5 U	5	0	COE-MW-02
ChromiumTotal	< 5 U	5	0	COE-MW-02
ChromiumTotal	2.6 J	2.6	1	COE-MW-03
ChromiumTotal	< 5 U	5	0	COE-MW-03
ChromiumTotal	4.3 J	4.3	1	COE-MW-03
ChromiumTotal	8.7	8.7	1	COE-MW-04
ChromiumTotal	3.2 UB	3.2	0	COE-MW-04
ChromiumTotal	< 5 U	5	0	COE-MW-04
ChromiumTotal	< 5 U	5	0	COE-MW-05
ChromiumTotal	3.3 UB	3.3	0	COE-MW-05
ChromiumTotal	< 5 U	5	0	COE-MW-05
ChromiumTotal	< 5 U	5	0	COE-MW-06
ChromiumTotal	3.3 UB	3.3	0	COE-MW-06
ChromiumTotal	< 5 U	5	0	COE-MW-06
ChromiumTotal	< 5 U	5	0	COE-MW-07
ChromiumTotal	< 5 U	5	0	COE-MW-07
ChromiumTotal	< 5 U	5	0	COE-MW-08
ChromiumTotal	< 5 U	5	0	COE-MW-08
ChromiumTotal	< 5 U	5	0	COE-MW-08
ChromiumTotal	< 5 U	5	0	HA01-MW-09
ChromiumTotal	6.3 UB	6.3	0	HA01-MW-10
ChromiumTotal	7.3 UB	7.3	0	HA01-MW-11
ChromiumTotal	2.9 UB	2.9	0	HA01-MW-12
ChromiumTotal	< 5 U	5	0	HA01-MW-12
ChromiumTotal	2.4 UB	2.4	0	HA01-MW-12D
ChromiumTotal	4.5 J	4.5	1	HA01-MW-13
ChromiumTotal	< 5 U	5	0	HA01-MW-13
ChromiumTotal	9.2	9.2	1	HA01-MW-14
ChromiumTotal	10 J	10	1	HA01-MW-14
ChromiumTotal	250 J	250	1	HA01-MW-14 (Rep)
ChromiumTotal	< 5 U	5	0	HA01-MW-14D
ChromiumTotal	4.2 UB	4.2	0	HA01-MW-15
ChromiumTotal	< 5 U	5	0	HA01-MW-15
ChromiumTotal	< 5 U	5	0	HA01-MW-16
ChromiumTotal	< 5 U	5	0	HA01-MW-18D
ChromiumTotal	7.6	7.6	1	HMW-02
ChromiumTotal	< 5 U	5	0	HMW-04

Constituent	Original Data	Result	D_Result	Location ID
ChromiumTotal	< 5 U	5	0	HMW-06
ChromiumTotal	< 5 U	5	0	HMW-08
ChromiumTotal	< 5 U	5	0	HMW-09
ChromiumTotal	< 5 U	5	0	HMW-10
ChromiumTotal	< 5 U	5	0	HMW-11
ChromiumTotal	3.4 J	3.4	1	HMW-13
ChromiumTotal	< 5 U	5	0	HMW-14R
ChromiumTotal	2.2 UB	2.2	0	HMW-14R
ChromiumTotal	< 5 U	5	0	HMW-21
ChromiumTotal	< 5 U	5	0	HMW-21
ChromiumTotal	4.3 J	4.3	1	HMW-21
ChromiumTotal	< 5 U	5	0	HMW-23
ChromiumTotal	< 5 U	5	0	HMW-24
cis-1,2-Dichloroethene	160	160	1	COE-MW-01
cis-1,2-Dichloroethene	92	92	1	COE-MW-01
cis-1,2-Dichloroethene	2.5	2.5	1	COE-MW-01
cis-1,2-Dichloroethene	240	240	1	COE-MW-02
cis-1,2-Dichloroethene	130	130	1	COE-MW-02
cis-1,2-Dichloroethene	51	51	1	COE-MW-02
cis-1,2-Dichloroethene	9000	9000	1	COE-MW-03
cis-1,2-Dichloroethene	7800	7800	1	COE-MW-03
cis-1,2-Dichloroethene	7800	7800	1	COE-MW-03
cis-1,2-Dichloroethene	1900	1900	1	COE-MW-03
cis-1,2-Dichloroethene	1600	1600	1	COE-MW-04
cis-1,2-Dichloroethene	1400	1400	1	COE-MW-04
cis-1,2-Dichloroethene	1400	1400	1	COE-MW-04
cis-1,2-Dichloroethene	47	47	1	COE-MW-05
cis-1,2-Dichloroethene	69	69	1	COE-MW-05
cis-1,2-Dichloroethene	81	81	1	COE-MW-05
cis-1,2-Dichloroethene	180	180	1	COE-MW-05
cis-1,2-Dichloroethene	290	290	1	COE-MW-06
cis-1,2-Dichloroethene	240	240	1	COE-MW-06
cis-1,2-Dichloroethene	850	850	1	COE-MW-06
cis-1,2-Dichloroethene	1600	1600	1	COE-MW-07
cis-1,2-Dichloroethene	1600	1600	1	COE-MW-07
cis-1,2-Dichloroethene	3800	3800	1	COE-MW-07
cis-1,2-Dichloroethene	1500	1500	1	COE-MW-07
cis-1,2-Dichloroethene	14	14	1	COE-MW-08
cis-1,2-Dichloroethene	16	16	1	COE-MW-08
cis-1,2-Dichloroethene	27	27	1	COE-MW-08
cis-1,2-Dichloroethene	110	110	1	COE-MW-08
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-09
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-09
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-10
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-10
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-10
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-11
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-11
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-12
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-12
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-12
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-12D
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-12D
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-13
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-13
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-14
cis-1,2-Dichloroethene	0.93 J	0.93	1	HA01-MW-14
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-14
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-14 (Rep)
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-14D
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-14D
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-15
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-15
cis-1,2-Dichloroethene	2.6	2.6	1	HA01-MW-15
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-16
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-17
cis-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-17
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-18D
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-02
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-02
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-02
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-04

Constituent	Original Data	Result	D_Result	Location ID
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-04
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-04
cis-1,2-Dichloroethene	0.22 J	0.22	1	HMW-06
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-06
cis-1,2-Dichloroethene	0.39 J	0.39	1	HMW-06
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-08
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-08
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-08
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-09
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-09
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-09
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-09
cis-1,2-Dichloroethene	0.32 J	0.32	1	HMW-10
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-10
cis-1,2-Dichloroethene	0.54 J	0.54	1	HMW-10
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-11
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-11
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-11
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-13
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-13
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-13
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-13
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-13 (Rep)
cis-1,2-Dichloroethene	600	600	1	HMW-14R
cis-1,2-Dichloroethene	310	310	1	HMW-14R
cis-1,2-Dichloroethene	27	27	1	HMW-14R
cis-1,2-Dichloroethene	15	15	1	HMW-21
cis-1,2-Dichloroethene	1200	1200	1	HMW-21
cis-1,2-Dichloroethene	3200	3200	1	HMW-21
cis-1,2-Dichloroethene	2300	2300	1	HMW-21
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-23
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-23
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-23
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-24
cis-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-24
cis-1,2-Dichloroethene	< 1 U	1	0	HMW-24
Cyclohexane	< 0.5 U	0.5	0	COE-MW-01
Cyclohexane	< 0.5 U	0.5	0	COE-MW-01
Cyclohexane	< 0.5 U	0.5	0	COE-MW-02
Cyclohexane	< 0.5 U	0.5	0	COE-MW-02
Cyclohexane	< 25 U	25	0	COE-MW-03
Cyclohexane	< 2.5 U	2.5	0	COE-MW-03
Cyclohexane	< 25 U	25	0	COE-MW-03
Cyclohexane	< 5 U	5	0	COE-MW-04
Cyclohexane	< 1 U	1	0	COE-MW-04
Cyclohexane	< 0.5 U	0.5	0	COE-MW-05
Cyclohexane	< 0.5 U	0.5	0	COE-MW-05
Cyclohexane	< 0.5 U	0.5	0	COE-MW-05
Cyclohexane	< 0.5 U	0.5	0	COE-MW-06
Cyclohexane	< 0.5 U	0.5	0	COE-MW-06
Cyclohexane	< 10 U	10	0	COE-MW-07
Cyclohexane	< 0.5 U	0.5	0	COE-MW-07
Cyclohexane	< 5 U	5	0	COE-MW-07
Cyclohexane	< 0.5 U	0.5	0	COE-MW-08
Cyclohexane	< 0.5 U	0.5	0	COE-MW-08
Cyclohexane	< 0.5 U	0.5	0	COE-MW-08
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-09
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-10
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-10
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-11
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-12
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-12D
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-13
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-14
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-14D
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-15
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-15
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-16
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-17
Cyclohexane	< 0.5 U	0.5	0	HA01-MW-18D
Cyclohexane	< 0.5 U	0.5	0	HMW-02
Cyclohexane	< 0.5 U	0.5	0	HMW-02

Constituent	Original Data	Result	D_Result	Location ID
Cyclohexane	< 0.5 U	0.5	0	HMW-04
Cyclohexane	< 0.5 U	0.5	0	HMW-04
Cyclohexane	3.6	3.6	1	HMW-06
Cyclohexane	< 0.5 U	0.5	0	HMW-06
Cyclohexane	< 0.5 U	0.5	0	HMW-08
Cyclohexane	< 0.5 U	0.5	0	HMW-08
Cyclohexane	6.4	6.4	1	HMW-09
Cyclohexane	< 0.5 U	0.5	0	HMW-09
Cyclohexane	65	65	1	HMW-09
Cyclohexane	9.2	9.2	1	HMW-10
Cyclohexane	< 0.5 U	0.5	0	HMW-10
Cyclohexane	< 0.5 U	0.5	0	HMW-11
Cyclohexane	< 0.5 U	0.5	0	HMW-11
Cyclohexane	76	76	1	HMW-13
Cyclohexane	130	130	1	HMW-13
Cyclohexane	54	54	1	HMW-13
Cyclohexane	< 1 U	1	0	HMW-14R
Cyclohexane	< 0.5 U	0.5	0	HMW-14R
Cyclohexane	< 0.5 U	0.5	0	HMW-21
Cyclohexane	< 2 U	2	0	HMW-21
Cyclohexane	< 5 U	5	0	HMW-21
Cyclohexane	0.34 J	0.34	1	HMW-23
Cyclohexane	25	25	1	HMW-23
Cyclohexane	47	47	1	HMW-24
Cyclohexane	< 0.5 U	0.5	0	HMW-24
delta BHC	< 0.025 U	0.025	0	COE-MW-01
delta BHC	< 0.028 U	0.028	0	COE-MW-01
delta BHC	0.013 J	0.013	1	COE-MW-01
delta BHC	< 0.025 U	0.025	0	COE-MW-02
delta BHC	< 0.028 U	0.028	0	COE-MW-02
delta BHC	0.013 J	0.013	1	COE-MW-02
delta BHC	< 0.025 U	0.025	0	COE-MW-03
delta BHC	< 0.028 UJ	0.028	0	COE-MW-03
delta BHC	< 0.025 U	0.025	0	COE-MW-04
delta BHC	< 0.028 U	0.028	0	COE-MW-04
delta BHC	< 0.025 U	0.025	0	COE-MW-05
delta BHC	< 0.025 U	0.025	0	COE-MW-05
delta BHC	< 0.025 U	0.025	0	COE-MW-06
delta BHC	< 0.025 U	0.025	0	COE-MW-06
delta BHC	< 0.026 U	0.026	0	COE-MW-07
delta BHC	< 0.025 U	0.025	0	COE-MW-07
delta BHC	< 0.027 U	0.027	0	COE-MW-08
delta BHC	< 0.025 UJ	0.025	0	COE-MW-08
delta BHC	< 0.026 U	0.026	0	HA01-MW-09
delta BHC	0.0061 J	0.0061	1	HA01-MW-09
delta BHC	< 0.025 U	0.025	0	HA01-MW-11
delta BHC	< 0.027 UJ	0.027	0	HA01-MW-12
delta BHC	< 0.025 UJ	0.025	0	HA01-MW-12D
delta BHC	< 0.025 UJ	0.025	0	HA01-MW-13
delta BHC	< 0.025 UJ	0.025	0	HA01-MW-14
delta BHC	< 0.025 U	0.025	0	HA01-MW-14
delta BHC	0.0026 UB	0.0026	0	HA01-MW-14 (Rep)
delta BHC	< 0.025 U	0.025	0	HA01-MW-14D
delta BHC	< 0.027 UJ	0.027	0	HA01-MW-15
delta BHC	< 0.028 U	0.028	0	HA01-MW-16
delta BHC	< 0.028 U	0.028	0	HA01-MW-18D
delta BHC	< 0.028 U	0.028	0	HMW-02
delta BHC	< 0.026 U	0.026	0	HMW-04
delta BHC	< 0.027 U	0.027	0	HMW-06
delta BHC	< 0.026 U	0.026	0	HMW-08
delta BHC	< 0.029 U	0.029	0	HMW-09
delta BHC	< 0.028 U	0.028	0	HMW-10
delta BHC	< 0.025 U	0.025	0	HMW-11
delta BHC	< 0.028 U	0.028	0	HMW-13
delta BHC	< 0.025 U	0.025	0	HMW-14R
delta BHC	< 0.027 U	0.027	0	HMW-14R
delta BHC	0.0095 J	0.0095	1	HMW-14R
delta BHC	< 0.025 U	0.025	0	HMW-21
delta BHC	< 0.025 U	0.025	0	HMW-21
delta BHC	< 0.028 U	0.028	0	HMW-23
delta BHC	0.057 J	0.057	1	HMW-24
Ethylbenzene	0.18 J	0.18	1	COE-MW-01

Constituent	Original Data	Result	D_Result	Location ID
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-01
Ethylbenzene	< 1 U	1	0	COE-MW-01
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-02
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-02
Ethylbenzene	< 1 U	1	0	COE-MW-02
Ethylbenzene	< 25 U	25	0	COE-MW-03
Ethylbenzene	< 2.5 U	2.5	0	COE-MW-03
Ethylbenzene	< 25 U	25	0	COE-MW-03
Ethylbenzene	< 20 U	20	0	COE-MW-03
Ethylbenzene	< 5 U	5	0	COE-MW-04
Ethylbenzene	< 1 U	1	0	COE-MW-04
Ethylbenzene	< 20 U	20	0	COE-MW-04
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-05
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-05
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-05
Ethylbenzene	< 1 U	1	0	COE-MW-05
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-06
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-06
Ethylbenzene	< 10 U	10	0	COE-MW-06
Ethylbenzene	< 10 U	10	0	COE-MW-07
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-07
Ethylbenzene	< 5 U	5	0	COE-MW-07
Ethylbenzene	< 10 U	10	0	COE-MW-07
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-08
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-08
Ethylbenzene	< 0.5 U	0.5	0	COE-MW-08
Ethylbenzene	< 20 U	20	0	COE-MW-08
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-09
Ethylbenzene	< 1 U	1	0	HA01-MW-09
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-10
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-10
Ethylbenzene	< 1 U	1	0	HA01-MW-10
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-11
Ethylbenzene	< 1 U	1	0	HA01-MW-11
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-12
Ethylbenzene	< 1 U	1	0	HA01-MW-12
Ethylbenzene	< 1 U	1	0	HA01-MW-12
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-12D
Ethylbenzene	< 1 U	1	0	HA01-MW-12D
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-13
Ethylbenzene	< 1 U	1	0	HA01-MW-13
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-14
Ethylbenzene	< 1 U	1	0	HA01-MW-14
Ethylbenzene	< 1 U	1	0	HA01-MW-14
Ethylbenzene	< 1 U	1	0	HA01-MW-14 (Rep)
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-14D
Ethylbenzene	< 1 U	1	0	HA01-MW-14D
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-15
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-15
Ethylbenzene	< 1 U	1	0	HA01-MW-15
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-16
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-17
Ethylbenzene	< 1 U	1	0	HA01-MW-17
Ethylbenzene	< 0.5 U	0.5	0	HA01-MW-18D
Ethylbenzene	< 0.5 U	0.5	0	HMW-02
Ethylbenzene	< 0.5 U	0.5	0	HMW-02
Ethylbenzene	< 1 U	1	0	HMW-02
Ethylbenzene	< 0.5 U	0.5	0	HMW-04
Ethylbenzene	< 0.5 U	0.5	0	HMW-04
Ethylbenzene	< 1 U	1	0	HMW-04
Ethylbenzene	0.67	0.67	1	HMW-06
Ethylbenzene	< 0.5 U	0.5	0	HMW-06
Ethylbenzene	< 1 U	1	0	HMW-06
Ethylbenzene	< 0.5 U	0.5	0	HMW-08
Ethylbenzene	< 0.5 U	0.5	0	HMW-08
Ethylbenzene	< 1 U	1	0	HMW-08
Ethylbenzene	2.2	2.2	1	HMW-09
Ethylbenzene	< 0.5 U	0.5	0	HMW-09
Ethylbenzene	16	16	1	HMW-09
Ethylbenzene	0.83 J	0.83	1	HMW-09
Ethylbenzene	< 0.5 U	0.5	0	HMW-10
Ethylbenzene	< 0.5 U	0.5	0	HMW-10

Constituent	Original Data	Result	D_Result	Location ID
Ethylbenzene	0.42 J	0.42	1	HMW-10
Ethylbenzene	< 0.5 U	0.5	0	HMW-11
Ethylbenzene	< 0.5 U	0.5	0	HMW-11
Ethylbenzene	< 1 U	1	0	HMW-11
Ethylbenzene	31	31	1	HMW-13
Ethylbenzene	56	56	1	HMW-13
Ethylbenzene	25	25	1	HMW-13
Ethylbenzene	27	27	1	HMW-13
Ethylbenzene	26	26	1	HMW-13 (Rep)
Ethylbenzene	< 1 U	1	0	HMW-14R
Ethylbenzene	< 0.5 U	0.5	0	HMW-14R
Ethylbenzene	< 1 U	1	0	HMW-14R
Ethylbenzene	< 0.5 U	0.5	0	HMW-21
Ethylbenzene	< 2 U	2	0	HMW-21
Ethylbenzene	< 5 U	5	0	HMW-21
Ethylbenzene	< 20 U	20	0	HMW-21
Ethylbenzene	2.6	2.6	1	HMW-23
Ethylbenzene	8.8	8.8	1	HMW-23
Ethylbenzene	3	3	1	HMW-23
Ethylbenzene	32	32	1	HMW-24
Ethylbenzene	2.1	2.1	1	HMW-24
Ethylbenzene	5.6	5.6	1	HMW-24
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-01
gamma-Chlordane	< 0.028 U	0.028	0	COE-MW-01
gamma-Chlordane	0.0029 J	0.0029	1	COE-MW-01
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-02
gamma-Chlordane	< 0.028 U	0.028	0	COE-MW-02
gamma-Chlordane	0.0022 J	0.0022	1	COE-MW-02
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-03
gamma-Chlordane	< 0.028 UJ	0.028	0	COE-MW-03
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-04
gamma-Chlordane	< 0.028 U	0.028	0	COE-MW-04
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-05
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-05
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-06
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-06
gamma-Chlordane	< 0.026 U	0.026	0	COE-MW-07
gamma-Chlordane	< 0.025 U	0.025	0	COE-MW-07
gamma-Chlordane	< 0.027 U	0.027	0	COE-MW-08
gamma-Chlordane	< 0.025 UJ	0.025	0	COE-MW-08
gamma-Chlordane	< 0.026 U	0.026	0	HA01-MW-09
gamma-Chlordane	0.0028 J	0.0028	1	HA01-MW-09
gamma-Chlordane	< 0.025 U	0.025	0	HA01-MW-11
gamma-Chlordane	< 0.027 UJ	0.027	0	HA01-MW-12
gamma-Chlordane	< 0.025 UJ	0.025	0	HA01-MW-12D
gamma-Chlordane	< 0.025 UJ	0.025	0	HA01-MW-13
gamma-Chlordane	< 0.025 UJ	0.025	0	HA01-MW-14
gamma-Chlordane	< 0.025 U	0.025	0	HA01-MW-14
gamma-Chlordane	0.0034 J	0.0034	1	HA01-MW-14 (Rep)
gamma-Chlordane	< 0.025 U	0.025	0	HA01-MW-14D
gamma-Chlordane	< 0.027 UJ	0.027	0	HA01-MW-15
gamma-Chlordane	< 0.028 U	0.028	0	HA01-MW-16
gamma-Chlordane	< 0.028 U	0.028	0	HA01-MW-18D
gamma-Chlordane	< 0.028 U	0.028	0	HMW-02
gamma-Chlordane	< 0.026 U	0.026	0	HMW-04
gamma-Chlordane	< 0.027 U	0.027	0	HMW-06
gamma-Chlordane	< 0.026 U	0.026	0	HMW-08
gamma-Chlordane	< 0.029 U	0.029	0	HMW-09
gamma-Chlordane	< 0.028 U	0.028	0	HMW-10
gamma-Chlordane	< 0.025 U	0.025	0	HMW-11
gamma-Chlordane	0.75 J	0.75	1	HMW-13
gamma-Chlordane	3.9 J	3.9	1	HMW-14R
gamma-Chlordane	< 0.027 U	0.027	0	HMW-14R
gamma-Chlordane	0.0018 J	0.0018	1	HMW-14R
gamma-Chlordane	< 0.025 U	0.025	0	HMW-21
gamma-Chlordane	< 0.025 U	0.025	0	HMW-21
gamma-Chlordane	2.2 J	2.2	1	HMW-23
gamma-Chlordane	1 J	1	1	HMW-24
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-01
Heptachlor epoxide	< 0.028 U	0.028	0	COE-MW-01
Heptachlor epoxide	0.0043 J	0.0043	1	COE-MW-01
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-02

Constituent	Original Data	Result	D_Result	Location ID
Heptachlor epoxide	< 0.028 U	0.028	0	COE-MW-02
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-02
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-03
Heptachlor epoxide	< 0.028 UJ	0.028	0	COE-MW-03
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-04
Heptachlor epoxide	< 0.028 U	0.028	0	COE-MW-04
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-05
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-05
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-06
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-06
Heptachlor epoxide	< 0.026 U	0.026	0	COE-MW-07
Heptachlor epoxide	< 0.025 U	0.025	0	COE-MW-07
Heptachlor epoxide	< 0.027 U	0.027	0	COE-MW-08
Heptachlor epoxide	< 0.025 UJ	0.025	0	COE-MW-08
Heptachlor epoxide	< 0.026 U	0.026	0	HA01-MW-09
Heptachlor epoxide	< 0.025 U	0.025	0	HA01-MW-09
Heptachlor epoxide	< 0.025 U	0.025	0	HA01-MW-11
Heptachlor epoxide	< 0.027 UJ	0.027	0	HA01-MW-12
Heptachlor epoxide	< 0.025 UJ	0.025	0	HA01-MW-12D
Heptachlor epoxide	< 0.025 UJ	0.025	0	HA01-MW-13
Heptachlor epoxide	< 0.025 UJ	0.025	0	HA01-MW-14
Heptachlor epoxide	< 0.025 U	0.025	0	HA01-MW-14
Heptachlor epoxide	< 0.025 U	0.025	0	HA01-MW-14 (Rep)
Heptachlor epoxide	< 0.025 U	0.025	0	HA01-MW-14D
Heptachlor epoxide	< 0.027 UJ	0.027	0	HA01-MW-15
Heptachlor epoxide	< 0.028 U	0.028	0	HA01-MW-16
Heptachlor epoxide	< 0.028 U	0.028	0	HA01-MW-18D
Heptachlor epoxide	< 0.028 U	0.028	0	HMW-02
Heptachlor epoxide	< 0.026 U	0.026	0	HMW-04
Heptachlor epoxide	0.026 J	0.026	1	HMW-06
Heptachlor epoxide	< 0.026 U	0.026	0	HMW-08
Heptachlor epoxide	2.5 J	2.5	1	HMW-09
Heptachlor epoxide	0.014 J	0.014	1	HMW-10
Heptachlor epoxide	0.043 J	0.043	1	HMW-11
Heptachlor epoxide	0.024 J	0.024	1	HMW-13
Heptachlor epoxide	< 0.025 U	0.025	0	HMW-14R
Heptachlor epoxide	< 0.027 U	0.027	0	HMW-14R
Heptachlor epoxide	0.0023 J	0.0023	1	HMW-14R
Heptachlor epoxide	< 0.025 U	0.025	0	HMW-21
Heptachlor epoxide	< 0.025 U	0.025	0	HMW-21
Heptachlor epoxide	< 0.028 U	0.028	0	HMW-23
Heptachlor epoxide	0.17 J	0.17	1	HMW-24
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	COE-MW-01
Hexachlorocyclohexane, Beta-	< 0.028 U	0.028	0	COE-MW-01
Hexachlorocyclohexane, Beta-	0.018 J	0.018	1	COE-MW-01
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	COE-MW-02
Hexachlorocyclohexane, Beta-	< 0.028 U	0.028	0	COE-MW-02
Hexachlorocyclohexane, Beta-	0.02 J	0.02	1	COE-MW-02
Hexachlorocyclohexane, Beta-	0.46 J	0.46	1	COE-MW-03
Hexachlorocyclohexane, Beta-	< 0.028 UJ	0.028	0	COE-MW-03
Hexachlorocyclohexane, Beta-	0.82 J	0.82	1	COE-MW-04
Hexachlorocyclohexane, Beta-	< 0.028 U	0.028	0	COE-MW-04
Hexachlorocyclohexane, Beta-	0.36 J	0.36	1	COE-MW-05
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	COE-MW-05
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	COE-MW-06
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	COE-MW-06
Hexachlorocyclohexane, Beta-	< 0.026 U	0.026	0	COE-MW-07
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	COE-MW-07
Hexachlorocyclohexane, Beta-	< 0.027 U	0.027	0	COE-MW-08
Hexachlorocyclohexane, Beta-	< 0.025 UJ	0.025	0	COE-MW-08
Hexachlorocyclohexane, Beta-	< 0.026 U	0.026	0	HA01-MW-09
Hexachlorocyclohexane, Beta-	0.079	0.079	1	HA01-MW-09
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	HA01-MW-11
Hexachlorocyclohexane, Beta-	< 0.027 UJ	0.027	0	HA01-MW-12
Hexachlorocyclohexane, Beta-	< 0.025 UJ	0.025	0	HA01-MW-12D
Hexachlorocyclohexane, Beta-	< 0.025 UJ	0.025	0	HA01-MW-13
Hexachlorocyclohexane, Beta-	< 0.025 UJ	0.025	0	HA01-MW-14
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	HA01-MW-14
Hexachlorocyclohexane, Beta-	0.0046 J	0.0046	1	HA01-MW-14 (Rep)
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	HA01-MW-14D
Hexachlorocyclohexane, Beta-	< 0.027 UJ	0.027	0	HA01-MW-15
Hexachlorocyclohexane, Beta-	< 0.028 U	0.028	0	HA01-MW-16

Constituent	Original Data	Result	D_Result	Location ID
Hexachlorocyclohexane, Beta-	< 0.028 U	0.028	0	HA01-MW-18D
Hexachlorocyclohexane, Beta-	< 0.028 U	0.028	0	HMW-02
Hexachlorocyclohexane, Beta-	< 0.026 U	0.026	0	HMW-04
Hexachlorocyclohexane, Beta-	< 0.027 U	0.027	0	HMW-06
Hexachlorocyclohexane, Beta-	< 0.026 U	0.026	0	HMW-08
Hexachlorocyclohexane, Beta-	0.5 J	0.5	1	HMW-09
Hexachlorocyclohexane, Beta-	< 0.028 U	0.028	0	HMW-10
Hexachlorocyclohexane, Beta-	0.024 J	0.024	1	HMW-11
Hexachlorocyclohexane, Beta-	0.034 J	0.034	1	HMW-13
Hexachlorocyclohexane, Beta-	0.52 J	0.52	1	HMW-14R
Hexachlorocyclohexane, Beta-	< 0.027 U	0.027	0	HMW-14R
Hexachlorocyclohexane, Beta-	0.0058 J	0.0058	1	HMW-14R
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	HMW-21
Hexachlorocyclohexane, Beta-	< 0.025 U	0.025	0	HMW-21
Hexachlorocyclohexane, Beta-	0.077	0.077	1	HMW-23
Hexachlorocyclohexane, Beta-	0.076 J	0.076	1	HMW-24
IronDissolved	15000	15000	1	COE-MW-03
IronDissolved	2500	2500	1	COE-MW-05
IronDissolved	2100	2100	1	COE-MW-07
IronDissolved	16000	16000	1	COE-MW-08
IronDissolved	350	350	1	HA01-MW-10
IronDissolved	5500	5500	1	HA01-MW-15
IronDissolved	12000	12000	1	HMW-09
IronDissolved	34000	34000	1	HMW-13
IronDissolved	1300	1300	1	HMW-21
IronTotal	17000	17000	1	COE-MW-03
IronTotal	3400	3400	1	COE-MW-05
IronTotal	4200	4200	1	COE-MW-07
IronTotal	18000	18000	1	COE-MW-08
IronTotal	1800	1800	1	HA01-MW-10
IronTotal	7500	7500	1	HA01-MW-15
IronTotal	16000	16000	1	HMW-09
IronTotal	36000	36000	1	HMW-13
IronTotal	3100	3100	1	HMW-21
LeadTotal	< 10 U	10	0	COE-MW-01
LeadTotal	< 10 U	10	0	COE-MW-01
LeadTotal	< 10 U	10	0	COE-MW-02
LeadTotal	< 10 U	10	0	COE-MW-02
LeadTotal	3 UB	3	0	COE-MW-03
LeadTotal	< 10 U	10	0	COE-MW-03
LeadTotal	< 10 U	10	0	COE-MW-03
LeadTotal	< 10 U	10	0	COE-MW-04
LeadTotal	< 10 U	10	0	COE-MW-04
LeadTotal	4.4 J	4.4	1	COE-MW-04
LeadTotal	< 10 U	10	0	COE-MW-05
LeadTotal	< 10 U	10	0	COE-MW-05
LeadTotal	5.9 J	5.9	1	COE-MW-05
LeadTotal	< 10 U	10	0	COE-MW-06
LeadTotal	< 10 U	10	0	COE-MW-06
LeadTotal	5.5 J	5.5	1	COE-MW-06
LeadTotal	3.7 UB	3.7	0	COE-MW-07
LeadTotal	< 10 U	10	0	COE-MW-07
LeadTotal	4.2 UB	4.2	0	COE-MW-08
LeadTotal	< 10 U	10	0	COE-MW-08
LeadTotal	5.7 J	5.7	1	COE-MW-08
LeadTotal	< 10 U	10	0	HA01-MW-09
LeadTotal	< 10 U	10	0	HA01-MW-10
LeadTotal	< 10 U	10	0	HA01-MW-11
LeadTotal	< 10 U	10	0	HA01-MW-12
LeadTotal	5.4 J	5.4	1	HA01-MW-12
LeadTotal	2.8 J	2.8	1	HA01-MW-12D
LeadTotal	< 10 U	10	0	HA01-MW-13
LeadTotal	7 J	7	1	HA01-MW-13
LeadTotal	< 10 U	10	0	HA01-MW-14
LeadTotal	12	12	1	HA01-MW-14
LeadTotal	23	23	1	HA01-MW-14 (Rep)
LeadTotal	< 10 U	10	0	HA01-MW-14D
LeadTotal	< 10 U	10	0	HA01-MW-15
LeadTotal	6.1 J	6.1	1	HA01-MW-15
LeadTotal	< 10 U	10	0	HA01-MW-16
LeadTotal	< 10 U	10	0	HA01-MW-18D
LeadTotal	11 UB	11	0	HMW-02

Constituent	Original Data	Result	D_Result	Location ID
LeadTotal	< 10 U	10	0	HMW-04
LeadTotal	3.8 UB	3.8	0	HMW-06
LeadTotal	2.7 UB	2.7	0	HMW-08
LeadTotal	4.6 UB	4.6	0	HMW-09
LeadTotal	< 10 U	10	0	HMW-10
LeadTotal	2.8 UB	2.8	0	HMW-11
LeadTotal	3.6 UB	3.6	0	HMW-13
LeadTotal	3.7 UB	3.7	0	HMW-14R
LeadTotal	< 10 U	10	0	HMW-14R
LeadTotal	1.9 UB	1.9	0	HMW-21
LeadTotal	< 10 U	10	0	HMW-21
LeadTotal	10	10	1	HMW-21
LeadTotal	2.7 UB	2.7	0	HMW-23
LeadTotal	< 10 U	10	0	HMW-24
Lindane	0.019 J	0.019	1	COE-MW-01
Lindane	< 0.028 U	0.028	0	COE-MW-01
Lindane	0.0043 J	0.0043	1	COE-MW-01
Lindane	< 0.025 U	0.025	0	COE-MW-02
Lindane	< 0.028 U	0.028	0	COE-MW-02
Lindane	0.009 J	0.009	1	COE-MW-02
Lindane	< 0.025 U	0.025	0	COE-MW-03
Lindane	< 0.028 UJ	0.028	0	COE-MW-03
Lindane	< 0.025 U	0.025	0	COE-MW-04
Lindane	< 0.028 U	0.028	0	COE-MW-04
Lindane	< 0.025 U	0.025	0	COE-MW-05
Lindane	< 0.025 U	0.025	0	COE-MW-05
Lindane	< 0.025 U	0.025	0	COE-MW-06
Lindane	< 0.025 U	0.025	0	COE-MW-06
Lindane	< 0.026 U	0.026	0	COE-MW-07
Lindane	< 0.025 U	0.025	0	COE-MW-07
Lindane	< 0.027 U	0.027	0	COE-MW-08
Lindane	< 0.025 UJ	0.025	0	COE-MW-08
Lindane	< 0.026 U	0.026	0	HA01-MW-09
Lindane	0.014 J	0.014	1	HA01-MW-09
Lindane	< 0.025 U	0.025	0	HA01-MW-11
Lindane	< 0.027 UJ	0.027	0	HA01-MW-12
Lindane	< 0.025 UJ	0.025	0	HA01-MW-12D
Lindane	< 0.025 UJ	0.025	0	HA01-MW-13
Lindane	< 0.025 UJ	0.025	0	HA01-MW-14
Lindane	0.0063 UB	0.0063	0	HA01-MW-14
Lindane	0.0083 UB	0.0083	0	HA01-MW-14 (Rep)
Lindane	< 0.025 U	0.025	0	HA01-MW-14D
Lindane	< 0.027 UJ	0.027	0	HA01-MW-15
Lindane	< 0.028 U	0.028	0	HA01-MW-16
Lindane	< 0.028 U	0.028	0	HA01-MW-18D
Lindane	< 0.028 U	0.028	0	HMW-02
Lindane	< 0.026 U	0.026	0	HMW-04
Lindane	< 0.027 U	0.027	0	HMW-06
Lindane	< 0.026 U	0.026	0	HMW-08
Lindane	0.17 J	0.17	1	HMW-09
Lindane	< 0.028 U	0.028	0	HMW-10
Lindane	< 0.025 U	0.025	0	HMW-11
Lindane	< 0.028 U	0.028	0	HMW-13
Lindane	< 0.025 U	0.025	0	HMW-14R
Lindane	< 0.027 U	0.027	0	HMW-14R
Lindane	0.0039 J	0.0039	1	HMW-14R
Lindane	< 0.025 U	0.025	0	HMW-21
Lindane	< 0.025 U	0.025	0	HMW-21
Lindane	0.025 J	0.025	1	HMW-23
Lindane	0.026 J	0.026	1	HMW-24
ManganeseDissolved	130	130	1	COE-MW-03
ManganeseDissolved	87	87	1	COE-MW-05
ManganeseDissolved	77	77	1	COE-MW-07
ManganeseDissolved	440	440	1	COE-MW-08
ManganeseDissolved	120	120	1	HA01-MW-10
ManganeseDissolved	180	180	1	HA01-MW-15
ManganeseDissolved	160	160	1	HMW-09
ManganeseDissolved	1800	1800	1	HMW-13
ManganeseDissolved	53	53	1	HMW-21
ManganeseTotal	140	140	1	COE-MW-03
ManganeseTotal	91	91	1	COE-MW-05
ManganeseTotal	84	84	1	COE-MW-07

Constituent	Original Data	Result	D_Result	Location ID
ManganeseTotal	470	470	1	COE-MW-08
ManganeseTotal	110	110	1	HA01-MW-10
ManganeseTotal	200	200	1	HA01-MW-15
ManganeseTotal	130	130	1	HMW-09
ManganeseTotal	1800	1800	1	HMW-13
ManganeseTotal	55	55	1	HMW-21
MercuryTotal	< 0.1 U	0.1	0	COE-MW-01
MercuryTotal	0.057 J	0.057	1	COE-MW-01
MercuryTotal	< 0.1 U	0.1	0	COE-MW-02
MercuryTotal	< 0.1 U	0.1	0	COE-MW-02
MercuryTotal	< 0.1 U	0.1	0	COE-MW-03
MercuryTotal	< 0.1 U	0.1	0	COE-MW-03
MercuryTotal	0.018 J	0.018	1	COE-MW-03
MercuryTotal	< 0.1 U	0.1	0	COE-MW-04
MercuryTotal	< 0.1 U	0.1	0	COE-MW-04
MercuryTotal	0.016 J	0.016	1	COE-MW-04
MercuryTotal	< 0.1 U	0.1	0	COE-MW-05
MercuryTotal	< 0.1 U	0.1	0	COE-MW-05
MercuryTotal	0.037 J	0.037	1	COE-MW-05
MercuryTotal	< 0.1 U	0.1	0	COE-MW-06
MercuryTotal	< 0.1 U	0.1	0	COE-MW-06
MercuryTotal	< 0.1 U	0.1	0	COE-MW-06
MercuryTotal	< 0.1 UJ	0.1	0	COE-MW-07
MercuryTotal	< 0.1 U	0.1	0	COE-MW-07
MercuryTotal	< 0.1 U	0.1	0	COE-MW-08
MercuryTotal	< 0.1 U	0.1	0	COE-MW-08
MercuryTotal	< 0.1 U	0.1	0	COE-MW-08
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-09
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-10
MercuryTotal	0.059 J	0.059	1	HA01-MW-11
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-12
MercuryTotal	0.016 J	0.016	1	HA01-MW-12
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-12D
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-13
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-13
MercuryTotal	0.082 J	0.082	1	HA01-MW-14
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-14
MercuryTotal	0.027 J	0.027	1	HA01-MW-14 (Rep)
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-14D
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-15
MercuryTotal	0.017 J	0.017	1	HA01-MW-15
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-16
MercuryTotal	< 0.1 U	0.1	0	HA01-MW-18D
MercuryTotal	0.1	0.1	1	HMW-02
MercuryTotal	< 0.1 U	0.1	0	HMW-04
MercuryTotal	< 0.1 U	0.1	0	HMW-06
MercuryTotal	< 0.1 U	0.1	0	HMW-08
MercuryTotal	< 0.1 U	0.1	0	HMW-09
MercuryTotal	< 0.1 U	0.1	0	HMW-10
MercuryTotal	0.1	0.1	1	HMW-11
MercuryTotal	< 0.1 U	0.1	0	HMW-13
MercuryTotal	< 0.1 U	0.1	0	HMW-14R
MercuryTotal	< 0.1 U	0.1	0	HMW-14R
MercuryTotal	< 0.1 U	0.1	0	HMW-21
MercuryTotal	< 0.1 U	0.1	0	HMW-21
MercuryTotal	0.1	0.1	1	HMW-21
MercuryTotal	< 0.1 U	0.1	0	HMW-23
MercuryTotal	< 0.1 U	0.1	0	HMW-24
Methylcyclohexane	< 5 U	5	0	COE-MW-01
Methylcyclohexane	< 5 U	5	0	COE-MW-01
Methylcyclohexane	< 5 U	5	0	COE-MW-02
Methylcyclohexane	< 5 U	5	0	COE-MW-02
Methylcyclohexane	< 250 U	250	0	COE-MW-03
Methylcyclohexane	< 25 U	25	0	COE-MW-03
Methylcyclohexane	< 250 UJ	250	0	COE-MW-03
Methylcyclohexane	< 50 U	50	0	COE-MW-04
Methylcyclohexane	< 10 U	10	0	COE-MW-04
Methylcyclohexane	< 5 U	5	0	COE-MW-05
Methylcyclohexane	< 5 U	5	0	COE-MW-05
Methylcyclohexane	< 5 U	5	0	COE-MW-05
Methylcyclohexane	< 5 U	5	0	COE-MW-06
Methylcyclohexane	< 5 U	5	0	COE-MW-06

Constituent	Original Data	Result	D_Result	Location ID
Methylcyclohexane	< 100 U	100	0	COE-MW-07
Methylcyclohexane	< 5 U	5	0	COE-MW-07
Methylcyclohexane	< 50 UJ	50	0	COE-MW-07
Methylcyclohexane	< 5 U	5	0	COE-MW-08
Methylcyclohexane	< 5 U	5	0	COE-MW-08
Methylcyclohexane	< 5 U	5	0	COE-MW-08
Methylcyclohexane	< 5 U	5	0	HA01-MW-09
Methylcyclohexane	< 5 U	5	0	HA01-MW-10
Methylcyclohexane	< 5 U	5	0	HA01-MW-10
Methylcyclohexane	< 5 U	5	0	HA01-MW-11
Methylcyclohexane	< 5 U	5	0	HA01-MW-12
Methylcyclohexane	< 5 U	5	0	HA01-MW-12D
Methylcyclohexane	< 5 U	5	0	HA01-MW-13
Methylcyclohexane	< 5 U	5	0	HA01-MW-14
Methylcyclohexane	< 5 U	5	0	HA01-MW-14D
Methylcyclohexane	< 5 U	5	0	HA01-MW-15
Methylcyclohexane	< 5 U	5	0	HA01-MW-15
Methylcyclohexane	< 5 U	5	0	HA01-MW-16
Methylcyclohexane	< 5 U	5	0	HA01-MW-17
Methylcyclohexane	< 5 U	5	0	HA01-MW-18D
Methylcyclohexane	< 5 U	5	0	HMW-02
Methylcyclohexane	< 5 U	5	0	HMW-02
Methylcyclohexane	< 5 U	5	0	HMW-04
Methylcyclohexane	< 5 U	5	0	HMW-04
Methylcyclohexane	< 5 U	5	0	HMW-06
Methylcyclohexane	< 5 U	5	0	HMW-06
Methylcyclohexane	< 5 U	5	0	HMW-08
Methylcyclohexane	< 5 U	5	0	HMW-08
Methylcyclohexane	2.4 J	2.4	1	HMW-09
Methylcyclohexane	< 5 U	5	0	HMW-09
Methylcyclohexane	30	30	1	HMW-09
Methylcyclohexane	1.1 J	1.1	1	HMW-10
Methylcyclohexane	< 5 U	5	0	HMW-10
Methylcyclohexane	< 5 U	5	0	HMW-11
Methylcyclohexane	< 5 U	5	0	HMW-11
Methylcyclohexane	78	78	1	HMW-13
Methylcyclohexane	160	160	1	HMW-13
Methylcyclohexane	91	91	1	HMW-13
Methylcyclohexane	< 10 U	10	0	HMW-14R
Methylcyclohexane	< 5 U	5	0	HMW-14R
Methylcyclohexane	< 5 U	5	0	HMW-21
Methylcyclohexane	< 20 U	20	0	HMW-21
Methylcyclohexane	< 50 UJ	50	0	HMW-21
Methylcyclohexane	< 5 U	5	0	HMW-23
Methylcyclohexane	2 J	2	1	HMW-23
Methylcyclohexane	12	12	1	HMW-24
Methylcyclohexane	< 5 U	5	0	HMW-24
Naphthalene	< 5 U	5	0	COE-MW-01
Naphthalene	< 5 U	5	0	COE-MW-02
Naphthalene	< 5 U	5	0	COE-MW-03
Naphthalene	< 5 U	5	0	COE-MW-04
Naphthalene	< 5 U	5	0	COE-MW-05
Naphthalene	< 5 U	5	0	COE-MW-06
Naphthalene	< 5.6 U	5.6	0	COE-MW-07
Naphthalene	< 5.6 U	5.6	0	COE-MW-08
Naphthalene	< 1 U	1	0	HA01-MW-10
Naphthalene	< 1 U	1	0	HA01-MW-16
Naphthalene	< 1.1 UJ	1.1	0	HA01-MW-18D
Naphthalene	< 6.2 U	6.2	0	HMW-02
Naphthalene	< 5.7 U	5.7	0	HMW-04
Naphthalene	22	22	1	HMW-06
Naphthalene	< 1 U	1	0	HMW-06
Naphthalene	< 1 U	1	0	HMW-06
Naphthalene	< 6.4 U	6.4	0	HMW-08
Naphthalene	< 5.9 U	5.9	0	HMW-09
Naphthalene	4.1	4.1	1	HMW-09
Naphthalene	< 6.2 U	6.2	0	HMW-10
Naphthalene	< 1 UJ	1	0	HMW-10
Naphthalene	< 6.2 U	6.2	0	HMW-11
Naphthalene	19	19	1	HMW-13
Naphthalene	100	100	1	HMW-13
Naphthalene	88	88	1	HMW-13

Constituent	Original Data	Result	D_Result	Location ID
Naphthalene	120	120	1	HMW-13 (Rep)
Naphthalene	< 5 U	5	0	HMW-14R
Naphthalene	< 5 U	5	0	HMW-21
Naphthalene	63	63	1	HMW-23
Naphthalene	58	58	1	HMW-23
Naphthalene	39	39	1	HMW-23
Naphthalene	9 J	9	1	HMW-23
Naphthalene	95	95	1	HMW-24
Naphthalene	3.2	3.2	1	HMW-24
Naphthalene	< 10 U	10	0	HMW-24
Toluene	1.1	1.1	1	COE-MW-01
Toluene	0.87	0.87	1	COE-MW-01
Toluene	< 1 U	1	0	COE-MW-01
Toluene	< 0.5 U	0.5	0	COE-MW-02
Toluene	< 0.5 U	0.5	0	COE-MW-02
Toluene	< 1 U	1	0	COE-MW-02
Toluene	53	53	1	COE-MW-03
Toluene	42	42	1	COE-MW-03
Toluene	40	40	1	COE-MW-03
Toluene	6.9 J	6.9	1	COE-MW-03
Toluene	< 5 U	5	0	COE-MW-04
Toluene	0.75 J	0.75	1	COE-MW-04
Toluene	< 20 U	20	0	COE-MW-04
Toluene	< 0.5 U	0.5	0	COE-MW-05
Toluene	< 0.5 U	0.5	0	COE-MW-05
Toluene	< 0.5 U	0.5	0	COE-MW-05
Toluene	< 1 U	1	0	COE-MW-05
Toluene	< 0.5 U	0.5	0	COE-MW-06
Toluene	< 0.5 U	0.5	0	COE-MW-06
Toluene	< 10 U	10	0	COE-MW-06
Toluene	< 10 U	10	0	COE-MW-07
Toluene	< 0.5 U	0.5	0	COE-MW-07
Toluene	< 5 U	5	0	COE-MW-07
Toluene	< 10 U	10	0	COE-MW-07
Toluene	< 0.5 U	0.5	0	COE-MW-08
Toluene	< 0.5 U	0.5	0	COE-MW-08
Toluene	< 0.5 U	0.5	0	COE-MW-08
Toluene	< 20 U	20	0	COE-MW-08
Toluene	< 0.5 U	0.5	0	HA01-MW-09
Toluene	1.4	1.4	1	HA01-MW-09
Toluene	< 0.5 U	0.5	0	HA01-MW-10
Toluene	< 0.5 U	0.5	0	HA01-MW-10
Toluene	< 1 U	1	0	HA01-MW-10
Toluene	< 0.5 U	0.5	0	HA01-MW-11
Toluene	< 1 U	1	0	HA01-MW-11
Toluene	< 0.5 U	0.5	0	HA01-MW-12
Toluene	< 1 U	1	0	HA01-MW-12
Toluene	< 1 U	1	0	HA01-MW-12
Toluene	< 0.5 U	0.5	0	HA01-MW-12D
Toluene	< 1 U	1	0	HA01-MW-12D
Toluene	< 0.5 U	0.5	0	HA01-MW-13
Toluene	< 1 U	1	0	HA01-MW-13
Toluene	240	240	1	HA01-MW-14
Toluene	< 1 U	1	0	HA01-MW-14
Toluene	< 1 U	1	0	HA01-MW-14
Toluene	< 1 U	1	0	HA01-MW-14 (Rep)
Toluene	< 0.5 U	0.5	0	HA01-MW-14D
Toluene	< 1 U	1	0	HA01-MW-14D
Toluene	< 0.5 U	0.5	0	HA01-MW-15
Toluene	< 0.5 U	0.5	0	HA01-MW-15
Toluene	< 1 U	1	0	HA01-MW-15
Toluene	< 0.5 U	0.5	0	HA01-MW-16
Toluene	< 0.5 U	0.5	0	HA01-MW-17
Toluene	< 1 U	1	0	HA01-MW-17
Toluene	< 0.5 U	0.5	0	HA01-MW-18D
Toluene	< 0.5 U	0.5	0	HMW-02
Toluene	< 0.5 U	0.5	0	HMW-02
Toluene	< 1 U	1	0	HMW-02
Toluene	< 0.5 U	0.5	0	HMW-04
Toluene	< 0.5 U	0.5	0	HMW-04
Toluene	< 1 U	1	0	HMW-04
Toluene	< 0.5 U	0.5	0	HMW-06

Constituent	Original Data	Result	D_Result	Location ID
Toluene	< 0.5 U	0.5	0	HMW-06
Toluene	< 1 U	1	0	HMW-06
Toluene	< 0.5 U	0.5	0	HMW-08
Toluene	< 0.5 U	0.5	0	HMW-08
Toluene	< 1 U	1	0	HMW-08
Toluene	< 0.5 U	0.5	0	HMW-09
Toluene	< 0.5 U	0.5	0	HMW-09
Toluene	0.24 J	0.24	1	HMW-09
Toluene	< 1 U	1	0	HMW-09
Toluene	0.18 J	0.18	1	HMW-10
Toluene	< 0.5 U	0.5	0	HMW-10
Toluene	0.35 J	0.35	1	HMW-10
Toluene	< 0.5 U	0.5	0	HMW-11
Toluene	< 0.5 U	0.5	0	HMW-11
Toluene	< 1 U	1	0	HMW-11
Toluene	0.57	0.57	1	HMW-13
Toluene	0.48 J	0.48	1	HMW-13
Toluene	0.18 J	0.18	1	HMW-13
Toluene	< 1 U	1	0	HMW-13
Toluene	< 1 U	1	0	HMW-13 (Rep)
Toluene	< 1 U	1	0	HMW-14R
Toluene	< 0.5 U	0.5	0	HMW-14R
Toluene	< 1 U	1	0	HMW-14R
Toluene	< 0.5 U	0.5	0	HMW-21
Toluene	< 2 U	2	0	HMW-21
Toluene	< 5 U	5	0	HMW-21
Toluene	< 20 U	20	0	HMW-21
Toluene	< 0.5 U	0.5	0	HMW-23
Toluene	0.37 J	0.37	1	HMW-23
Toluene	< 1 U	1	0	HMW-23
Toluene	0.65	0.65	1	HMW-24
Toluene	< 0.5 U	0.5	0	HMW-24
Toluene	< 1 U	1	0	HMW-24
trans-1,2-Dichloroethene	12	12	1	COE-MW-01
trans-1,2-Dichloroethene	6.8	6.8	1	COE-MW-01
trans-1,2-Dichloroethene	< 1 U	1	0	COE-MW-01
trans-1,2-Dichloroethene	9.9	9.9	1	COE-MW-02
trans-1,2-Dichloroethene	4.5	4.5	1	COE-MW-02
trans-1,2-Dichloroethene	2.1	2.1	1	COE-MW-02
trans-1,2-Dichloroethene	240	240	1	COE-MW-03
trans-1,2-Dichloroethene	230	230	1	COE-MW-03
trans-1,2-Dichloroethene	190	190	1	COE-MW-03
trans-1,2-Dichloroethene	98	98	1	COE-MW-03
trans-1,2-Dichloroethene	7.6	7.6	1	COE-MW-04
trans-1,2-Dichloroethene	9.3	9.3	1	COE-MW-04
trans-1,2-Dichloroethene	12 J	12	1	COE-MW-04
trans-1,2-Dichloroethene	0.19 J	0.19	1	COE-MW-05
trans-1,2-Dichloroethene	0.29 J	0.29	1	COE-MW-05
trans-1,2-Dichloroethene	0.31 J	0.31	1	COE-MW-05
trans-1,2-Dichloroethene	1.1	1.1	1	COE-MW-05
trans-1,2-Dichloroethene	0.2 J	0.2	1	COE-MW-06
trans-1,2-Dichloroethene	0.6	0.6	1	COE-MW-06
trans-1,2-Dichloroethene	2.4 J	2.4	1	COE-MW-06
trans-1,2-Dichloroethene	6.1 J	6.1	1	COE-MW-07
trans-1,2-Dichloroethene	8.9	8.9	1	COE-MW-07
trans-1,2-Dichloroethene	19	19	1	COE-MW-07
trans-1,2-Dichloroethene	6.9 J	6.9	1	COE-MW-07
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	COE-MW-08
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	COE-MW-08
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	COE-MW-08
trans-1,2-Dichloroethene	< 20 U	20	0	COE-MW-08
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-09
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-09
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-10
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-10
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-10
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-11
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-11
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-12
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-12
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-12
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-12D

Constituent	Original Data	Result	D_Result	Location ID
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-12D
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-13
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-13
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-14
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-14
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-14
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-14 (Rep)
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-14D
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-14D
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-15
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-15
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-15
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-16
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-17
trans-1,2-Dichloroethene	< 1 U	1	0	HA01-MW-17
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HA01-MW-18D
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-02
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-02
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-02
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-04
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-04
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-04
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-06
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-06
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-06
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-08
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-08
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-08
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-09
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-09
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-09
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-09
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-10
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-10
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-10
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-11
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-11
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-11
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-13
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-13
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-13
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-13
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-13 (Rep)
trans-1,2-Dichloroethene	25	25	1	HMW-14R
trans-1,2-Dichloroethene	17	17	1	HMW-14R
trans-1,2-Dichloroethene	3.4	3.4	1	HMW-14R
trans-1,2-Dichloroethene	0.7	0.7	1	HMW-21
trans-1,2-Dichloroethene	3.5	3.5	1	HMW-21
trans-1,2-Dichloroethene	9.5	9.5	1	HMW-21
trans-1,2-Dichloroethene	10 J	10	1	HMW-21
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-23
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-23
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-23
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-24
trans-1,2-Dichloroethene	< 0.5 U	0.5	0	HMW-24
trans-1,2-Dichloroethene	< 1 U	1	0	HMW-24
Trichloroethene	< 0.5 U	0.5	0	COE-MW-01
Trichloroethene	< 0.5 U	0.5	0	COE-MW-01
Trichloroethene	< 1 U	1	0	COE-MW-01
Trichloroethene	< 0.5 U	0.5	0	COE-MW-02
Trichloroethene	< 0.5 U	0.5	0	COE-MW-02
Trichloroethene	< 1 U	1	0	COE-MW-02
Trichloroethene	< 25 U	25	0	COE-MW-03
Trichloroethene	< 2.5 U	2.5	0	COE-MW-03
Trichloroethene	< 25 U	25	0	COE-MW-03
Trichloroethene	< 20 U	20	0	COE-MW-03
Trichloroethene	< 5 U	5	0	COE-MW-04
Trichloroethene	0.98 J	0.98	1	COE-MW-04
Trichloroethene	< 20 U	20	0	COE-MW-04
Trichloroethene	< 0.5 U	0.5	0	COE-MW-05
Trichloroethene	< 0.5 U	0.5	0	COE-MW-05
Trichloroethene	< 0.5 U	0.5	0	COE-MW-05

Constituent	Original Data	Result	D_Result	Location ID
Trichloroethene	< 1 U	1	0	COE-MW-05
Trichloroethene	< 0.5 U	0.5	0	COE-MW-06
Trichloroethene	< 0.5 U	0.5	0	COE-MW-06
Trichloroethene	< 10 U	10	0	COE-MW-06
Trichloroethene	< 10 U	10	0	COE-MW-07
Trichloroethene	0.59	0.59	1	COE-MW-07
Trichloroethene	< 5 U	5	0	COE-MW-07
Trichloroethene	< 10 U	10	0	COE-MW-07
Trichloroethene	< 0.5 U	0.5	0	COE-MW-08
Trichloroethene	< 0.5 U	0.5	0	COE-MW-08
Trichloroethene	< 0.5 U	0.5	0	COE-MW-08
Trichloroethene	< 20 U	20	0	COE-MW-08
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-09
Trichloroethene	< 1 U	1	0	HA01-MW-09
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-10
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-10
Trichloroethene	< 1 U	1	0	HA01-MW-10
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-11
Trichloroethene	< 1 U	1	0	HA01-MW-11
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-12
Trichloroethene	< 1 U	1	0	HA01-MW-12
Trichloroethene	< 1 U	1	0	HA01-MW-12
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-12D
Trichloroethene	< 1 U	1	0	HA01-MW-12D
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-13
Trichloroethene	< 1 U	1	0	HA01-MW-13
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-14
Trichloroethene	< 1 U	1	0	HA01-MW-14
Trichloroethene	< 1 U	1	0	HA01-MW-14
Trichloroethene	< 1 U	1	0	HA01-MW-14 (Rep)
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-14D
Trichloroethene	< 1 U	1	0	HA01-MW-14D
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-15
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-15
Trichloroethene	< 1 U	1	0	HA01-MW-15
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-16
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-17
Trichloroethene	< 1 U	1	0	HA01-MW-17
Trichloroethene	< 0.5 U	0.5	0	HA01-MW-18D
Trichloroethene	< 0.5 U	0.5	0	HMW-02
Trichloroethene	< 0.5 U	0.5	0	HMW-02
Trichloroethene	< 1 U	1	0	HMW-02
Trichloroethene	< 0.5 U	0.5	0	HMW-04
Trichloroethene	< 0.5 U	0.5	0	HMW-04
Trichloroethene	< 1 U	1	0	HMW-04
Trichloroethene	< 0.5 U	0.5	0	HMW-06
Trichloroethene	< 0.5 U	0.5	0	HMW-06
Trichloroethene	< 1 U	1	0	HMW-06
Trichloroethene	< 0.5 U	0.5	0	HMW-08
Trichloroethene	< 0.5 U	0.5	0	HMW-08
Trichloroethene	< 1 U	1	0	HMW-08
Trichloroethene	< 0.5 U	0.5	0	HMW-09
Trichloroethene	< 0.5 U	0.5	0	HMW-09
Trichloroethene	< 0.5 U	0.5	0	HMW-09
Trichloroethene	< 1 U	1	0	HMW-09
Trichloroethene	< 0.5 U	0.5	0	HMW-10
Trichloroethene	< 0.5 U	0.5	0	HMW-10
Trichloroethene	< 1 U	1	0	HMW-10
Trichloroethene	< 0.5 U	0.5	0	HMW-11
Trichloroethene	< 0.5 U	0.5	0	HMW-11
Trichloroethene	< 1 U	1	0	HMW-11
Trichloroethene	< 0.5 U	0.5	0	HMW-13
Trichloroethene	< 0.5 U	0.5	0	HMW-13
Trichloroethene	< 0.5 U	0.5	0	HMW-13
Trichloroethene	< 1 U	1	0	HMW-13
Trichloroethene	< 1 U	1	0	HMW-13 (Rep)
Trichloroethene	1.3	1.3	1	HMW-14R
Trichloroethene	1.5	1.5	1	HMW-14R
Trichloroethene	0.3 J	0.3	1	HMW-14R
Trichloroethene	< 0.5 U	0.5	0	HMW-21
Trichloroethene	< 2 U	2	0	HMW-21
Trichloroethene	< 5 U	5	0	HMW-21

Constituent	Original Data	Result	D_Result	Location ID
Trichloroethene	< 20 U	20	0	HMW-21
Trichloroethene	< 0.5 U	0.5	0	HMW-23
Trichloroethene	< 0.5 U	0.5	0	HMW-23
Trichloroethene	< 1 U	1	0	HMW-23
Trichloroethene	< 0.5 U	0.5	0	HMW-24
Trichloroethene	< 0.5 U	0.5	0	HMW-24
Trichloroethene	< 1 U	1	0	HMW-24
Vinyl chloride	2.8	2.8	1	COE-MW-01
Vinyl chloride	< 0.5 U	0.5	0	COE-MW-01
Vinyl chloride	< 1 U	1	0	COE-MW-01
Vinyl chloride	3.1	3.1	1	COE-MW-02
Vinyl chloride	1.8	1.8	1	COE-MW-02
Vinyl chloride	0.31 J	0.31	1	COE-MW-02
Vinyl chloride	1000	1000	1	COE-MW-03
Vinyl chloride	1000	1000	1	COE-MW-03
Vinyl chloride	700 J	700	1	COE-MW-03
Vinyl chloride	120	120	1	COE-MW-03
Vinyl chloride	73	73	1	COE-MW-04
Vinyl chloride	86	86	1	COE-MW-04
Vinyl chloride	59	59	1	COE-MW-04
Vinyl chloride	3.5	3.5	1	COE-MW-05
Vinyl chloride	0.75	0.75	1	COE-MW-05
Vinyl chloride	5.5	5.5	1	COE-MW-05
Vinyl chloride	9.6	9.6	1	COE-MW-05
Vinyl chloride	1.4	1.4	1	COE-MW-06
Vinyl chloride	< 0.5 U	0.5	0	COE-MW-06
Vinyl chloride	2.1 J	2.1	1	COE-MW-06
Vinyl chloride	< 10 U	10	0	COE-MW-07
Vinyl chloride	< 0.5 U	0.5	0	COE-MW-07
Vinyl chloride	< 5 UJ	5	0	COE-MW-07
Vinyl chloride	< 10 U	10	0	COE-MW-07
Vinyl chloride	< 0.5 U	0.5	0	COE-MW-08
Vinyl chloride	< 0.5 U	0.5	0	COE-MW-08
Vinyl chloride	< 0.5 U	0.5	0	COE-MW-08
Vinyl chloride	< 20 U	20	0	COE-MW-08
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-09
Vinyl chloride	< 1 U	1	0	HA01-MW-09
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-10
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-10
Vinyl chloride	< 1 U	1	0	HA01-MW-10
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-11
Vinyl chloride	< 1 U	1	0	HA01-MW-11
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-12
Vinyl chloride	< 1 U	1	0	HA01-MW-12
Vinyl chloride	< 1 U	1	0	HA01-MW-12
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-12D
Vinyl chloride	< 1 U	1	0	HA01-MW-12D
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-13
Vinyl chloride	< 1 U	1	0	HA01-MW-13
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-14
Vinyl chloride	< 1 U	1	0	HA01-MW-14
Vinyl chloride	< 1 U	1	0	HA01-MW-14
Vinyl chloride	< 1 U	1	0	HA01-MW-14 (Rep)
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-14D
Vinyl chloride	< 1 U	1	0	HA01-MW-14D
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-15
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-15
Vinyl chloride	< 1 U	1	0	HA01-MW-15
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-16
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-17
Vinyl chloride	< 1 U	1	0	HA01-MW-17
Vinyl chloride	< 0.5 U	0.5	0	HA01-MW-18D
Vinyl chloride	< 0.5 U	0.5	0	HMW-02
Vinyl chloride	< 0.5 U	0.5	0	HMW-02
Vinyl chloride	< 1 U	1	0	HMW-02
Vinyl chloride	< 0.5 U	0.5	0	HMW-04
Vinyl chloride	< 0.5 U	0.5	0	HMW-04
Vinyl chloride	< 1 U	1	0	HMW-04
Vinyl chloride	0.32 J	0.32	1	HMW-06
Vinyl chloride	< 0.5 U	0.5	0	HMW-06
Vinyl chloride	0.34 J	0.34	1	HMW-06
Vinyl chloride	< 0.5 U	0.5	0	HMW-08

Constituent	Original Data	Result	D_Result	Location ID
Vinyl chloride	< 0.5 U	0.5	0	HMW-08
Vinyl chloride	< 1 U	1	0	HMW-08
Vinyl chloride	< 0.5 U	0.5	0	HMW-09
Vinyl chloride	< 0.5 U	0.5	0	HMW-09
Vinyl chloride	< 0.5 U	0.5	0	HMW-09
Vinyl chloride	< 1 U	1	0	HMW-09
Vinyl chloride	0.6	0.6	1	HMW-10
Vinyl chloride	< 0.5 U	0.5	0	HMW-10
Vinyl chloride	0.23 J	0.23	1	HMW-10
Vinyl chloride	< 0.5 U	0.5	0	HMW-11
Vinyl chloride	< 0.5 U	0.5	0	HMW-11
Vinyl chloride	< 1 U	1	0	HMW-11
Vinyl chloride	< 0.5 U	0.5	0	HMW-13
Vinyl chloride	< 0.5 U	0.5	0	HMW-13
Vinyl chloride	< 0.5 U	0.5	0	HMW-13
Vinyl chloride	< 1 U	1	0	HMW-13
Vinyl chloride	< 1 U	1	0	HMW-13 (Rep)
Vinyl chloride	1.4	1.4	1	HMW-14R
Vinyl chloride	1.3	1.3	1	HMW-14R
Vinyl chloride	< 1 U	1	0	HMW-14R
Vinyl chloride	0.13 J	0.13	1	HMW-21
Vinyl chloride	< 2 U	2	0	HMW-21
Vinyl chloride	36 J	36	1	HMW-21
Vinyl chloride	20	20	1	HMW-21
Vinyl chloride	< 0.5 U	0.5	0	HMW-23
Vinyl chloride	< 0.5 U	0.5	0	HMW-23
Vinyl chloride	< 1 U	1	0	HMW-23
Vinyl chloride	< 0.5 U	0.5	0	HMW-24
Vinyl chloride	< 0.5 U	0.5	0	HMW-24
Vinyl chloride	< 1 U	1	0	HMW-24
Xylenes (total)	3	3	1	COE-MW-01
Xylenes (total)	2.6	2.6	1	COE-MW-01
Xylenes (total)	< 1 U	1	0	COE-MW-01
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-02
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-02
Xylenes (total)	< 1 U	1	0	COE-MW-02
Xylenes (total)	< 25 U	25	0	COE-MW-03
Xylenes (total)	< 2.5 U	2.5	0	COE-MW-03
Xylenes (total)	< 25 U	25	0	COE-MW-03
Xylenes (total)	< 20 U	20	0	COE-MW-03
Xylenes (total)	< 5 U	5	0	COE-MW-04
Xylenes (total)	1.1	1.1	1	COE-MW-04
Xylenes (total)	< 20 U	20	0	COE-MW-04
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-05
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-05
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-05
Xylenes (total)	< 1 U	1	0	COE-MW-05
Xylenes (total)	0.19 J	0.19	1	COE-MW-06
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-06
Xylenes (total)	< 10 U	10	0	COE-MW-06
Xylenes (total)	< 10 U	10	0	COE-MW-07
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-07
Xylenes (total)	< 5 U	5	0	COE-MW-07
Xylenes (total)	< 10 U	10	0	COE-MW-07
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-08
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-08
Xylenes (total)	< 0.5 U	0.5	0	COE-MW-08
Xylenes (total)	< 20 U	20	0	COE-MW-08
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-09
Xylenes (total)	< 1 U	1	0	HA01-MW-09
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-10
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-10
Xylenes (total)	< 1 U	1	0	HA01-MW-10
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-11
Xylenes (total)	< 1 U	1	0	HA01-MW-11
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-12
Xylenes (total)	< 1 U	1	0	HA01-MW-12
Xylenes (total)	< 1 U	1	0	HA01-MW-12
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-12D
Xylenes (total)	< 1 U	1	0	HA01-MW-12D
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-13
Xylenes (total)	< 1 U	1	0	HA01-MW-13

Constituent	Original Data	Result	D_Result	Location ID
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-14
Xylenes (total)	< 1 U	1	0	HA01-MW-14
Xylenes (total)	< 1 U	1	0	HA01-MW-14
Xylenes (total)	< 1 U	1	0	HA01-MW-14 (Rep)
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-14D
Xylenes (total)	< 1 U	1	0	HA01-MW-14D
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-15
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-15
Xylenes (total)	< 1 U	1	0	HA01-MW-15
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-16
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-17
Xylenes (total)	< 1 U	1	0	HA01-MW-17
Xylenes (total)	< 0.5 U	0.5	0	HA01-MW-18D
Xylenes (total)	< 0.5 U	0.5	0	HMW-02
Xylenes (total)	< 0.5 U	0.5	0	HMW-02
Xylenes (total)	< 1 U	1	0	HMW-02
Xylenes (total)	< 0.5 U	0.5	0	HMW-04
Xylenes (total)	< 0.5 U	0.5	0	HMW-04
Xylenes (total)	< 1 U	1	0	HMW-04
Xylenes (total)	0.32 J	0.32	1	HMW-06
Xylenes (total)	< 0.5 U	0.5	0	HMW-06
Xylenes (total)	< 1 U	1	0	HMW-06
Xylenes (total)	< 0.5 U	0.5	0	HMW-08
Xylenes (total)	< 0.5 U	0.5	0	HMW-08
Xylenes (total)	< 1 U	1	0	HMW-08
Xylenes (total)	0.46 J	0.46	1	HMW-09
Xylenes (total)	< 0.5 U	0.5	0	HMW-09
Xylenes (total)	0.51	0.51	1	HMW-09
Xylenes (total)	< 1 U	1	0	HMW-09
Xylenes (total)	0.69	0.69	1	HMW-10
Xylenes (total)	< 0.5 U	0.5	0	HMW-10
Xylenes (total)	0.62 J	0.62	1	HMW-10
Xylenes (total)	0.21 J	0.21	1	HMW-11
Xylenes (total)	< 0.5 U	0.5	0	HMW-11
Xylenes (total)	< 1 U	1	0	HMW-11
Xylenes (total)	38	38	1	HMW-13
Xylenes (total)	61	61	1	HMW-13
Xylenes (total)	0.87	0.87	1	HMW-13
Xylenes (total)	0.81 J	0.81	1	HMW-13
Xylenes (total)	0.81 J	0.81	1	HMW-13 (Rep)
Xylenes (total)	0.62 J	0.62	1	HMW-14R
Xylenes (total)	< 0.5 U	0.5	0	HMW-14R
Xylenes (total)	< 1 U	1	0	HMW-14R
Xylenes (total)	< 0.5 U	0.5	0	HMW-21
Xylenes (total)	< 2 U	2	0	HMW-21
Xylenes (total)	< 5 U	5	0	HMW-21
Xylenes (total)	< 20 U	20	0	HMW-21
Xylenes (total)	< 0.5 U	0.5	0	HMW-23
Xylenes (total)	< 0.5 U	0.5	0	HMW-23
Xylenes (total)	< 1 U	1	0	HMW-23
Xylenes (total)	47	47	1	HMW-24
Xylenes (total)	< 0.5 U	0.5	0	HMW-24
Xylenes (total)	0.35 J	0.35	1	HMW-24

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.14/19/2019 11:20:48 AM
From File	RI-FS Appendix A - ALL Groundwater Analytical Results_2009-2014.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result (2-hexanone)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	19
Number of Detects	15	Number of Non-Detects	80
Number of Distinct Detects	13	Number of Distinct Non-Detects	6
Minimum Detect	0.3	Minimum Non-Detect	10
Maximum Detect	11	Maximum Non-Detect	500
Variance Detects	9.502	Percent Non-Detects	84.21%
Mean Detects	3.192	SD Detects	3.082
Median Detects	2.5	CV Detects	0.966
Skewness Detects	1.254	Kurtosis Detects	1.392
Mean of Logged Detects	0.624	SD of Logged Detects	1.173

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.855	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.738	KM Standard Error of Mean	0.61
KM SD	2.373	95% KM (BCA) UCL	3.789
95% KM (t) UCL	3.751	95% KM (Percentile Bootstrap) UCL	3.728
95% KM (z) UCL	3.741	95% KM Bootstrap t UCL	3.999
90% KM Chebyshev UCL	4.568	95% KM Chebyshev UCL	5.397
97.5% KM Chebyshev UCL	6.548	99% KM Chebyshev UCL	8.809

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.346	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.167	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.228	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.067	k star (bias corrected MLE)	0.898
Theta hat (MLE)	2.992	Theta star (bias corrected MLE)	3.555
nu hat (MLE)	32.01	nu star (bias corrected)	26.94
Mean (detects)	3.192		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.3	Mean	2.702
Maximum	11	Median	2.134
SD	2.06	CV	0.762
k hat (MLE)	1.91	k star (bias corrected MLE)	1.857
Theta hat (MLE)	1.415	Theta star (bias corrected MLE)	1.455
nu hat (MLE)	363	nu star (bias corrected)	352.8
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (352.82, α)	310.3	Adjusted Chi Square Value (352.82, β)	309.7
95% Gamma Approximate UCL (use when n>=50)	3.073	95% Gamma Adjusted UCL (use when n<50)	3.079

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.738	SD (KM)	2.373
Variance (KM)	5.63	SE of Mean (KM)	0.61
k hat (KM)	1.331	k star (KM)	1.296
nu hat (KM)	252.9	nu star (KM)	246.3
theta hat (KM)	2.056	theta star (KM)	2.112
80% gamma percentile (KM)	4.302	90% gamma percentile (KM)	5.912
95% gamma percentile (KM)	7.492	99% gamma percentile (KM)	11.09

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (246.28, α)	210.9	Adjusted Chi Square Value (246.28, β)	210.4
95% Gamma Approximate KM-UCL (use when n>=50)	3.196	95% Gamma Adjusted KM-UCL (use when n<50)	3.204

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.138	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.22	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.484	Mean in Log Scale	0.472
SD in Original Scale	2.46	SD in Log Scale	0.974
95% t UCL (assumes normality of ROS data)	2.903	95% Percentile Bootstrap UCL	2.937
95% BCA Bootstrap UCL	2.961	95% Bootstrap t UCL	2.966
95% H-UCL (Log ROS)	3.22		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.52	KM Geo Mean	1.683
KM SD (logged)	1.079	95% Critical H Value (KM-Log)	2.328
KM Standard Error of Mean (logged)	0.292	95% H-UCL (KM -Log)	3.903
KM SD (logged)	1.079	95% Critical H Value (KM-Log)	2.328
KM Standard Error of Mean (logged)	0.292		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	17.61	Mean in Log Scale	1.847
SD in Original Scale	41.39	SD in Log Scale	1.198
95% t UCL (Assumes normality)	24.66	95% H-Stat UCL	17.6

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 3.751

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (2-methylnaphthalene)

General Statistics

Total Number of Observations	35	Number of Distinct Observations	18
Number of Detects	10	Number of Non-Detects	25
Number of Distinct Detects	9	Number of Distinct Non-Detects	9
Minimum Detect	0.21	Minimum Non-Detect	1
Maximum Detect	22	Maximum Non-Detect	10
Variance Detects	62.71	Percent Non-Detects	71.43%
Mean Detects	10.66	SD Detects	7.919
Median Detects	9.5	CV Detects	0.743
Skewness Detects	0.194	Kurtosis Detects	-1.044
Mean of Logged Detects	1.723	SD of Logged Detects	1.642

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.148	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.555	KM Standard Error of Mean	1.137
KM SD	6.135	95% KM (BCA) UCL	5.637
95% KM (t) UCL	5.478	95% KM (Percentile Bootstrap) UCL	5.465
95% KM (z) UCL	5.425	95% KM Bootstrap t UCL	5.875
90% KM Chebyshev UCL	6.966	95% KM Chebyshev UCL	8.512
97.5% KM Chebyshev UCL	10.66	99% KM Chebyshev UCL	14.87

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.683	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.268	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.275	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.907	k star (bias corrected MLE)	0.702
Theta hat (MLE)	11.75	Theta star (bias corrected MLE)	15.19
nu hat (MLE)	18.14	nu star (bias corrected)	14.03
Mean (detects)	10.66		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.742
Maximum	22	Median	0.62
SD	6.15	CV	1.643
k hat (MLE)	0.288	k star (bias corrected MLE)	0.282
Theta hat (MLE)	12.99	Theta star (bias corrected MLE)	13.25
nu hat (MLE)	20.16	nu star (bias corrected)	19.77
Adjusted Level of Significance (β)	0.0425		
Approximate Chi Square Value (19.77, α)	10.68	Adjusted Chi Square Value (19.77, β)	10.36
95% Gamma Approximate UCL (use when n>=50)	6.927	95% Gamma Adjusted UCL (use when n<50)	7.139

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.555	SD (KM)	6.135
Variance (KM)	37.64	SE of Mean (KM)	1.137
k hat (KM)	0.336	k star (KM)	0.326
nu hat (KM)	23.51	nu star (KM)	22.82
theta hat (KM)	10.59	theta star (KM)	10.9
80% gamma percentile (KM)	5.555	90% gamma percentile (KM)	10.37
95% gamma percentile (KM)	15.83	99% gamma percentile (KM)	29.86

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.82, α)	12.96	Adjusted Chi Square Value (22.82, β)	12.6
95% Gamma Approximate KM-UCL (use when n>=50)	6.262	95% Gamma Adjusted KM-UCL (use when n<50)	6.437

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.774	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.306	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.559	Mean in Log Scale	-0.017
SD in Original Scale	6.136	SD in Log Scale	1.611

95% t UCL (assumes normality of ROS data)	5.312	95% Percentile Bootstrap UCL	5.446
95% BCA Bootstrap UCL	5.664	95% Bootstrap t UCL	5.951
95% H-UCL (Log ROS)	8.952		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.211	KM Geo Mean	0.81
KM SD (logged)	1.648	95% Critical H Value (KM-Log)	3.349
KM Standard Error of Mean (logged)	0.39	95% H-UCL (KM -Log)	8.106
KM SD (logged)	1.648	95% Critical H Value (KM-Log)	3.349
KM Standard Error of Mean (logged)	0.39		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.762	Mean in Log Scale	0.96
SD in Original Scale	5.662	SD in Log Scale	1.178
95% t UCL (Assumes normality)	6.38	95% H-Stat UCL	8.99

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	5.478

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (aldrin)

General Statistics

Total Number of Observations	46	Number of Distinct Observations	19
Number of Detects	13	Number of Non-Detects	33
Number of Distinct Detects	13	Number of Distinct Non-Detects	6
Minimum Detect	0.0018	Minimum Non-Detect	0.025
Maximum Detect	4.6	Maximum Non-Detect	0.25
Variance Detects	1.57	Percent Non-Detects	71.74%
Mean Detects	0.555	SD Detects	1.253
Median Detects	0.082	CV Detects	2.259
Skewness Detects	3.262	Kurtosis Detects	11.09
Mean of Logged Detects	-2.58	SD of Logged Detects	2.344

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.492	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.866	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.33	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.234	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.161	KM Standard Error of Mean	0.105
KM SD	0.686	95% KM (BCA) UCL	0.36
95% KM (t) UCL	0.338	95% KM (Percentile Bootstrap) UCL	0.36
95% KM (z) UCL	0.334	95% KM Bootstrap t UCL	1.005
90% KM Chebyshev UCL	0.477	95% KM Chebyshev UCL	0.62
97.5% KM Chebyshev UCL	0.818	99% KM Chebyshev UCL	1.208

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.483	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.822	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.175	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.255	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.34	k star (bias corrected MLE)	0.312
Theta hat (MLE)	1.633	Theta star (bias corrected MLE)	1.775
nu hat (MLE)	8.828	nu star (bias corrected)	8.124
Mean (detects)	0.555		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0018	Mean	0.164
Maximum	4.6	Median	0.01
SD	0.693	CV	4.227
k hat (MLE)	0.309	k star (bias corrected MLE)	0.303
Theta hat (MLE)	0.531	Theta star (bias corrected MLE)	0.541
nu hat (MLE)	28.39	nu star (bias corrected)	27.87
Adjusted Level of Significance (β)	0.0448		
Approximate Chi Square Value (27.87, α)	16.83	Adjusted Chi Square Value (27.87, β)	16.55
95% Gamma Approximate UCL (use when n>=50)	0.271	95% Gamma Adjusted UCL (use when n<50)	0.276

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.161	SD (KM)	0.686
Variance (KM)	0.471	SE of Mean (KM)	0.105
k hat (KM)	0.0549	k star (KM)	0.0658
nu hat (KM)	5.048	nu star (KM)	6.052
theta hat (KM)	2.929	theta star (KM)	2.443
80% gamma percentile (KM)	0.0496	90% gamma percentile (KM)	0.329
95% gamma percentile (KM)	0.916	99% gamma percentile (KM)	3.114

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.05, α)	1.667	Adjusted Chi Square Value (6.05, β)	1.594
95% Gamma Approximate KM-UCL (use when n>=50)	0.584	95% Gamma Adjusted KM-UCL (use when n<50)	0.61

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.139	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.234	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.164	Mean in Log Scale	-4.658

SD in Original Scale	0.693	SD in Log Scale	2.195
95% t UCL (assumes normality of ROS data)	0.335	95% Percentile Bootstrap UCL	0.357
95% BCA Bootstrap UCL	0.517	95% Bootstrap t UCL	1.046
95% H-UCL (Log ROS)	0.373		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.597	KM Geo Mean	0.0101
KM SD (logged)	1.815	95% Critical H Value (KM-Log)	3.328
KM Standard Error of Mean (logged)	0.359	95% H-UCL (KM -Log)	0.129
KM SD (logged)	1.815	95% Critical H Value (KM-Log)	3.328
KM Standard Error of Mean (logged)	0.359		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.168	Mean in Log Scale	-3.798
SD in Original Scale	0.692	SD in Log Scale	1.475
95% t UCL (Assumes normality)	0.34	95% H-Stat UCL	0.125

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

ıma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (arsenictotal)

General Statistics

Total Number of Observations	61	Number of Distinct Observations	6
Number of Detects	6	Number of Non-Detects	55
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	4.7	Minimum Non-Detect	10
Maximum Detect	6.7	Maximum Non-Detect	10
Variance Detects	0.718	Percent Non-Detects	90.16%
Mean Detects	5.483	SD Detects	0.847
Median Detects	5.25	CV Detects	0.154
Skewness Detects	0.523	Kurtosis Detects	-1.806
Mean of Logged Detects	1.692	SD of Logged Detects	0.152

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.861	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.29	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.483	KM Standard Error of Mean	0.346
KM SD	0.773	95% KM (BCA) UCL	6.1
95% KM (t) UCL	6.061	95% KM (Percentile Bootstrap) UCL	6.05
95% KM (z) UCL	6.052	95% KM Bootstrap t UCL	6.378
90% KM Chebyshev UCL	6.521	95% KM Chebyshev UCL	6.991
97.5% KM Chebyshev UCL	7.643	99% KM Chebyshev UCL	8.924

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.512	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.697	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.313	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.332	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	51.57	k star (bias corrected MLE)	25.9
Theta hat (MLE)	0.106	Theta star (bias corrected MLE)	0.212
nu hat (MLE)	618.8	nu star (bias corrected)	310.8
Mean (detects)	5.483		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.481	Mean	5.5
Maximum	7.865	Median	5.459
SD	0.968	CV	0.176
k hat (MLE)	32.5	k star (bias corrected MLE)	30.91
Theta hat (MLE)	0.169	Theta star (bias corrected MLE)	0.178
nu hat (MLE)	3965	nu star (bias corrected)	3771
Adjusted Level of Significance (β)	0.0461		
Approximate Chi Square Value (N/A, α)	3629	Adjusted Chi Square Value (N/A, β)	3626
95% Gamma Approximate UCL (use when n>=50)	5.715	95% Gamma Adjusted UCL (use when n<50)	5.72

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.483	SD (KM)	0.773
Variance (KM)	0.598	SE of Mean (KM)	0.346
k hat (KM)	50.27	k star (KM)	47.81
nu hat (KM)	6133	nu star (KM)	5833
theta hat (KM)	0.109	theta star (KM)	0.115
80% gamma percentile (KM)	6.137	90% gamma percentile (KM)	6.521
95% gamma percentile (KM)	6.85	99% gamma percentile (KM)	7.495

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	5657	Adjusted Chi Square Value (N/A, β)	5652
95% Gamma Approximate KM-UCL (use when n>=50)	5.654	95% Gamma Adjusted KM-UCL (use when n<50)	5.659

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.292	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.51	Mean in Log Scale	1.692
SD in Original Scale	0.954	SD in Log Scale	0.172

95% t UCL (assumes normality of ROS data)	5.714	95% Percentile Bootstrap UCL	5.716
95% BCA Bootstrap UCL	5.708	95% Bootstrap t UCL	5.718
95% H-UCL (Log ROS)	5.724		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.692	KM Geo Mean	5.43
KM SD (logged)	0.139	95% Critical H Value (KM-Log)	1.69
KM Standard Error of Mean (logged)	0.062	95% H-UCL (KM -Log)	5.651
KM SD (logged)	0.139	95% Critical H Value (KM-Log)	1.69
KM Standard Error of Mean (logged)	0.062		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.048	Mean in Log Scale	1.618
SD in Original Scale	0.284	SD in Log Scale	0.0504
95% t UCL (Assumes normality)	5.108	95% H-Stat UCL	N/A

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	6.061

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzene)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	45
Number of Detects	41	Number of Non-Detects	54
Number of Distinct Detects	40	Number of Distinct Non-Detects	5
Minimum Detect	0.16	Minimum Non-Detect	0.5
Maximum Detect	140	Maximum Non-Detect	20
Variance Detects	627.1	Percent Non-Detects	56.84%
Mean Detects	12.07	SD Detects	25.04
Median Detects	2.4	CV Detects	2.075
Skewness Detects	3.791	Kurtosis Detects	17.17
Mean of Logged Detects	0.986	SD of Logged Detects	1.817

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.526	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.941	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.317	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.137	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.463	KM Standard Error of Mean	1.794
KM SD	17.26	95% KM (BCA) UCL	8.849
95% KM (t) UCL	8.444	95% KM (Percentile Bootstrap) UCL	8.609
95% KM (z) UCL	8.414	95% KM Bootstrap t UCL	11.29
90% KM Chebyshev UCL	10.85	95% KM Chebyshev UCL	13.28
97.5% KM Chebyshev UCL	16.67	99% KM Chebyshev UCL	23.32

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.68	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.829	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.201	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.147	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.432	k star (bias corrected MLE)	0.417
Theta hat (MLE)	27.94	Theta star (bias corrected MLE)	28.97
nu hat (MLE)	35.43	nu star (bias corrected)	34.17
Mean (detects)	12.07		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.227
Maximum	140	Median	0.01
SD	17.4	CV	3.329
k hat (MLE)	0.195	k star (bias corrected MLE)	0.196
Theta hat (MLE)	26.85	Theta star (bias corrected MLE)	26.73
nu hat (MLE)	36.99	nu star (bias corrected)	37.15
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (37.15, α)	24.2	Adjusted Chi Square Value (37.15, β)	24.04
95% Gamma Approximate UCL (use when n>=50)	8.025	95% Gamma Adjusted UCL (use when n<50)	8.078

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.463	SD (KM)	17.26
Variance (KM)	297.8	SE of Mean (KM)	1.794
k hat (KM)	0.1	k star (KM)	0.104
nu hat (KM)	19.04	nu star (KM)	19.77
theta hat (KM)	54.52	theta star (KM)	52.5
80% gamma percentile (KM)	4.01	90% gamma percentile (KM)	14.77
95% gamma percentile (KM)	31.62	99% gamma percentile (KM)	85.06

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (19.77, α)	10.68	Adjusted Chi Square Value (19.77, β)	10.58
95% Gamma Approximate KM-UCL (use when n>=50)	10.11	95% Gamma Adjusted KM-UCL (use when n<50)	10.21

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.941	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0887	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.137	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.484	Mean in Log Scale	-0.308
SD in Original Scale	17.33	SD in Log Scale	1.875

95% t UCL (assumes normality of ROS data)	8.437	95% Percentile Bootstrap UCL	8.638
95% BCA Bootstrap UCL	9.909	95% Bootstrap t UCL	11.45
95% H-UCL (Log ROS)	7.993		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.226	KM Geo Mean	0.798
KM SD (logged)	1.645	95% Critical H Value (KM-Log)	2.962
KM Standard Error of Mean (logged)	0.187	95% H-UCL (KM -Log)	5.101
KM SD (logged)	1.645	95% Critical H Value (KM-Log)	2.962
KM Standard Error of Mean (logged)	0.187		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.883	Mean in Log Scale	0.0117
SD in Original Scale	17.31	SD in Log Scale	1.661
95% t UCL (Assumes normality)	8.833	95% H-Stat UCL	6.701

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	5.101

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzene, 1-methylethyl)

General Statistics

Total Number of Observations	61	Number of Distinct Observations	20
Number of Detects	11	Number of Non-Detects	50
Number of Distinct Detects	11	Number of Distinct Non-Detects	9
Minimum Detect	3.1	Minimum Non-Detect	0.1
Maximum Detect	86	Maximum Non-Detect	25
Variance Detects	805.2	Percent Non-Detects	81.97%
Mean Detects	29.65	SD Detects	28.38
Median Detects	19	CV Detects	0.957
Skewness Detects	0.957	Kurtosis Detects	-0.178
Mean of Logged Detects	2.844	SD of Logged Detects	1.193

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.473	KM Standard Error of Mean	2.171
KM SD	16.16	95% KM (BCA) UCL	9.403
95% KM (t) UCL	9.1	95% KM (Percentile Bootstrap) UCL	9.094
95% KM (z) UCL	9.044	95% KM Bootstrap t UCL	11.59
90% KM Chebyshev UCL	11.99	95% KM Chebyshev UCL	14.94
97.5% KM Chebyshev UCL	19.03	99% KM Chebyshev UCL	27.08

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.294	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.751	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.173	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.262	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.053	k star (bias corrected MLE)	0.827
Theta hat (MLE)	28.15	Theta star (bias corrected MLE)	35.87
nu hat (MLE)	23.17	nu star (bias corrected)	18.18
Mean (detects)	29.65		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.354
Maximum	86	Median	0.01
SD	16.31	CV	3.047
k hat (MLE)	0.155	k star (bias corrected MLE)	0.158
Theta hat (MLE)	34.57	Theta star (bias corrected MLE)	33.85
nu hat (MLE)	18.89	nu star (bias corrected)	19.3
Adjusted Level of Significance (β)	0.0461		
Approximate Chi Square Value (19.30, α)	10.34	Adjusted Chi Square Value (19.30, β)	10.18
95% Gamma Approximate UCL (use when n>=50)	9.997	95% Gamma Adjusted UCL (use when n<50)	10.15

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.473	SD (KM)	16.16
Variance (KM)	261	SE of Mean (KM)	2.171
k hat (KM)	0.115	k star (KM)	0.12
nu hat (KM)	14	nu star (KM)	14.64
theta hat (KM)	47.69	theta star (KM)	45.59
80% gamma percentile (KM)	4.801	90% gamma percentile (KM)	15.51
95% gamma percentile (KM)	31.23	99% gamma percentile (KM)	79.21

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.64, α)	7.015	Adjusted Chi Square Value (14.64, β)	6.887
95% Gamma Approximate KM-UCL (use when n>=50)	11.42	95% Gamma Adjusted KM-UCL (use when n<50)	11.64

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.149	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.718	Mean in Log Scale	-1.097
SD in Original Scale	16.21	SD in Log Scale	2.544

95% t UCL (assumes normality of ROS data)	9.185	95% Percentile Bootstrap UCL	9.399
95% BCA Bootstrap UCL	10.42	95% Bootstrap t UCL	11.47
95% H-UCL (Log ROS)	26.83		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.346	KM Geo Mean	0.26
KM SD (logged)	2.052	95% Critical H Value (KM-Log)	3.188
KM Standard Error of Mean (logged)	0.279	95% H-UCL (KM -Log)	4.97
KM SD (logged)	2.052	95% Critical H Value (KM-Log)	3.188
KM Standard Error of Mean (logged)	0.279		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	6.172	Mean in Log Scale	-0.309
SD in Original Scale	16.21	SD in Log Scale	1.852
95% t UCL (Assumes normality)	9.638	95% H-Stat UCL	8.255

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	9.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (chromiumtotal)

General Statistics

Total Number of Observations	52	Number of Distinct Observations	18
Number of Detects	10	Number of Non-Detects	42
Number of Distinct Detects	9	Number of Distinct Non-Detects	9
Minimum Detect	2.6	Minimum Non-Detect	2.2
Maximum Detect	250	Maximum Non-Detect	7.3
Variance Detects	5957	Percent Non-Detects	80.77%
Mean Detects	30.46	SD Detects	77.18
Median Detects	6.05	CV Detects	2.534
Skewness Detects	3.155	Kurtosis Detects	9.968
Mean of Logged Detects	2.084	SD of Logged Detects	1.292

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.397	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.505	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	8.149	KM Standard Error of Mean	4.962
KM SD	33.91	95% KM (BCA) UCL	18.34
95% KM (t) UCL	16.46	95% KM (Percentile Bootstrap) UCL	17.58
95% KM (z) UCL	16.31	95% KM Bootstrap t UCL	93.2
90% KM Chebyshev UCL	23.04	95% KM Chebyshev UCL	29.78
97.5% KM Chebyshev UCL	39.14	99% KM Chebyshev UCL	57.52

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.157	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.781	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.457	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.282	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.48	k star (bias corrected MLE)	0.402
Theta hat (MLE)	63.51	Theta star (bias corrected MLE)	75.69
nu hat (MLE)	9.593	nu star (bias corrected)	8.048
Mean (detects)	30.46		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.633
Maximum	250	Median	0.01
SD	34.66	CV	5.225
k hat (MLE)	0.159	k star (bias corrected MLE)	0.162
Theta hat (MLE)	41.8	Theta star (bias corrected MLE)	40.85
nu hat (MLE)	16.5	nu star (bias corrected)	16.88
Adjusted Level of Significance (β)	0.0454		
Approximate Chi Square Value (16.88, α)	8.59	Adjusted Chi Square Value (16.88, β)	8.42
95% Gamma Approximate UCL (use when n>=50)	13.04	95% Gamma Adjusted UCL (use when n<50)	13.3

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	8.149	SD (KM)	33.91
Variance (KM)	1150	SE of Mean (KM)	4.962
k hat (KM)	0.0577	k star (KM)	0.0672
nu hat (KM)	6.005	nu star (KM)	6.992
theta hat (KM)	141.1	theta star (KM)	121.2
80% gamma percentile (KM)	2.651	90% gamma percentile (KM)	17.02
95% gamma percentile (KM)	46.62	99% gamma percentile (KM)	156.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.99, α)	2.166	Adjusted Chi Square Value (6.99, β)	2.09
95% Gamma Approximate KM-UCL (use when n>=50)	26.31	95% Gamma Adjusted KM-UCL (use when n<50)	27.26

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.701	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.333	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	7.323	Mean in Log Scale	0.474
SD in Original Scale	34.41	SD in Log Scale	1.346

95% t UCL (assumes normality of ROS data)	15.32	95% Percentile Bootstrap UCL	16.92
95% BCA Bootstrap UCL	21.79	95% Bootstrap t UCL	85.61
95% H-UCL (Log ROS)	6.652		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.211	KM Geo Mean	3.357
KM SD (logged)	0.728	95% Critical H Value (KM-Log)	2.05
KM Standard Error of Mean (logged)	0.128	95% H-UCL (KM -Log)	5.391
KM SD (logged)	0.728	95% Critical H Value (KM-Log)	2.05
KM Standard Error of Mean (logged)	0.128		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	7.782	Mean in Log Scale	1.084
SD in Original Scale	34.3	SD in Log Scale	0.76
95% t UCL (Assumes normality)	15.75	95% H-Stat UCL	4.925

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	29.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (cis-1,2-dichloroethene)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	37
Number of Detects	41	Number of Non-Detects	54
Number of Distinct Detects	35	Number of Distinct Non-Detects	2
Minimum Detect	0.22	Minimum Non-Detect	0.5
Maximum Detect	9000	Maximum Non-Detect	1
Variance Detects	4822524	Percent Non-Detects	56.84%
Mean Detects	1211	SD Detects	2196
Median Detects	180	CV Detects	1.813
Skewness Detects	2.568	Kurtosis Detects	6.197
Mean of Logged Detects	4.835	SD of Logged Detects	2.981

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.595	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.941	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.291	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.137	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	522.9	KM Standard Error of Mean	160.6
KM SD	1546	95% KM (BCA) UCL	825.3
95% KM (t) UCL	789.7	95% KM (Percentile Bootstrap) UCL	812.7
95% KM (z) UCL	787	95% KM Bootstrap t UCL	929
90% KM Chebyshev UCL	1005	95% KM Chebyshev UCL	1223
97.5% KM Chebyshev UCL	1526	99% KM Chebyshev UCL	2121

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.437	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.858	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.106	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.15	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.304	k star (bias corrected MLE)	0.298
Theta hat (MLE)	3985	Theta star (bias corrected MLE)	4065
nu hat (MLE)	24.92	nu star (bias corrected)	24.43
Mean (detects)	1211		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	522.7
Maximum	9000	Median	0.01
SD	1554	CV	2.974
k hat (MLE)	0.117	k star (bias corrected MLE)	0.12
Theta hat (MLE)	4461	Theta star (bias corrected MLE)	4338
nu hat (MLE)	22.26	nu star (bias corrected)	22.89
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (22.89, α)	13.01	Adjusted Chi Square Value (22.89, β)	12.89
95% Gamma Approximate UCL (use when n>=50)	919.8	95% Gamma Adjusted UCL (use when n<50)	928

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	522.9	SD (KM)	1546
Variance (KM)	2390192	SE of Mean (KM)	160.6
k hat (KM)	0.114	k star (KM)	0.118
nu hat (KM)	21.73	nu star (KM)	22.38
theta hat (KM)	4571	theta star (KM)	4439
80% gamma percentile (KM)	448.9	90% gamma percentile (KM)	1474
95% gamma percentile (KM)	2991	99% gamma percentile (KM)	7642

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.38, α)	12.62	Adjusted Chi Square Value (22.38, β)	12.51
95% Gamma Approximate KM-UCL (use when n>=50)	927	95% Gamma Adjusted KM-UCL (use when n<50)	935.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.941	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.117	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.137	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	523.5	Mean in Log Scale	1.278
SD in Original Scale	1554	SD in Log Scale	4.141

95% t UCL (assumes normality of ROS data)	788.4	95% Percentile Bootstrap UCL	791.7
95% BCA Bootstrap UCL	866.1	95% Bootstrap t UCL	924.8
95% H-UCL (Log ROS)	285119		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.415	KM Geo Mean	4.115
KM SD (logged)	3.559	95% Critical H Value (KM-Log)	5.521
KM Standard Error of Mean (logged)	0.378	95% H-UCL (KM -Log)	17549
KM SD (logged)	3.559	95% Critical H Value (KM-Log)	5.521
KM Standard Error of Mean (logged)	0.378		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	522.9	Mean in Log Scale	1.445
SD in Original Scale	1554	SD in Log Scale	3.559
95% t UCL (Assumes normality)	787.8	95% H-Stat UCL	18110

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	927

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (cyclohexane)

General Statistics

Total Number of Observations	61	Number of Distinct Observations	16
Number of Detects	10	Number of Non-Detects	51
Number of Distinct Detects	10	Number of Distinct Non-Detects	7
Minimum Detect	0.34	Minimum Non-Detect	0.5
Maximum Detect	130	Maximum Non-Detect	25
Variance Detects	1715	Percent Non-Detects	83.61%
Mean Detects	41.65	SD Detects	41.42
Median Detects	36	CV Detects	0.994
Skewness Detects	1.049	Kurtosis Detects	0.88
Mean of Logged Detects	2.871	SD of Logged Detects	1.817

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.183	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	7.134	KM Standard Error of Mean	2.978
KM SD	22.07	95% KM (BCA) UCL	12.48
95% KM (t) UCL	12.11	95% KM (Percentile Bootstrap) UCL	11.9
95% KM (z) UCL	12.03	95% KM Bootstrap t UCL	14.87
90% KM Chebyshev UCL	16.07	95% KM Chebyshev UCL	20.12
97.5% KM Chebyshev UCL	25.73	99% KM Chebyshev UCL	36.77

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.268	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.192	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.277	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.703	k star (bias corrected MLE)	0.559
Theta hat (MLE)	59.22	Theta star (bias corrected MLE)	74.51
nu hat (MLE)	14.07	nu star (bias corrected)	11.18
Mean (detects)	41.65		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	7.124
Maximum	130	Median	0.01
SD	22.3	CV	3.13
k hat (MLE)	0.152	k star (bias corrected MLE)	0.156
Theta hat (MLE)	46.8	Theta star (bias corrected MLE)	45.77
nu hat (MLE)	18.57	nu star (bias corrected)	18.99
Adjusted Level of Significance (β)	0.0461		
Approximate Chi Square Value (18.99, α)	10.11	Adjusted Chi Square Value (18.99, β)	9.952
95% Gamma Approximate UCL (use when n>=50)	13.38	95% Gamma Adjusted UCL (use when n<50)	13.59

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	7.134	SD (KM)	22.07
Variance (KM)	486.9	SE of Mean (KM)	2.978
k hat (KM)	0.105	k star (KM)	0.11
nu hat (KM)	12.75	nu star (KM)	13.46
theta hat (KM)	68.25	theta star (KM)	64.67
80% gamma percentile (KM)	5.656	90% gamma percentile (KM)	19.7
95% gamma percentile (KM)	41.09	99% gamma percentile (KM)	107.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.46, α)	6.202	Adjusted Chi Square Value (13.46, β)	6.082
95% Gamma Approximate KM-UCL (use when n>=50)	15.48	95% Gamma Adjusted KM-UCL (use when n<50)	15.78

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	7.502	Mean in Log Scale	-0.769
SD in Original Scale	22.16	SD in Log Scale	2.477

95% t UCL (assumes normality of ROS data)	12.24	95% Percentile Bootstrap UCL	12.14
95% BCA Bootstrap UCL	14.29	95% Bootstrap t UCL	15.49
95% H-UCL (Log ROS)	30.07		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.421	KM Geo Mean	0.657
KM SD (logged)	1.625	95% Critical H Value (KM-Log)	2.68
KM Standard Error of Mean (logged)	0.221	95% H-UCL (KM -Log)	4.316
KM SD (logged)	1.625	95% Critical H Value (KM-Log)	2.68
KM Standard Error of Mean (logged)	0.221		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	7.665	Mean in Log Scale	-0.326
SD in Original Scale	22.2	SD in Log Scale	1.841
95% t UCL (Assumes normality)	12.41	95% H-Stat UCL	7.899

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 12.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (delta bhc)

General Statistics

Total Number of Observations	46	Number of Distinct Observations	10
Number of Detects	5	Number of Non-Detects	41
Number of Distinct Detects	4	Number of Distinct Non-Detects	6
Minimum Detect	0.0061	Minimum Non-Detect	0.0026
Maximum Detect	0.057	Maximum Non-Detect	0.029
Variance Detects	4.4252E-4	Percent Non-Detects	89.13%
Mean Detects	0.0197	SD Detects	0.021
Median Detects	0.013	CV Detects	1.067
Skewness Detects	2.131	Kurtosis Detects	4.645
Mean of Logged Detects	-4.261	SD of Logged Detects	0.84

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.679	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.425	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00989	KM Standard Error of Mean	0.00229
KM SD	0.00808	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0137	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0137	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0168	95% KM Chebyshev UCL	0.0199
97.5% KM Chebyshev UCL	0.0242	99% KM Chebyshev UCL	0.0327

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.649	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.686	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.39	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.361	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.639	k star (bias corrected MLE)	0.789
Theta hat (MLE)	0.012	Theta star (bias corrected MLE)	0.025
nu hat (MLE)	16.39	nu star (bias corrected)	7.889
Mean (detects)	0.0197		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0061	Mean	0.0138
Maximum	0.057	Median	0.01
SD	0.00849	CV	0.614
k hat (MLE)	4.953	k star (bias corrected MLE)	4.644
Theta hat (MLE)	0.00279	Theta star (bias corrected MLE)	0.00298
nu hat (MLE)	455.7	nu star (bias corrected)	427.3
Adjusted Level of Significance (β)	0.0448		
Approximate Chi Square Value (427.28, α)	380.4	Adjusted Chi Square Value (427.28, β)	378.9
95% Gamma Approximate UCL (use when n>=50)	0.0155	95% Gamma Adjusted UCL (use when n<50)	0.0156

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00989	SD (KM)	0.00808
Variance (KM)	6.5269E-5	SE of Mean (KM)	0.00229
k hat (KM)	1.498	k star (KM)	1.414
nu hat (KM)	137.8	nu star (KM)	130.1
theta hat (KM)	0.0066	theta star (KM)	0.00699
80% gamma percentile (KM)	0.0154	90% gamma percentile (KM)	0.0209
95% gamma percentile (KM)	0.0263	99% gamma percentile (KM)	0.0384

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (130.13, α)	104.8	Adjusted Chi Square Value (130.13, β)	104
95% Gamma Approximate KM-UCL (use when n>=50)	0.0123	95% Gamma Adjusted KM-UCL (use when n<50)	0.0124

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.339	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0106	Mean in Log Scale	-4.776
SD in Original Scale	0.009	SD in Log Scale	0.667

95% t UCL (assumes normality of ROS data)	0.0129	95% Percentile Bootstrap UCL	0.013
95% BCA Bootstrap UCL	0.0138	95% Bootstrap t UCL	0.0142
95% H-UCL (Log ROS)	0.0129		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.835	KM Geo Mean	0.00795
KM SD (logged)	0.666	95% Critical H Value (KM-Log)	2.006
KM Standard Error of Mean (logged)	0.299	95% H-UCL (KM -Log)	0.0121
KM SD (logged)	0.666	95% Critical H Value (KM-Log)	2.006
KM Standard Error of Mean (logged)	0.299		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0136	Mean in Log Scale	-4.378
SD in Original Scale	0.00689	SD in Log Scale	0.427
95% t UCL (Assumes normality)	0.0153	95% H-Stat UCL	0.0154

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

ıma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.0124

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (ethylbenzene)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	24
Number of Detects	17	Number of Non-Detects	78
Number of Distinct Detects	17	Number of Distinct Non-Detects	8
Minimum Detect	0.18	Minimum Non-Detect	0.5
Maximum Detect	56	Maximum Non-Detect	25
Variance Detects	260.7	Percent Non-Detects	82.11%
Mean Detects	14.08	SD Detects	16.15
Median Detects	5.6	CV Detects	1.147
Skewness Detects	1.218	Kurtosis Detects	1.099
Mean of Logged Detects	1.634	SD of Logged Detects	1.75

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.816	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.207	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.818	KM Standard Error of Mean	0.902
KM SD	8.48	95% KM (BCA) UCL	4.445
95% KM (t) UCL	4.316	95% KM (Percentile Bootstrap) UCL	4.377
95% KM (z) UCL	4.301	95% KM Bootstrap t UCL	4.806
90% KM Chebyshev UCL	5.523	95% KM Chebyshev UCL	6.749
97.5% KM Chebyshev UCL	8.449	99% KM Chebyshev UCL	11.79

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.5	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.788	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.171	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.219	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.61	k star (bias corrected MLE)	0.542
Theta hat (MLE)	23.09	Theta star (bias corrected MLE)	26.01
nu hat (MLE)	20.74	nu star (bias corrected)	18.41
Mean (detects)	14.08		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.578
Maximum	56	Median	0.01
SD	8.581	CV	3.328
k hat (MLE)	0.176	k star (bias corrected MLE)	0.177
Theta hat (MLE)	14.66	Theta star (bias corrected MLE)	14.54
nu hat (MLE)	33.41	nu star (bias corrected)	33.69
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (33.69, α)	21.41	Adjusted Chi Square Value (33.69, β)	21.26
95% Gamma Approximate UCL (use when n>=50)	4.056	95% Gamma Adjusted UCL (use when n<50)	4.084

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.818	SD (KM)	8.48
Variance (KM)	71.91	SE of Mean (KM)	0.902
k hat (KM)	0.11	k star (KM)	0.114
nu hat (KM)	20.98	nu star (KM)	21.65
theta hat (KM)	25.52	theta star (KM)	24.73
80% gamma percentile (KM)	2.326	90% gamma percentile (KM)	7.863
95% gamma percentile (KM)	16.18	99% gamma percentile (KM)	41.89

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (21.65, α)	12.08	Adjusted Chi Square Value (21.65, β)	11.97
95% Gamma Approximate KM-UCL (use when n>=50)	5.052	95% Gamma Adjusted KM-UCL (use when n<50)	5.098

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.892	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.207	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.834	Mean in Log Scale	-1.256
SD in Original Scale	8.511	SD in Log Scale	2.103

95% t UCL (assumes normality of ROS data)	4.284	95% Percentile Bootstrap UCL	4.385
95% BCA Bootstrap UCL	4.821	95% Bootstrap t UCL	5.036
95% H-UCL (Log ROS)	5.603		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.724	KM Geo Mean	0.485
KM SD (logged)	1.399	95% Critical H Value (KM-Log)	2.673
KM Standard Error of Mean (logged)	0.291	95% H-UCL (KM -Log)	1.897
KM SD (logged)	1.399	95% Critical H Value (KM-Log)	2.673
KM Standard Error of Mean (logged)	0.291		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	3.696	Mean in Log Scale	-0.234
SD in Original Scale	8.667	SD in Log Scale	1.536
95% t UCL (Assumes normality)	5.174	95% H-Stat UCL	4.035

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	5.052

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (gamma-chlordane)

General Statistics

Total Number of Observations	46	Number of Distinct Observations	14
Number of Detects	9	Number of Non-Detects	37
Number of Distinct Detects	9	Number of Distinct Non-Detects	5
Minimum Detect	0.0018	Minimum Non-Detect	0.025
Maximum Detect	3.9	Maximum Non-Detect	0.029
Variance Detects	1.843	Percent Non-Detects	80.43%
Mean Detects	0.874	SD Detects	1.358
Median Detects	0.0034	CV Detects	1.554
Skewness Detects	1.718	Kurtosis Detects	2.516
Mean of Logged Detects	-3.109	SD of Logged Detects	3.427

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.728	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.295	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.173	KM Standard Error of Mean	0.104
KM SD	0.663	95% KM (BCA) UCL	0.363
95% KM (t) UCL	0.347	95% KM (Percentile Bootstrap) UCL	0.352
95% KM (z) UCL	0.344	95% KM Bootstrap t UCL	0.768
90% KM Chebyshev UCL	0.484	95% KM Chebyshev UCL	0.625
97.5% KM Chebyshev UCL	0.821	99% KM Chebyshev UCL	1.205

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.96	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.831	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.35	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.306	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.24	k star (bias corrected MLE)	0.234
Theta hat (MLE)	3.635	Theta star (bias corrected MLE)	3.729
nu hat (MLE)	4.326	nu star (bias corrected)	4.217
Mean (detects)	0.874		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0018	Mean	0.227
Maximum	3.9	Median	0.01
SD	0.67	CV	2.952
k hat (MLE)	0.302	k star (bias corrected MLE)	0.297
Theta hat (MLE)	0.752	Theta star (bias corrected MLE)	0.765
nu hat (MLE)	27.78	nu star (bias corrected)	27.3
Adjusted Level of Significance (β)	0.0448		
Approximate Chi Square Value (27.30, α)	16.39	Adjusted Chi Square Value (27.30, β)	16.11
95% Gamma Approximate UCL (use when n>=50)	0.378	95% Gamma Adjusted UCL (use when n<50)	0.385

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.173	SD (KM)	0.663
Variance (KM)	0.44	SE of Mean (KM)	0.104
k hat (KM)	0.0681	k star (KM)	0.0781
nu hat (KM)	6.263	nu star (KM)	7.187
theta hat (KM)	2.542	theta star (KM)	2.215
80% gamma percentile (KM)	0.0786	90% gamma percentile (KM)	0.404
95% gamma percentile (KM)	1.005	99% gamma percentile (KM)	3.099

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.19, α)	2.274	Adjusted Chi Square Value (7.19, β)	2.186
95% Gamma Approximate KM-UCL (use when n>=50)	0.547	95% Gamma Adjusted KM-UCL (use when n<50)	0.569

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.76	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.329	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.185	Mean in Log Scale	-5.05

SD in Original Scale	0.668	SD in Log Scale	2.488
95% t UCL (assumes normality of ROS data)	0.35	95% Percentile Bootstrap UCL	0.357
95% BCA Bootstrap UCL	0.457	95% Bootstrap t UCL	0.802
95% H-UCL (Log ROS)	0.69		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.409	KM Geo Mean	0.00447
KM SD (logged)	1.836	95% Critical H Value (KM-Log)	3.356
KM Standard Error of Mean (logged)	0.301	95% H-UCL (KM -Log)	0.0604
KM SD (logged)	1.836	95% Critical H Value (KM-Log)	3.356
KM Standard Error of Mean (logged)	0.301		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.181	Mean in Log Scale	-4.098
SD in Original Scale	0.668	SD in Log Scale	1.527
95% t UCL (Assumes normality)	0.347	95% H-Stat UCL	0.104

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM Chebyshev UCL 0.625

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (heptachlor epoxide)

General Statistics

Total Number of Observations	46	Number of Distinct Observations	11
Number of Detects	8	Number of Non-Detects	38
Number of Distinct Detects	8	Number of Distinct Non-Detects	4
Minimum Detect	0.0023	Minimum Non-Detect	0.025
Maximum Detect	2.5	Maximum Non-Detect	0.028
Variance Detects	0.759	Percent Non-Detects	82.61%
Mean Detects	0.348	SD Detects	0.871
Median Detects	0.025	CV Detects	2.504
Skewness Detects	2.807	Kurtosis Detects	7.905
Mean of Logged Detects	-3.397	SD of Logged Detects	2.192

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.463	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.456	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0698	KM Standard Error of Mean	0.0574
KM SD	0.363	95% KM (BCA) UCL	0.181
95% KM (t) UCL	0.166	95% KM (Percentile Bootstrap) UCL	0.178
95% KM (z) UCL	0.164	95% KM Bootstrap t UCL	1.138
90% KM Chebyshev UCL	0.242	95% KM Chebyshev UCL	0.32
97.5% KM Chebyshev UCL	0.428	99% KM Chebyshev UCL	0.641

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.972	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.799	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.335	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.317	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.295	k star (bias corrected MLE)	0.268
Theta hat (MLE)	1.178	Theta star (bias corrected MLE)	1.299
nu hat (MLE)	4.725	nu star (bias corrected)	4.286
Mean (detects)	0.348		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0023	Mean	0.0803
Maximum	2.5	Median	0.01
SD	0.368	CV	4.581
k hat (MLE)	0.398	k star (bias corrected MLE)	0.387
Theta hat (MLE)	0.202	Theta star (bias corrected MLE)	0.208
nu hat (MLE)	36.65	nu star (bias corrected)	35.59
Adjusted Level of Significance (β)	0.0448		
Approximate Chi Square Value (35.59, α)	22.94	Adjusted Chi Square Value (35.59, β)	22.61
95% Gamma Approximate UCL (use when n>=50)	0.125	95% Gamma Adjusted UCL (use when n<50)	0.126

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0698	SD (KM)	0.363
Variance (KM)	0.132	SE of Mean (KM)	0.0574
k hat (KM)	0.037	k star (KM)	0.0491
nu hat (KM)	3.404	nu star (KM)	4.515
theta hat (KM)	1.888	theta star (KM)	1.423
80% gamma percentile (KM)	0.00887	90% gamma percentile (KM)	0.104
95% gamma percentile (KM)	0.369	99% gamma percentile (KM)	1.531

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.52, α)	0.935	Adjusted Chi Square Value (4.52, β)	0.885
95% Gamma Approximate KM-UCL (use when n>=50)	0.337	95% Gamma Adjusted KM-UCL (use when n<50)	0.356

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0706	Mean in Log Scale	-4.761

SD in Original Scale	0.367	SD in Log Scale	1.558
95% t UCL (assumes normality of ROS data)	0.161	95% Percentile Bootstrap UCL	0.179
95% BCA Bootstrap UCL	0.235	95% Bootstrap t UCL	1.682
95% H-UCL (Log ROS)	0.0577		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.612	KM Geo Mean	0.00993
KM SD (logged)	1.326	95% Critical H Value (KM-Log)	2.698
KM Standard Error of Mean (logged)	0.476	95% H-UCL (KM -Log)	0.0408
KM SD (logged)	1.326	95% Critical H Value (KM-Log)	2.698
KM Standard Error of Mean (logged)	0.476		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0712	Mean in Log Scale	-4.181
SD in Original Scale	0.367	SD in Log Scale	0.939
95% t UCL (Assumes normality)	0.162	95% H-Stat UCL	0.0326

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Chebyshev UCL 0.32

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (hexachlorocyclohexane, beta-)

General Statistics

Total Number of Observations	46	Number of Distinct Observations	18
Number of Detects	14	Number of Non-Detects	32
Number of Distinct Detects	14	Number of Distinct Non-Detects	4
Minimum Detect	0.0046	Minimum Non-Detect	0.025
Maximum Detect	0.82	Maximum Non-Detect	0.028
Variance Detects	0.0702	Percent Non-Detects	69.57%
Mean Detects	0.214	SD Detects	0.265
Median Detects	0.0765	CV Detects	1.237
Skewness Detects	1.152	Kurtosis Detects	0.244
Mean of Logged Detects	-2.614	SD of Logged Detects	1.729

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.776	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.338	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0753	KM Standard Error of Mean	0.0259
KM SD	0.168	95% KM (BCA) UCL	0.12
95% KM (t) UCL	0.119	95% KM (Percentile Bootstrap) UCL	0.119
95% KM (z) UCL	0.118	95% KM Bootstrap t UCL	0.141
90% KM Chebyshev UCL	0.153	95% KM Chebyshev UCL	0.188
97.5% KM Chebyshev UCL	0.237	99% KM Chebyshev UCL	0.333

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.634	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.786	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.218	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.24	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.579	k star (bias corrected MLE)	0.502
Theta hat (MLE)	0.37	Theta star (bias corrected MLE)	0.426
nu hat (MLE)	16.21	nu star (bias corrected)	14.07
Mean (detects)	0.214		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0046	Mean	0.0794
Maximum	0.82	Median	0.01
SD	0.17	CV	2.138
k hat (MLE)	0.521	k star (bias corrected MLE)	0.501
Theta hat (MLE)	0.152	Theta star (bias corrected MLE)	0.158
nu hat (MLE)	47.89	nu star (bias corrected)	46.1
Adjusted Level of Significance (β)	0.0448		
Approximate Chi Square Value (46.10, α)	31.52	Adjusted Chi Square Value (46.10, β)	31.13
95% Gamma Approximate UCL (use when n>=50)	0.116	95% Gamma Adjusted UCL (use when n<50)	0.118

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0753	SD (KM)	0.168
Variance (KM)	0.0283	SE of Mean (KM)	0.0259
k hat (KM)	0.2	k star (KM)	0.201
nu hat (KM)	18.4	nu star (KM)	18.53
theta hat (KM)	0.376	theta star (KM)	0.374
80% gamma percentile (KM)	0.0995	90% gamma percentile (KM)	0.228
95% gamma percentile (KM)	0.387	99% gamma percentile (KM)	0.825

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (18.53, α)	9.777	Adjusted Chi Square Value (18.53, β)	9.571
95% Gamma Approximate KM-UCL (use when n>=50)	0.143	95% Gamma Adjusted KM-UCL (use when n<50)	0.146

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.179	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0776	Mean in Log Scale	-3.928
SD in Original Scale	0.17	SD in Log Scale	1.565

95% t UCL (assumes normality of ROS data)	0.12	95% Percentile Bootstrap UCL	0.122
95% BCA Bootstrap UCL	0.129	95% Bootstrap t UCL	0.143
95% H-UCL (Log ROS)	0.135		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.883	KM Geo Mean	0.0206
KM SD (logged)	1.37	95% Critical H Value (KM-Log)	2.751
KM Standard Error of Mean (logged)	0.317	95% H-UCL (KM -Log)	0.0923
KM SD (logged)	1.37	95% Critical H Value (KM-Log)	2.751
KM Standard Error of Mean (logged)	0.317		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0743	Mean in Log Scale	-3.812
SD in Original Scale	0.17	SD in Log Scale	1.228
95% t UCL (Assumes normality)	0.116	95% H-Stat UCL	0.0753

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

ıma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.146

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (irondissolved)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	350	Mean	9861
Maximum	34000	Median	5500
SD	10889	Std. Error of Mean	3630
Coefficient of Variation	1.104	Skewness	1.494

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.211	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	16611	95% Adjusted-CLT UCL (Chen-1995)	17763
		95% Modified-t UCL (Johnson-1978)	16912

Gamma GOF Test

A-D Test Statistic	0.239	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.749	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.175	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.289	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.816	k star (bias corrected MLE)	0.618
Theta hat (MLE)	12086	Theta star (bias corrected MLE)	15957
nu hat (MLE)	14.69	nu star (bias corrected)	11.12
MLE Mean (bias corrected)	9861	MLE Sd (bias corrected)	12544
		Approximate Chi Square Value (0.05)	4.656
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	3.813

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	23561	95% Adjusted Gamma UCL (use when n<50)	28769

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.18	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.858	Mean of logged Data	8.471
Maximum of Logged Data	10.43	SD of logged Data	1.462

Assuming Lognormal Distribution

95% H-UCL	131617	90% Chebyshev (MVUE) UCL	28780
95% Chebyshev (MVUE) UCL	36627	97.5% Chebyshev (MVUE) UCL	47519
99% Chebyshev (MVUE) UCL	68914		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	15831	95% Jackknife UCL	16611
95% Standard Bootstrap UCL	15469	95% Bootstrap-t UCL	20280
95% Hall's Bootstrap UCL	20222	95% Percentile Bootstrap UCL	16050
95% BCA Bootstrap UCL	17178		
90% Chebyshev(Mean, Sd) UCL	20750	95% Chebyshev(Mean, Sd) UCL	25682
97.5% Chebyshev(Mean, Sd) UCL	32528	99% Chebyshev(Mean, Sd) UCL	45976

Suggested UCL to Use

95% Student's-t UCL 16611

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (irontotal)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	1800	Mean	11889
Maximum	36000	Median	7500
SD	11131	Std. Error of Mean	3710
Coefficient of Variation	0.936	Skewness	1.351

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	18788	95% Adjusted-CLT UCL (Chen-1995)	19777
		95% Modified-t UCL (Johnson-1978)	19067

Gamma GOF Test

A-D Test Statistic	0.396	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.206	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.285	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.324	k star (bias corrected MLE)	0.957
Theta hat (MLE)	8982	Theta star (bias corrected MLE)	12429
nu hat (MLE)	23.83	nu star (bias corrected)	17.22
MLE Mean (bias corrected)	11889	MLE Sd (bias corrected)	12156
		Approximate Chi Square Value (0.05)	8.828
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	7.595

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	23188	95% Adjusted Gamma UCL (use when n<50)	26952

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	7.496	Mean of logged Data	8.96
Maximum of Logged Data	10.49	SD of logged Data	1.015

Assuming Lognormal Distribution

95% H-UCL	42146	90% Chebyshev (MVUE) UCL	24771
95% Chebyshev (MVUE) UCL	30522	97.5% Chebyshev (MVUE) UCL	38504
99% Chebyshev (MVUE) UCL	54183		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	17992	95% Jackknife UCL	18788
95% Standard Bootstrap UCL	17578	95% Bootstrap-t UCL	21515
95% Hall's Bootstrap UCL	21047	95% Percentile Bootstrap UCL	17600
95% BCA Bootstrap UCL	18911		
90% Chebyshev(Mean, Sd) UCL	23020	95% Chebyshev(Mean, Sd) UCL	28062
97.5% Chebyshev(Mean, Sd) UCL	35060	99% Chebyshev(Mean, Sd) UCL	48806

Suggested UCL to Use

95% Student's-t UCL	18788

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (leadtotal)

General Statistics

Total Number of Observations	52	Number of Distinct Observations	20
Number of Detects	11	Number of Non-Detects	41
Number of Distinct Detects	11	Number of Distinct Non-Detects	11
Minimum Detect	2.8	Minimum Non-Detect	1.9
Maximum Detect	23	Maximum Non-Detect	11
Variance Detects	31.23	Percent Non-Detects	78.85%
Mean Detects	7.982	SD Detects	5.589
Median Detects	5.9	CV Detects	0.7
Skewness Detects	2.251	Kurtosis Detects	5.64
Mean of Logged Detects	1.918	SD of Logged Detects	0.556

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.732	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.297	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.099	KM Standard Error of Mean	0.611
KM SD	3.511	95% KM (BCA) UCL	5.647
95% KM (t) UCL	5.123	95% KM (Percentile Bootstrap) UCL	5.306
95% KM (z) UCL	5.104	95% KM Bootstrap t UCL	5.262
90% KM Chebyshev UCL	5.932	95% KM Chebyshev UCL	6.763
97.5% KM Chebyshev UCL	7.915	99% KM Chebyshev UCL	10.18

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.701	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.246	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.257	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.293	k star (bias corrected MLE)	2.456
Theta hat (MLE)	2.424	Theta star (bias corrected MLE)	3.25
nu hat (MLE)	72.45	nu star (bias corrected)	54.03
Mean (detects)	7.982		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.063
Maximum	23	Median	1.162
SD	4.297	CV	1.403
k hat (MLE)	0.297	k star (bias corrected MLE)	0.293
Theta hat (MLE)	10.3	Theta star (bias corrected MLE)	10.45
nu hat (MLE)	30.92	nu star (bias corrected)	30.47
Adjusted Level of Significance (β)	0.0454		
Approximate Chi Square Value (30.47, α)	18.86	Adjusted Chi Square Value (30.47, β)	18.6
95% Gamma Approximate UCL (use when n>=50)	4.947	95% Gamma Adjusted UCL (use when n<50)	5.017

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.099	SD (KM)	3.511
Variance (KM)	12.33	SE of Mean (KM)	0.611
k hat (KM)	1.363	k star (KM)	1.297
nu hat (KM)	141.8	nu star (KM)	134.9
theta hat (KM)	3.007	theta star (KM)	3.16
80% gamma percentile (KM)	6.441	90% gamma percentile (KM)	8.852
95% gamma percentile (KM)	11.22	99% gamma percentile (KM)	16.61

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (134.91, α)	109.1	Adjusted Chi Square Value (134.91, β)	108.4
95% Gamma Approximate KM-UCL (use when n>=50)	5.07	95% Gamma Adjusted KM-UCL (use when n<50)	5.101

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.057	Mean in Log Scale	1.144
SD in Original Scale	3.614	SD in Log Scale	0.692

95% t UCL (assumes normality of ROS data)	4.896	95% Percentile Bootstrap UCL	4.975
95% BCA Bootstrap UCL	5.226	95% Bootstrap t UCL	5.327
95% H-UCL (Log ROS)	4.855		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.186	KM Geo Mean	3.275
KM SD (logged)	0.619	95% Critical H Value (KM-Log)	1.962
KM Standard Error of Mean (logged)	0.132	95% H-UCL (KM -Log)	4.703
KM SD (logged)	0.619	95% Critical H Value (KM-Log)	1.962
KM Standard Error of Mean (logged)	0.132		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.936	Mean in Log Scale	1.438
SD in Original Scale	3.235	SD in Log Scale	0.581
95% t UCL (Assumes normality)	5.687	95% H-Stat UCL	5.837

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	5.07

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (lindane)

General Statistics

Total Number of Observations	46	Number of Distinct Observations	12
Number of Detects	8	Number of Non-Detects	38
Number of Distinct Detects	8	Number of Distinct Non-Detects	6
Minimum Detect	0.0039	Minimum Non-Detect	0.0063
Maximum Detect	0.17	Maximum Non-Detect	0.028
Variance Detects	0.0031	Percent Non-Detects	82.61%
Mean Detects	0.0339	SD Detects	0.0557
Median Detects	0.0165	CV Detects	1.642
Skewness Detects	2.697	Kurtosis Detects	7.443
Mean of Logged Detects	-4.131	SD of Logged Detects	1.202

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.563	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.431	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.013	KM Standard Error of Mean	0.00431
KM SD	0.0244	95% KM (BCA) UCL	0.0217
95% KM (t) UCL	0.0203	95% KM (Percentile Bootstrap) UCL	0.0204
95% KM (z) UCL	0.0201	95% KM Bootstrap t UCL	0.0273
90% KM Chebyshev UCL	0.0259	95% KM Chebyshev UCL	0.0318
97.5% KM Chebyshev UCL	0.0399	99% KM Chebyshev UCL	0.0559

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.695	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.312	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.304	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.795	k star (bias corrected MLE)	0.58
Theta hat (MLE)	0.0426	Theta star (bias corrected MLE)	0.0584
nu hat (MLE)	12.73	nu star (bias corrected)	9.287
Mean (detects)	0.0339		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0039	Mean	0.0169
Maximum	0.17	Median	0.01
SD	0.0243	CV	1.436
k hat (MLE)	1.9	k star (bias corrected MLE)	1.791
Theta hat (MLE)	0.00891	Theta star (bias corrected MLE)	0.00945
nu hat (MLE)	174.8	nu star (bias corrected)	164.8
Adjusted Level of Significance (β)	0.0448		
Approximate Chi Square Value (164.76, α)	136.1	Adjusted Chi Square Value (164.76, β)	135.2
95% Gamma Approximate UCL (use when n>=50)	0.0205	95% Gamma Adjusted UCL (use when n<50)	0.0206

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.013	SD (KM)	0.0244
Variance (KM)	5.9454E-4	SE of Mean (KM)	0.00431
k hat (KM)	0.285	k star (KM)	0.281
nu hat (KM)	26.24	nu star (KM)	25.86
theta hat (KM)	0.0457	theta star (KM)	0.0463
80% gamma percentile (KM)	0.0196	90% gamma percentile (KM)	0.0387
95% gamma percentile (KM)	0.0608	99% gamma percentile (KM)	0.119

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.86, α)	15.27	Adjusted Chi Square Value (25.86, β)	15.01
95% Gamma Approximate KM-UCL (use when n>=50)	0.022	95% Gamma Adjusted KM-UCL (use when n<50)	0.0224

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.219	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0129	Mean in Log Scale	-4.879
SD in Original Scale	0.0247	SD in Log Scale	0.898

95% t UCL (assumes normality of ROS data)	0.019	95% Percentile Bootstrap UCL	0.0195
95% BCA Bootstrap UCL	0.0234	95% Bootstrap t UCL	0.0309
95% H-UCL (Log ROS)	0.0153		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.831	KM Geo Mean	0.00798
KM SD (logged)	0.818	95% Critical H Value (KM-Log)	2.144
KM Standard Error of Mean (logged)	0.248	95% H-UCL (KM -Log)	0.0145
KM SD (logged)	0.818	95% Critical H Value (KM-Log)	2.144
KM Standard Error of Mean (logged)	0.248		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0163	Mean in Log Scale	-4.358
SD in Original Scale	0.0235	SD in Log Scale	0.555
95% t UCL (Assumes normality)	0.0221	95% H-Stat UCL	0.0175

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

ıma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.0224

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (manganesedissolved)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	53	Mean	338.6
Maximum	1800	Median	130
SD	559.9	Std. Error of Mean	186.6
Coefficient of Variation	1.654	Skewness	2.78

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.545	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.389	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	685.6	95% Adjusted-CLT UCL (Chen-1995)	830.3
		95% Modified-t UCL (Johnson-1978)	714.4

Gamma GOF Test

A-D Test Statistic	1.045	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.339	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.288	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.862	k star (bias corrected MLE)	0.649
Theta hat (MLE)	392.7	Theta star (bias corrected MLE)	521.8
nu hat (MLE)	15.52	nu star (bias corrected)	11.68
MLE Mean (bias corrected)	338.6	MLE Sd (bias corrected)	420.3
		Approximate Chi Square Value (0.05)	5.016
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	4.134

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	788.3	95% Adjusted Gamma UCL (use when n<50)	956.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.259	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.97	Mean of logged Data	5.143
Maximum of Logged Data	7.496	SD of logged Data	1.067

Assuming Lognormal Distribution

95% H-UCL	1086	90% Chebyshev (MVUE) UCL	584.6
95% Chebyshev (MVUE) UCL	723.7	97.5% Chebyshev (MVUE) UCL	916.7
99% Chebyshev (MVUE) UCL	1296		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	645.5	95% Jackknife UCL	685.6
95% Standard Bootstrap UCL	623.4	95% Bootstrap-t UCL	3383
95% Hall's Bootstrap UCL	2434	95% Percentile Bootstrap UCL	677.8
95% BCA Bootstrap UCL	847		
90% Chebyshev(Mean, Sd) UCL	898.4	95% Chebyshev(Mean, Sd) UCL	1152
97.5% Chebyshev(Mean, Sd) UCL	1504	99% Chebyshev(Mean, Sd) UCL	2195

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 1152

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Appendix N
ProUCL Output for Groundwater
HAA-01
Hunter Army Airfield
Savannah, Georgia

Result (manganesetotal)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	55	Mean	342.2
Maximum	1800	Median	130
SD	560.6	Std. Error of Mean	186.9
Coefficient of Variation	1.638	Skewness	2.746

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.551	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	689.7	95% Adjusted-CLT UCL (Chen-1995)	832.3
		95% Modified-t UCL (Johnson-1978)	718.2

Gamma GOF Test

A-D Test Statistic	1.074	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.311	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.288	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.865	k star (bias corrected MLE)	0.651
Theta hat (MLE)	395.7	Theta star (bias corrected MLE)	526
nu hat (MLE)	15.57	nu star (bias corrected)	11.71
MLE Mean (bias corrected)	342.2	MLE Sd (bias corrected)	424.3
		Approximate Chi Square Value (0.05)	5.038
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	4.154

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	795.6	95% Adjusted Gamma UCL (use when n<50)	964.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.857	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.246	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.007	Mean of logged Data	5.156
Maximum of Logged Data	7.496	SD of logged Data	1.066

Assuming Lognormal Distribution

95% H-UCL	1097	90% Chebyshev (MVUE) UCL	591.4
95% Chebyshev (MVUE) UCL	732	97.5% Chebyshev (MVUE) UCL	927.2
99% Chebyshev (MVUE) UCL	1311		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	649.6	95% Jackknife UCL	689.7
95% Standard Bootstrap UCL	629.7	95% Bootstrap-t UCL	3335
95% Hall's Bootstrap UCL	2098	95% Percentile Bootstrap UCL	698.3
95% BCA Bootstrap UCL	862.2		
90% Chebyshev(Mean, Sd) UCL	902.8	95% Chebyshev(Mean, Sd) UCL	1157
97.5% Chebyshev(Mean, Sd) UCL	1509	99% Chebyshev(Mean, Sd) UCL	2201

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 1157

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (mercurytotal)

General Statistics

Total Number of Observations	52	Number of Distinct Observations	9
Number of Detects	12	Number of Non-Detects	40
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.016	Minimum Non-Detect	0.1
Maximum Detect	0.1	Maximum Non-Detect	0.1
Variance Detects	0.00125	Percent Non-Detects	76.92%
Mean Detects	0.0524	SD Detects	0.0353
Median Detects	0.047	CV Detects	0.673
Skewness Detects	0.366	Kurtosis Detects	-1.688
Mean of Logged Detects	-3.198	SD of Logged Detects	0.77

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.837	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0402	KM Standard Error of Mean	0.00776
KM SD	0.0266	95% KM (BCA) UCL	0.0529
95% KM (t) UCL	0.0532	95% KM (Percentile Bootstrap) UCL	0.0529
95% KM (z) UCL	0.053	95% KM Bootstrap t UCL	0.0596
90% KM Chebyshev UCL	0.0635	95% KM Chebyshev UCL	0.074
97.5% KM Chebyshev UCL	0.0887	99% KM Chebyshev UCL	0.117

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.7	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.195	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.248	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.157	k star (bias corrected MLE)	1.673
Theta hat (MLE)	0.0243	Theta star (bias corrected MLE)	0.0313
nu hat (MLE)	51.77	nu star (bias corrected)	40.16
Mean (detects)	0.0524		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.04
Maximum	0.1	Median	0.0346
SD	0.024	CV	0.601
k hat (MLE)	2.973	k star (bias corrected MLE)	2.814
Theta hat (MLE)	0.0134	Theta star (bias corrected MLE)	0.0142
nu hat (MLE)	309.2	nu star (bias corrected)	292.7
Adjusted Level of Significance (β)	0.0454		
Approximate Chi Square Value (292.69, α)	254.1	Adjusted Chi Square Value (292.69, β)	253
95% Gamma Approximate UCL (use when n>=50)	0.0461	95% Gamma Adjusted UCL (use when n<50)	0.0462

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0402	SD (KM)	0.0266
Variance (KM)	7.0571E-4	SE of Mean (KM)	0.00776
k hat (KM)	2.292	k star (KM)	2.172
nu hat (KM)	238.3	nu star (KM)	225.9
theta hat (KM)	0.0175	theta star (KM)	0.0185
80% gamma percentile (KM)	0.0596	90% gamma percentile (KM)	0.0767
95% gamma percentile (KM)	0.0929	99% gamma percentile (KM)	0.129

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (225.93, α)	192.1	Adjusted Chi Square Value (225.93, β)	191.2
95% Gamma Approximate KM-UCL (use when n>=50)	0.0473	95% Gamma Adjusted KM-UCL (use when n<50)	0.0475

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.851	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.19	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0378	Mean in Log Scale	-3.461
SD in Original Scale	0.0239	SD in Log Scale	0.618

95% t UCL (assumes normality of ROS data)	0.0433	95% Percentile Bootstrap UCL	0.0433
95% BCA Bootstrap UCL	0.044	95% Bootstrap t UCL	0.0445
95% H-UCL (Log ROS)	0.0451		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.427	KM Geo Mean	0.0325
KM SD (logged)	0.651	95% Critical H Value (KM-Log)	1.987
KM Standard Error of Mean (logged)	0.203	95% H-UCL (KM -Log)	0.0481
KM SD (logged)	0.651	95% Critical H Value (KM-Log)	1.987
KM Standard Error of Mean (logged)	0.203		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0506	Mean in Log Scale	-3.042
SD in Original Scale	0.0164	SD in Log Scale	0.368
95% t UCL (Assumes normality)	0.0544	95% H-Stat UCL	0.0559

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.0532

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (methylcyclohexane)

General Statistics

Total Number of Observations	61	Number of Distinct Observations	15
Number of Detects	8	Number of Non-Detects	53
Number of Distinct Detects	8	Number of Distinct Non-Detects	7
Minimum Detect	1.1	Minimum Non-Detect	5
Maximum Detect	160	Maximum Non-Detect	250
Variance Detects	3329	Percent Non-Detects	86.89%
Mean Detects	47.06	SD Detects	57.69
Median Detects	21	CV Detects	1.226
Skewness Detects	1.219	Kurtosis Detects	0.716
Mean of Logged Detects	2.687	SD of Logged Detects	1.94

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.823	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	8.072	KM Standard Error of Mean	3.545
KM SD	25.28	95% KM (BCA) UCL	15.11
95% KM (t) UCL	13.99	95% KM (Percentile Bootstrap) UCL	14.48
95% KM (z) UCL	13.9	95% KM Bootstrap t UCL	19.25
90% KM Chebyshev UCL	18.71	95% KM Chebyshev UCL	23.52
97.5% KM Chebyshev UCL	30.21	99% KM Chebyshev UCL	43.34

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.365	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.76	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.214	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.308	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.539	k star (bias corrected MLE)	0.42
Theta hat (MLE)	87.31	Theta star (bias corrected MLE)	112
nu hat (MLE)	8.624	nu star (bias corrected)	6.723
Mean (detects)	47.06		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.431
Maximum	160	Median	0.01
SD	25.89	CV	2.745
k hat (MLE)	0.174	k star (bias corrected MLE)	0.176
Theta hat (MLE)	54.32	Theta star (bias corrected MLE)	53.58
nu hat (MLE)	21.18	nu star (bias corrected)	21.47
Adjusted Level of Significance (β)	0.0461		
Approximate Chi Square Value (21.47, α)	11.95	Adjusted Chi Square Value (21.47, β)	11.77
95% Gamma Approximate UCL (use when n>=50)	16.95	95% Gamma Adjusted UCL (use when n<50)	17.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	8.072	SD (KM)	25.28
Variance (KM)	639	SE of Mean (KM)	3.545
k hat (KM)	0.102	k star (KM)	0.108
nu hat (KM)	12.44	nu star (KM)	13.16
theta hat (KM)	79.15	theta star (KM)	74.82
80% gamma percentile (KM)	6.22	90% gamma percentile (KM)	22.12
95% gamma percentile (KM)	46.59	99% gamma percentile (KM)	123.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.16, α)	6.003	Adjusted Chi Square Value (13.16, β)	5.885
95% Gamma Approximate KM-UCL (use when n>=50)	17.7	95% Gamma Adjusted KM-UCL (use when n<50)	18.05

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	9.249	Mean in Log Scale	0.863
SD in Original Scale	24.96	SD in Log Scale	1.546

95% t UCL (assumes normality of ROS data)	14.59	95% Percentile Bootstrap UCL	14.67
95% BCA Bootstrap UCL	17.67	95% Bootstrap t UCL	20.86
95% H-UCL (Log ROS)	13.13		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.854	KM Geo Mean	2.348
KM SD (logged)	1.047	95% Critical H Value (KM-Log)	2.274
KM Standard Error of Mean (logged)	0.234	95% H-UCL (KM -Log)	5.523
KM SD (logged)	1.047	95% Critical H Value (KM-Log)	2.274
KM Standard Error of Mean (logged)	0.234		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	14.61	Mean in Log Scale	1.511
SD in Original Scale	32.71	SD in Log Scale	1.23
95% t UCL (Assumes normality)	21.61	95% H-Stat UCL	13.87

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 13.99

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (naphthalene)

General Statistics

Total Number of Observations	35	Number of Distinct Observations	21
Number of Detects	12	Number of Non-Detects	23
Number of Distinct Detects	12	Number of Distinct Non-Detects	9
Minimum Detect	3.2	Minimum Non-Detect	1
Maximum Detect	120	Maximum Non-Detect	10
Variance Detects	1719	Percent Non-Detects	65.71%
Mean Detects	51.69	SD Detects	41.46
Median Detects	48.5	CV Detects	0.802
Skewness Detects	0.305	Kurtosis Detects	-1.452
Mean of Logged Detects	3.425	SD of Logged Detects	1.266

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.18	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	18.71	KM Standard Error of Mean	5.884
KM SD	33.3	95% KM (BCA) UCL	28.83
95% KM (t) UCL	28.66	95% KM (Percentile Bootstrap) UCL	28.66
95% KM (z) UCL	28.39	95% KM Bootstrap t UCL	31.36
90% KM Chebyshev UCL	36.36	95% KM Chebyshev UCL	44.36
97.5% KM Chebyshev UCL	55.46	99% KM Chebyshev UCL	77.26

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.412	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.171	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.252	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.097	k star (bias corrected MLE)	0.879
Theta hat (MLE)	47.11	Theta star (bias corrected MLE)	58.84
nu hat (MLE)	26.34	nu star (bias corrected)	21.09
Mean (detects)	51.69		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	17.86
Maximum	120	Median	0.01
SD	34.23	CV	1.916
k hat (MLE)	0.166	k star (bias corrected MLE)	0.171
Theta hat (MLE)	107.6	Theta star (bias corrected MLE)	104.5
nu hat (MLE)	11.62	nu star (bias corrected)	11.96
Adjusted Level of Significance (β)	0.0425		
Approximate Chi Square Value (11.96, α)	5.202	Adjusted Chi Square Value (11.96, β)	4.991
95% Gamma Approximate UCL (use when n>=50)	41.07	95% Gamma Adjusted UCL (use when n<50)	42.81

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	18.71	SD (KM)	33.3
Variance (KM)	1109	SE of Mean (KM)	5.884
k hat (KM)	0.316	k star (KM)	0.308
nu hat (KM)	22.1	nu star (KM)	21.54
theta hat (KM)	59.25	theta star (KM)	60.8
80% gamma percentile (KM)	28.87	90% gamma percentile (KM)	55.01
95% gamma percentile (KM)	84.89	99% gamma percentile (KM)	162.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (21.54, α)	12	Adjusted Chi Square Value (21.54, β)	11.66
95% Gamma Approximate KM-UCL (use when n>=50)	33.6	95% Gamma Adjusted KM-UCL (use when n<50)	34.58

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.886	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	18.71	Mean in Log Scale	1.143
SD in Original Scale	33.79	SD in Log Scale	2.006

95% t UCL (assumes normality of ROS data)	28.37	95% Percentile Bootstrap UCL	28.35
95% BCA Bootstrap UCL	30.08	95% Bootstrap t UCL	31.46
95% H-UCL (Log ROS)	89.72		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.333	KM Geo Mean	3.791
KM SD (logged)	1.72	95% Critical H Value (KM-Log)	3.457
KM Standard Error of Mean (logged)	0.327	95% H-UCL (KM -Log)	46.1
KM SD (logged)	1.72	95% Critical H Value (KM-Log)	3.457
KM Standard Error of Mean (logged)	0.327		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	19.21	Mean in Log Scale	1.563
SD in Original Scale	33.52	SD in Log Scale	1.667
95% t UCL (Assumes normality)	28.79	95% H-Stat UCL	50.32

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 28.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (toluene)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	22
Number of Detects	17	Number of Non-Detects	78
Number of Distinct Detects	16	Number of Distinct Non-Detects	6
Minimum Detect	0.18	Minimum Non-Detect	0.5
Maximum Detect	240	Maximum Non-Detect	20
Variance Detects	3433	Percent Non-Detects	82.11%
Mean Detects	22.88	SD Detects	58.59
Median Detects	0.75	CV Detects	2.56
Skewness Detects	3.57	Kurtosis Detects	13.55
Mean of Logged Detects	0.599	SD of Logged Detects	2.268

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.443	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.372	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.207	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.361	KM Standard Error of Mean	2.703
KM SD	25.55	95% KM (BCA) UCL	10.34
95% KM (t) UCL	8.851	95% KM (Percentile Bootstrap) UCL	9.338
95% KM (z) UCL	8.807	95% KM Bootstrap t UCL	20
90% KM Chebyshev UCL	12.47	95% KM Chebyshev UCL	16.14
97.5% KM Chebyshev UCL	21.24	99% KM Chebyshev UCL	31.25

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.025	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.852	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.348	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.228	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.276	k star (bias corrected MLE)	0.267
Theta hat (MLE)	82.88	Theta star (bias corrected MLE)	85.84
nu hat (MLE)	9.388	nu star (bias corrected)	9.065
Mean (detects)	22.88		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4.37
Maximum	240	Median	0.01
SD	25.75	CV	5.892
k hat (MLE)	0.156	k star (bias corrected MLE)	0.158
Theta hat (MLE)	28.03	Theta star (bias corrected MLE)	27.66
nu hat (MLE)	29.62	nu star (bias corrected)	30.02
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (30.02, α)	18.51	Adjusted Chi Square Value (30.02, β)	18.37
95% Gamma Approximate UCL (use when n>=50)	7.088	95% Gamma Adjusted UCL (use when n<50)	7.142

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.361	SD (KM)	25.55
Variance (KM)	653	SE of Mean (KM)	2.703
k hat (KM)	0.0291	k star (KM)	0.0352
nu hat (KM)	5.535	nu star (KM)	6.693
theta hat (KM)	149.7	theta star (KM)	123.8
80% gamma percentile (KM)	0.127	90% gamma percentile (KM)	3.698
95% gamma percentile (KM)	19.28	99% gamma percentile (KM)	107.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.69, α)	2.004	Adjusted Chi Square Value (6.69, β)	1.965
95% Gamma Approximate KM-UCL (use when n>=50)	14.57	95% Gamma Adjusted KM-UCL (use when n<50)	14.86

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.84	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.252	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.207	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.474	Mean in Log Scale	-1.128
SD in Original Scale	25.67	SD in Log Scale	1.739

95% t UCL (assumes normality of ROS data)	8.85	95% Percentile Bootstrap UCL	9.501
95% BCA Bootstrap UCL	12.55	95% Bootstrap t UCL	23.9
95% H-UCL (Log ROS)	2.552		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.903	KM Geo Mean	0.405
KM SD (logged)	1.227	95% Critical H Value (KM-Log)	2.483
KM Standard Error of Mean (logged)	0.184	95% H-UCL (KM -Log)	1.178
KM SD (logged)	1.227	95% Critical H Value (KM-Log)	2.483
KM Standard Error of Mean (logged)	0.184		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.908	Mean in Log Scale	-0.536
SD in Original Scale	25.67	SD in Log Scale	1.38
95% t UCL (Assumes normality)	9.283	95% H-Stat UCL	2.213

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	16.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (trans-1,2-dichloroethene)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	32
Number of Detects	30	Number of Non-Detects	65
Number of Distinct Detects	29	Number of Distinct Non-Detects	3
Minimum Detect	0.19	Minimum Non-Detect	0.5
Maximum Detect	240	Maximum Non-Detect	20
Variance Detects	4455	Percent Non-Detects	68.42%
Mean Detects	31.24	SD Detects	66.74
Median Detects	7.25	CV Detects	2.136
Skewness Detects	2.585	Kurtosis Detects	5.485
Mean of Logged Detects	1.76	SD of Logged Detects	1.948

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.489	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.927	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.406	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.159	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	10.06	KM Standard Error of Mean	4.131
KM SD	39.59	95% KM (BCA) UCL	17.8
95% KM (t) UCL	16.92	95% KM (Percentile Bootstrap) UCL	16.91
95% KM (z) UCL	16.85	95% KM Bootstrap t UCL	21.59
90% KM Chebyshev UCL	22.45	95% KM Chebyshev UCL	28.07
97.5% KM Chebyshev UCL	35.86	99% KM Chebyshev UCL	51.16

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.919	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.833	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.252	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.172	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.393	k star (bias corrected MLE)	0.376
Theta hat (MLE)	79.59	Theta star (bias corrected MLE)	83.2
nu hat (MLE)	23.55	nu star (bias corrected)	22.53
Mean (detects)	31.24		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.873
Maximum	240	Median	0.01
SD	39.84	CV	4.035
k hat (MLE)	0.156	k star (bias corrected MLE)	0.158
Theta hat (MLE)	63.13	Theta star (bias corrected MLE)	62.3
nu hat (MLE)	29.71	nu star (bias corrected)	30.11
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (30.11, α)	18.58	Adjusted Chi Square Value (30.11, β)	18.44
95% Gamma Approximate UCL (use when n>=50)	16	95% Gamma Adjusted UCL (use when n<50)	16.12

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.06	SD (KM)	39.59
Variance (KM)	1567	SE of Mean (KM)	4.131
k hat (KM)	0.0646	k star (KM)	0.0695
nu hat (KM)	12.26	nu star (KM)	13.21
theta hat (KM)	155.8	theta star (KM)	144.7
80% gamma percentile (KM)	3.546	90% gamma percentile (KM)	21.59
95% gamma percentile (KM)	57.8	99% gamma percentile (KM)	190.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.21, α)	6.035	Adjusted Chi Square Value (13.21, β)	5.96
95% Gamma Approximate KM-UCL (use when n>=50)	22.02	95% Gamma Adjusted KM-UCL (use when n<50)	22.29

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.927	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.122	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.159	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.15	Mean in Log Scale	-0.688
SD in Original Scale	39.77	SD in Log Scale	2.42

95% t UCL (assumes normality of ROS data)	16.93	95% Percentile Bootstrap UCL	16.98
95% BCA Bootstrap UCL	19.8	95% Bootstrap t UCL	24.25
95% H-UCL (Log ROS)	25.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.396	KM Geo Mean	0.673
KM SD (logged)	1.837	95% Critical H Value (KM-Log)	3.198
KM Standard Error of Mean (logged)	0.207	95% H-UCL (KM -Log)	6.661
KM SD (logged)	1.837	95% Critical H Value (KM-Log)	3.198
KM Standard Error of Mean (logged)	0.207		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.21	Mean in Log Scale	-0.171
SD in Original Scale	39.77	SD in Log Scale	1.764
95% t UCL (Assumes normality)	16.98	95% H-Stat UCL	7.028

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	6.661

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (trichloroethene)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	13
Number of Detects	5	Number of Non-Detects	90
Number of Distinct Detects	5	Number of Distinct Non-Detects	8
Minimum Detect	0.3	Minimum Non-Detect	0.5
Maximum Detect	1.5	Maximum Non-Detect	25
Variance Detects	0.244	Percent Non-Detects	94.74%
Mean Detects	0.934	SD Detects	0.494
Median Detects	0.98	CV Detects	0.529
Skewness Detects	-0.225	Kurtosis Detects	-1.791
Mean of Logged Detects	-0.217	SD of Logged Detects	0.657

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.171	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.345	KM Standard Error of Mean	0.0259
KM SD	0.196	95% KM (BCA) UCL	0.559
95% KM (t) UCL	0.388	95% KM (Percentile Bootstrap) UCL	0.554
95% KM (z) UCL	0.388	95% KM Bootstrap t UCL	0.372
90% KM Chebyshev UCL	0.423	95% KM Chebyshev UCL	0.458
97.5% KM Chebyshev UCL	0.507	99% KM Chebyshev UCL	0.603

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.274	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.682	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.206	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.359	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.525	k star (bias corrected MLE)	1.543
Theta hat (MLE)	0.265	Theta star (bias corrected MLE)	0.605
nu hat (MLE)	35.25	nu star (bias corrected)	15.43
Mean (detects)	0.934		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.28
Maximum	1.5	Median	0.209
SD	0.287	CV	1.026
k hat (MLE)	0.736	k star (bias corrected MLE)	0.72
Theta hat (MLE)	0.381	Theta star (bias corrected MLE)	0.389
nu hat (MLE)	139.8	nu star (bias corrected)	136.7
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (136.72, α)	110.7	Adjusted Chi Square Value (136.72, β)	110.3
95% Gamma Approximate UCL (use when n>=50)	0.346	95% Gamma Adjusted UCL (use when n<50)	0.347

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.345	SD (KM)	0.196
Variance (KM)	0.0383	SE of Mean (KM)	0.0259
k hat (KM)	3.113	k star (KM)	3.021
nu hat (KM)	591.4	nu star (KM)	574.1
theta hat (KM)	0.111	theta star (KM)	0.114
80% gamma percentile (KM)	0.492	90% gamma percentile (KM)	0.612
95% gamma percentile (KM)	0.723	99% gamma percentile (KM)	0.965

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (574.08, α)	519.5	Adjusted Chi Square Value (574.08, β)	518.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.382	95% Gamma Adjusted KM-UCL (use when n<50)	0.382

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.218	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.347	Mean in Log Scale	-1.229
SD in Original Scale	0.231	SD in Log Scale	0.576

95% t UCL (assumes normality of ROS data)	0.386	95% Percentile Bootstrap UCL	0.387
95% BCA Bootstrap UCL	0.395	95% Bootstrap t UCL	0.397
95% H-UCL (Log ROS)	0.387		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.131	KM Geo Mean	0.323
KM SD (logged)	0.297	95% Critical H Value (KM-Log)	1.744
KM Standard Error of Mean (logged)	0.0404	95% H-UCL (KM -Log)	0.356
KM SD (logged)	0.297	95% Critical H Value (KM-Log)	1.744
KM Standard Error of Mean (logged)	0.0404		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.265	Mean in Log Scale	-0.691
SD in Original Scale	2.674	SD in Log Scale	1.072
95% t UCL (Assumes normality)	1.721	95% H-Stat UCL	1.15

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.388

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (vinyl chloride)

General Statistics

Total Number of Observations	95	Number of Distinct Observations	29
Number of Detects	26	Number of Non-Detects	69
Number of Distinct Detects	24	Number of Distinct Non-Detects	6
Minimum Detect	0.13	Minimum Non-Detect	0.5
Maximum Detect	1000	Maximum Non-Detect	20
Variance Detects	85834	Percent Non-Detects	72.63%
Mean Detects	120.4	SD Detects	293
Median Detects	2.95	CV Detects	2.434
Skewness Detects	2.629	Kurtosis Detects	5.675
Mean of Logged Detects	1.789	SD of Logged Detects	2.671

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.456	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.393	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.17	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	33.15	KM Standard Error of Mean	16.69
KM SD	159.5	95% KM (BCA) UCL	61.45
95% KM (t) UCL	60.88	95% KM (Percentile Bootstrap) UCL	63.14
95% KM (z) UCL	60.61	95% KM Bootstrap t UCL	83.85
90% KM Chebyshev UCL	83.23	95% KM Chebyshev UCL	105.9
97.5% KM Chebyshev UCL	137.4	99% KM Chebyshev UCL	199.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.141	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.882	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.242	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.189	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.238	k star (bias corrected MLE)	0.237
Theta hat (MLE)	504.8	Theta star (bias corrected MLE)	508.8
nu hat (MLE)	12.4	nu star (bias corrected)	12.3
Mean (detects)	120.4		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	32.95
Maximum	1000	Median	0.01
SD	160.4	CV	4.869
k hat (MLE)	0.124	k star (bias corrected MLE)	0.127
Theta hat (MLE)	265.1	Theta star (bias corrected MLE)	258.6
nu hat (MLE)	23.61	nu star (bias corrected)	24.2
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (24.20, α)	14	Adjusted Chi Square Value (24.20, β)	13.88
95% Gamma Approximate UCL (use when n>=50)	56.94	95% Gamma Adjusted UCL (use when n<50)	57.44

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	33.15	SD (KM)	159.5
Variance (KM)	25453	SE of Mean (KM)	16.69
k hat (KM)	0.0432	k star (KM)	0.0488
nu hat (KM)	8.204	nu star (KM)	9.278
theta hat (KM)	767.8	theta star (KM)	678.9
80% gamma percentile (KM)	4.131	90% gamma percentile (KM)	49.04
95% gamma percentile (KM)	174.8	99% gamma percentile (KM)	727.9

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.28, α)	3.496	Adjusted Chi Square Value (9.28, β)	3.441
95% Gamma Approximate KM-UCL (use when n>=50)	87.99	95% Gamma Adjusted KM-UCL (use when n<50)	89.38

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.92	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.156	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.17	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	33.24	Mean in Log Scale	-1.084
SD in Original Scale	160.4	SD in Log Scale	2.802

95% t UCL (assumes normality of ROS data)	60.57	95% Percentile Bootstrap UCL	62.85
95% BCA Bootstrap UCL	72.8	95% Bootstrap t UCL	82.62
95% H-UCL (Log ROS)	62.29		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.488	KM Geo Mean	0.614
KM SD (logged)	1.99	95% Critical H Value (KM-Log)	3.392
KM Standard Error of Mean (logged)	0.241	95% H-UCL (KM -Log)	8.927
KM SD (logged)	1.99	95% Critical H Value (KM-Log)	3.392
KM Standard Error of Mean (logged)	0.241		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	33.42	Mean in Log Scale	-0.202
SD in Original Scale	160.3	SD in Log Scale	1.95
95% t UCL (Assumes normality)	60.75	95% H-Stat UCL	10.71

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	105.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (xylenes (total))

General Statistics

Total Number of Observations	95	Number of Distinct Observations	24
Number of Detects	18	Number of Non-Detects	77
Number of Distinct Detects	16	Number of Distinct Non-Detects	8
Minimum Detect	0.19	Minimum Non-Detect	0.5
Maximum Detect	61	Maximum Non-Detect	25
Variance Detects	352.2	Percent Non-Detects	81.05%
Mean Detects	8.842	SD Detects	18.77
Median Detects	0.75	CV Detects	2.122
Skewness Detects	2.147	Kurtosis Detects	3.352
Mean of Logged Detects	0.278	SD of Logged Detects	1.799

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.515	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.456	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.954	KM Standard Error of Mean	0.91
KM SD	8.611	95% KM (BCA) UCL	3.472
95% KM (t) UCL	3.466	95% KM (Percentile Bootstrap) UCL	3.621
95% KM (z) UCL	3.451	95% KM Bootstrap t UCL	18.95
90% KM Chebyshev UCL	4.684	95% KM Chebyshev UCL	5.921
97.5% KM Chebyshev UCL	7.637	99% KM Chebyshev UCL	11.01

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.76	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.831	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.354	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.219	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.353	k star (bias corrected MLE)	0.331
Theta hat (MLE)	25.04	Theta star (bias corrected MLE)	26.69
nu hat (MLE)	12.71	nu star (bias corrected)	11.93
Mean (detects)	8.842		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.823
Maximum	61	Median	0.01
SD	8.727	CV	4.786
k hat (MLE)	0.182	k star (bias corrected MLE)	0.184
Theta hat (MLE)	10	Theta star (bias corrected MLE)	9.933
nu hat (MLE)	34.64	nu star (bias corrected)	34.88
Adjusted Level of Significance (β)	0.0475		
Approximate Chi Square Value (34.88, α)	22.37	Adjusted Chi Square Value (34.88, β)	22.21
95% Gamma Approximate UCL (use when n>=50)	2.843	95% Gamma Adjusted UCL (use when n<50)	2.863

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.954	SD (KM)	8.611
Variance (KM)	74.16	SE of Mean (KM)	0.91
k hat (KM)	0.0515	k star (KM)	0.0569
nu hat (KM)	9.786	nu star (KM)	10.81
theta hat (KM)	37.94	theta star (KM)	34.35
80% gamma percentile (KM)	0.404	90% gamma percentile (KM)	3.479
95% gamma percentile (KM)	10.82	99% gamma percentile (KM)	40.33

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.81, α)	4.455	Adjusted Chi Square Value (10.81, β)	4.392
95% Gamma Approximate KM-UCL (use when n>=50)	4.743	95% Gamma Adjusted KM-UCL (use when n<50)	4.811

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.802	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.263	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.954	Mean in Log Scale	-1.233
SD in Original Scale	8.661	SD in Log Scale	1.456

95% t UCL (assumes normality of ROS data)	3.43	95% Percentile Bootstrap UCL	3.512
95% BCA Bootstrap UCL	4.168	95% Bootstrap t UCL	23.2
95% H-UCL (Log ROS)	1.27		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.893	KM Geo Mean	0.409
KM SD (logged)	1.02	95% Critical H Value (KM-Log)	2.27
KM Standard Error of Mean (logged)	0.162	95% H-UCL (KM -Log)	0.874
KM SD (logged)	1.02	95% Critical H Value (KM-Log)	2.27
KM Standard Error of Mean (logged)	0.162		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.849	Mean in Log Scale	-0.459
SD in Original Scale	8.897	SD in Log Scale	1.334
95% t UCL (Assumes normality)	4.365	95% H-Stat UCL	2.198

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	5.921

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX O

RSL Calculator Output for Detection Limit Calculations

Site-specific
Resident Equation Inputs for Soil

*** Inputted values different from Resident defaults are highlighted.**

Variable	Resident Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
A (VF Dispersion Constant)	11.911	11.911
A (VF Dispersion Constant - Mass Limit)	11.911	11.911
B (PEF Dispersion Constant)	18.7762	18.7762
B (VF Dispersion Constant)	18.4385	18.4385
B (VF Dispersion Constant - Mass Limit)	18.4385	18.4385
$City_{PEF}$ (Climate Zone) Selection	Default	Default
$City_{VF}$ (Climate Zone) Selection	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
C (VF Dispersion Constant)	209.7845	209.7845
C (VF Dispersion Constant - Mass Limit)	209.7845	209.7845
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
ρ_b (dry soil bulk density) g/cm ^{3}	1.5	1.5
ρ_b (dry soil bulk density - mass limit) g/cm ^{3}	1.5	1.5
PEF (particulate emission factor) m ^{3}/kg	1359344438	1359344438
ρ_s (soil particle density) g/cm ^{3}	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	68.18
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	68.18
A_s (PEF acres)	0.5	0.5
A_s (VF acres)	0.5	0.5
A_s (VF mass-limit acres)	0.5	0.5
AF_{0-2} (mutagenic skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{2-6} (mutagenic skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{6-16} (mutagenic skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{16-26} (mutagenic skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{res-a} (skin adherence factor - adult) mg/cm ^{2}	0.07	0.07
AF_{res-c} (skin adherence factor - child) mg/cm ^{2}	0.2	0.2

Output generated 02MAY2019:16:21:25

Site-specific
Resident Equation Inputs for Soil

*** Inputted values different from Resident defaults are highlighted.**

Variable	Resident Soil Default Value	Form-input Value
AT_{res} (averaging time - resident carcinogenic)	365	365
BW_{0-2} (mutagenic body weight) kg	15	15
BW_{2-6} (mutagenic body weight) kg	15	15
BW_{6-16} (mutagenic body weight) kg	80	80
BW_{16-26} (mutagenic body weight) kg	80	80
BW_{res-a} (body weight - adult) kg	80	80
BW_{res-c} (body weight - child) kg	15	15
$DFS_{res-adj}$ (age-adjusted soil dermal factor) mg/kg	103390	103390
$DFSM_{res-adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	428260	428260
ED_{res} (exposure duration) years	26	26
ED_{0-2} (mutagenic exposure duration) years	2	2
ED_{2-6} (mutagenic exposure duration) years	4	4
ED_{6-16} (mutagenic exposure duration) years	10	10
ED_{16-26} (mutagenic exposure duration) years	10	10
ED_{res-a} (exposure duration - adult) years	20	20
ED_{res-c} (exposure duration - child) years	6	6
EF_{res} (exposure frequency) days/year	350	350
EF_{0-2} (mutagenic exposure frequency) days/year	350	350
EF_{2-6} (mutagenic exposure frequency) days/year	350	350
EF_{6-16} (mutagenic exposure frequency) days/year	350	350
EF_{16-26} (mutagenic exposure frequency) days/year	350	350
EF_{res-a} (exposure frequency - adult) days/year	350	350
EF_{res-c} (exposure frequency - child) days/year	350	350
ET_{res} (exposure time) hours/day	24	24
ET_{0-2} (mutagenic exposure time) hours/day	24	24
ET_{2-6} (mutagenic exposure time) hours/day	24	24
ET_{6-16} (mutagenic exposure time) hours/day	24	24
ET_{16-26} (mutagenic exposure time) hours/day	24	24
ET_{res-a} (adult exposure time) hours/day	24	24
ET_{res-c} (child exposure time) hours/day	24	24

Site-specific
Resident Equation Inputs for Soil

*** Inputted values different from Resident defaults are highlighted.**

Variable	Resident Soil Default Value	Form-input Value
THQ (target hazard quotient) unitless	0.1	0.1
$IFS_{res\text{-}adj}$ (age-adjusted soil ingestion factor) mg/kg	36750	36750
$IFSM_{res\text{-}adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	166833.3	166833.3
$IRS_{0\text{-}2}$ (mutagenic soil intake rate) mg/day	200	200
$IRS_{2\text{-}6}$ (mutagenic soil intake rate) mg/day	200	200
$IRS_{6\text{-}16}$ (mutagenic soil intake rate) mg/day	100	100
$IRS_{16\text{-}26}$ (mutagenic soil intake rate) mg/day	100	100
$IRS_{res\text{-}a}$ (soil intake rate - adult) mg/day	100	100
$IRS_{res\text{-}c}$ (soil intake rate - child) mg/day	200	200
LT (lifetime) years	70	70
$SA_{0\text{-}2}$ (mutagenic skin surface area) cm^2/day	2373	2373
$SA_{2\text{-}6}$ (mutagenic skin surface area) cm^2/day	2373	2373
$SA_{6\text{-}16}$ (mutagenic skin surface area) cm^2/day	6032	6032
$SA_{16\text{-}26}$ (mutagenic skin surface area) cm^2/day	6032	6032
$SA_{res\text{-}a}$ (skin surface area - adult) cm^2/day	6032	6032
$SA_{res\text{-}c}$ (skin surface area - child) cm^2/day	2373	2373
TR (target risk) unitless	1.0E-06	1.0E-06
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Resident Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	SF_o (mg/kg-day)$^{-1}$	SF_o Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA
Arsenic, Inorganic	7440-38-2	No	No	1.50E+00	U	4.30E-03	U	3.00E-04	U	1.50E-05	U	1	0.03	0.6
Benzoic Acid	65-85-0	No	No	-		-		4.00E+00	U	-		1	0.1	1
Chlorobenzene	108-90-7	No	Yes	-		-		2.00E-02	U	5.00E-02	U	1	-	1
Dichlorobenzene, 1,2-	95-50-1	No	Yes	-		-		9.00E-02	U	2.00E-01	U	1	-	1
Dichloroethylene, 1,2-trans-	156-60-5	No	Yes	-		-		2.00E-02	U	-		1	-	1
Selenium	7782-49-2	No	No	-		-		5.00E-03	U	2.00E-02	U	1	-	1
Styrene	100-42-5	No	Yes	-		-		2.00E-01	U	1.00E+00	U	1	-	1
Trichlorobenzene, 1,2,4-	120-82-1	No	Yes	2.90E-02	U	-		1.00E-02	U	2.00E-03	U	1	-	1

Site-specific
Resident Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Chemical	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc}\ (cm^3/g)	K_d\ (cm^3/g)	HLC (atm-m^3/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref
Arsenic, Inorganic	-	-	-	2.90E+01	-	-		888.15	U	1670	U
Benzoic Acid	-	3.40E+03	6.00E-01	-	3.81E-08	1.56E-06	U	522.15	U	751	U
Chlorobenzene	7.61E+02	4.98E+02	2.34E+02	1.40E+00	3.11E-03	1.27E-01	U	405.15	U	632	U
Dichlorobenzene, 1,2-	3.76E+02	1.56E+02	3.83E+02	2.30E+00	1.92E-03	7.85E-02	U	453.15	U	705	U
Dichloroethylene, 1,2-trans-	1.85E+03	4.52E+03	3.96E+01	2.38E-01	9.38E-03	3.83E-01	U	321.85	U	516	U
Selenium	-	-	-	5.00E+00	-	-		958.15	U	1770	U
Styrene	8.67E+02	3.10E+02	4.46E+02	2.68E+00	2.75E-03	1.12E-01	U	418.15	U	635	U
Trichlorobenzene, 1,2,4-	4.05E+02	4.90E+01	1.36E+03	8.16E+00	1.42E-03	5.81E-02	U	487.15	U	725	U

Site-specific
Resident Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Chemical	Chemical Type	D_{ia} \ (cm^2/s)	D_{iw} \ (cm^2/s)	D_A \ (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)
Arsenic, Inorganic	INORGANIC	-	-	-	1.36E+09	-	7.72E-01	5.49E+00	8.88E+02	6.77E-01
Benzoic Acid	SVOC	7.02E-02	9.79E-06	-	1.36E+09	-	-	-	-	-
Chlorobenzene	VOC	7.21E-02	9.48E-06	3.20E-04	1.36E+09	6.45E+03	-	-	-	-
Dichlorobenzene, 1,2-	VOC	5.62E-02	8.92E-06	9.74E-05	1.36E+09	1.17E+04	-	-	-	-
Dichloroethylene, 1,2-trans-	VOC	8.76E-02	1.12E-05	4.36E-03	1.36E+09	1.75E+03	-	-	-	-
Selenium	INORGANIC	-	-	-	1.36E+09	-	-	-	-	-
Styrene	VOC	7.11E-02	8.78E-06	1.52E-04	1.36E+09	9.35E+03	-	-	-	-
Trichlorobenzene, 1,2,4-	VOC	3.96E-02	8.40E-06	1.48E-05	1.36E+09	3.00E+04	2.40E+01	-	-	2.40E+01

Site-specific
Resident Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Chemical	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)	Noncarcinogenic SL Child THI=0.1 (mg/kg)	Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	Inhalation SL Adult THQ=0.1 (mg/kg)	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
Arsenic, Inorganic	3.91E+00	3.30E+01	2.13E+03	3.49E+00	4.17E+01	1.98E+02	2.13E+03	3.39E+01	6.77E-01 ca**
Benzoic Acid	3.13E+04	1.32E+05	-	2.53E+04	3.34E+05	7.90E+05	-	2.35E+05	2.53E+04 nc
Chlorobenzene	1.56E+02	-	3.36E+01	2.77E+01	1.67E+03	-	3.36E+01	3.30E+01	2.77E+01 nc
Dichlorobenzene, 1,2-	7.04E+02	-	2.44E+02	1.81E+02	7.51E+03	-	2.44E+02	2.36E+02	1.81E+02 nc
Dichloroethylene, 1,2-trans-	1.56E+02	-	-	1.56E+02	1.67E+03	-	-	1.67E+03	1.56E+02 nc
Selenium	3.91E+01	-	2.84E+06	3.91E+01	4.17E+02	-	2.84E+06	4.17E+02	3.91E+01 nc
Styrene	1.56E+03	-	9.75E+02	6.00E+02	1.67E+04	-	9.75E+02	9.21E+02	6.00E+02 nc
Trichlorobenzene, 1,2,4-	7.82E+01	-	6.25E+00	5.79E+00	8.34E+02	-	6.25E+00	6.20E+00	5.79E+00 nc

Site-specific
Resident Risk for Soil

Chemical	SF_o (mg/kg-day) $^{-1}$	SF_o Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc} \ (cm^3/g)	K_d \ (cm^3/g)	HLC (atm-m^3/mole)
Arsenic, Inorganic	1.50E+00	U	4.30E-03	U	3.00E-04	U	1.50E-05	U	1	0.03	0.6	-	-	-	2.90E+01	-
Benzoic Acid	-		-		4.00E+00	U	-		1	0.1	1	-	3.40E+03	6.00E-01	-	3.81E-08
Chlorobenzene	-		-		2.00E-02	U	5.00E-02	U	1	-	1	7.61E+02	4.98E+02	2.34E+02	1.40E+00	3.11E-03
Dichlorobenzene, 1,2-	-		-		9.00E-02	U	2.00E-01	U	1	-	1	3.76E+02	1.56E+02	3.83E+02	2.30E+00	1.92E-03
Dichloroethylene, 1,2-trans-	-		-		2.00E-02	U	-		1	-	1	1.85E+03	4.52E+03	3.96E+01	2.38E-01	9.38E-03
Selenium	-		-		5.00E-03	U	2.00E-02	U	1	-	1	-	-	-	5.00E+00	-
Styrene	-		-		2.00E-01	U	1.00E+00	U	1	-	1	8.67E+02	3.10E+02	4.46E+02	2.68E+00	2.75E-03
Trichlorobenzene, 1,2,4-	2.90E-02	U	-		1.00E-02	U	2.00E-03	U	1	-	1	4.05E+02	4.90E+01	1.36E+03	8.16E+00	1.42E-03
*Total Risk/HI	-		-		-		-		-	-	-	-	-	-	-	-

Output generated 02MAY2019:16:21:25

Site-specific
Resident Risk for Soil

Chemical	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia} \ (cm^2/s)	D_{iw} \ (cm^2/s)	D_A \ (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Concentration (mg/kg)	Ingestion Risk
Arsenic, Inorganic	-		888.15	U	1670	U	INORGANIC	-	-	-	1.36E+09	-	2.90E+00	3.75E-06
Benzoic Acid	1.56E-06	U	522.15	U	751	U	SVOC	7.02E-02	9.79E-06	-	1.36E+09	-	8.20E+00	-
Chlorobenzene	1.27E-01	U	405.15	U	632	U	VOC	7.21E-02	9.48E-06	3.20E-04	1.36E+09	6.45E+03	1.60E+00	-
Dichlorobenzene, 1,2-	7.85E-02	U	453.15	U	705	U	VOC	5.62E-02	8.92E-06	9.74E-05	1.36E+09	1.17E+04	3.90E+00	-
Dichloroethylene, 1,2-trans-	3.83E-01	U	321.85	U	516	U	VOC	8.76E-02	1.12E-05	4.36E-03	1.36E+09	1.75E+03	1.60E+00	-
Selenium	-		958.15	U	1770	U	INORGANIC	-	-	-	1.36E+09	-	2.90E+00	-
Styrene	1.12E-01	U	418.15	U	635	U	VOC	7.11E-02	8.78E-06	1.52E-04	1.36E+09	9.35E+03	2.50E+00	-
Trichlorobenzene, 1,2,4-	5.81E-02	U	487.15	U	725	U	VOC	3.96E-02	8.40E-06	1.48E-05	1.36E+09	3.00E+04	1.60E+00	6.67E-08
*Total Risk/HI	-		-		-			-	-	-	-	-	-	3.82E-06

Output generated 02MAY2019:16:21:25

Site-specific
Resident Risk for Soil

Chemical	Dermal Risk	Inhalation Risk	Carcinogenic Risk	Ingestion Child HQ	Dermal Child HQ	Inhalation Child HQ	Noncarcinogenic Child HI	Ingestion Adult HQ	Dermal Adult HQ	Inhalation Adult HQ	Noncarcinogenic Adult HI
Arsenic, Inorganic	5.28E-07	3.27E-09	4.29E-06	7.42E-02	8.80E-03	1.36E-04	8.31E-02	6.95E-03	1.47E-03	1.36E-04	8.56E-03
Benzoic Acid	-	-	-	2.62E-05	6.22E-06	-	3.24E-05	2.46E-06	1.04E-06	-	3.49E-06
Chlorobenzene	-	-	-	1.02E-03	-	4.76E-03	5.78E-03	9.59E-05	-	4.76E-03	4.85E-03
Dichlorobenzene, 1,2-	-	-	-	5.54E-04	-	1.60E-03	2.15E-03	5.19E-05	-	1.60E-03	1.65E-03
Dichloroethylene, 1,2-trans-	-	-	-	1.02E-03	-	-	1.02E-03	9.59E-05	-	-	9.59E-05
Selenium	-	-	-	7.42E-03	-	1.02E-07	7.42E-03	6.95E-04	-	1.02E-07	6.95E-04
Styrene	-	-	-	1.60E-04	-	2.57E-04	4.16E-04	1.50E-05	-	2.57E-04	2.72E-04
Trichlorobenzene, 1,2,4-	-	-	6.67E-08	2.05E-03	-	2.56E-02	2.77E-02	1.92E-04	-	2.56E-02	2.58E-02
*Total Risk/HI	5.28E-07	3.27E-09	4.35E-06	8.64E-02	8.80E-03	3.24E-02	1.28E-01	8.10E-03	1.47E-03	3.24E-02	4.19E-02

Site-specific
Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

Variable	Resident Tap Water Default Value	Form-input Value
BW_{0-2} (mutagenic body weight) kg	15	15
BW_{2-6} (mutagenic body weight) kg	15	15
BW_{6-16} (mutagenic body weight) kg	80	80
BW_{16-26} (mutagenic body weight) kg	80	80
BW_{res-a} (body weight - adult) kg	80	80
BW_{res-c} (body weight - child) kg	15	15
$DFW_{res-adj}$ (age-adjusted dermal factor) cm^2-event/kg	2610650	2610650
$DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	8191633	8191633
ED_{res} (exposure duration - resident) years	26	26
ED_{0-2} (mutagenic exposure duration first phase) years	2	2
ED_{2-6} (mutagenic exposure duration second phase) years	4	4
ED_{6-16} (mutagenic exposure duration third phase) years	10	10
ED_{16-26} (mutagenic exposure duration fourth phase) years	10	10
ED_{res-a} (exposure duration - adult) years	20	20
ED_{res-c} (exposure duration - child) years	6	6
EF_{res} (exposure frequency) days/year	350	350
EF_{0-2} (mutagenic exposure frequency first phase) days/year	350	350
EF_{2-6} (mutagenic exposure frequency second phase) days/year	350	350
EF_{6-16} (mutagenic exposure frequency third phase) days/year	350	350
EF_{16-26} (mutagenic exposure frequency fourth phase) days/year	350	350
EF_{res-a} (exposure frequency - adult) days/year	350	350
EF_{res-c} (exposure frequency - child) days/year	350	350
ET_{res} (exposure time) hours/day	24	24
$ET_{event-res-adj}$ (age-adjusted exposure time) hours/event	0.67077	0.67077
$ET_{event-res-madj}$ (mutagenic age-adjusted exposure time) hours/event	0.67077	0.67077
ET_{0-2} (mutagenic dermal exposure time first phase) hours/event	0.54	0.54
ET_{2-6} (mutagenic dermal exposure time second phase) hours/event	0.54	0.54
ET_{6-16} (mutagenic dermal exposure time third phase) hours/event	0.71	0.71
ET_{16-26} (mutagenic dermal exposure time fourth phase) hours/event	0.71	0.71

Output generated 02MAY2019:16:29:15

Site-specific
Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

Variable	Resident Tap Water Default Value	Form-input Value
ET_{res-a} (dermal exposure time - adult) hours/event	0.71	0.71
ET_{res-c} (dermal exposure time - child) hours/event	0.54	0.54
ET_{0-2} (mutagenic inhalation exposure time first phase) hours/day	24	24
ET_{2-6} (mutagenic inhalation exposure time second phase) hours/day	24	24
ET_{6-16} (mutagenic inhalation exposure time third phase) hours/day	24	24
ET_{16-26} (mutagenic inhalation exposure time fourth phase) hours/day	24	24
ET_{res-a} (inhalation exposure time - adult) hours/day	24	24
ET_{res-c} (inhalation exposure time - child) hours/day	24	24
EV_{0-2} (mutagenic events) per day	1	1
EV_{2-6} (mutagenic events) per day	1	1
EV_{6-16} (mutagenic events) per day	1	1
EV_{16-26} (mutagenic events) per day	1	1
EV_{res-a} (events - adult) per day	1	1
EV_{res-c} (events - child) per day	1	1
THQ (target hazard quotient) unitless	0.1	0.1
$IFW_{res-adj}$ (adjusted intake factor) L/kg	327.95	327.95
$IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg	1019.9	1019.9
IRW_{0-2} (mutagenic water intake rate) L/day	0.78	0.78
IRW_{2-6} (mutagenic water intake rate) L/day	0.78	0.78
IRW_{6-16} (mutagenic water intake rate) L/day	2.5	2.5
IRW_{16-26} (mutagenic water intake rate) L/day	2.5	2.5
IRW_{res-a} (water intake rate - adult) L/day	2.5	2.5
IRW_{res-c} (water intake rate - child) L/day	0.78	0.78
K (volatilization factor of Andelman) L/m^3	0.5	0.5
LT (lifetime) years	70	70
SA_{0-2} (mutagenic skin surface area) cm^2	6365	6365
SA_{2-6} (mutagenic skin surface area) cm^2	6365	6365
SA_{6-16} (mutagenic skin surface area) cm^2	19652	19652
SA_{16-26} (mutagenic skin surface area) cm^2	19652	19652

Output generated 02MAY2019:16:29:15

Site-specific
Resident Equation Inputs for Tap Water

*** Inputted values different from Resident defaults are highlighted.**

Variable	Resident Tap Water Default Value	Form-input Value
$SA_{res,a}$ (skin surface area - adult) cm^2	19652	19652
$SA_{res,c}$ (skin surface area - child) cm^2	6365	6365
l_{sc} (apparent thickness of stratum corneum) cm	0.001	0.001
TR (target risk) unitless	1.0E-06	1.0E-06

Site-specific
Resident Regional Screening Levels (RSL) for Tap Water

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	SF_o (mg/kg-day)$^{-1}$	SF_o Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	K_p (cm/hr)	MW
Benzo[b]fluoranthene	205-99-2	Yes	No	1.00E-01	E	6.00E-05	E	-		-		1	4.17E-01	252.32
Benzo[k]fluoranthene	207-08-9	Yes	No	1.00E-02	E	6.00E-06	E	-		-		1	6.91E-01	252.32
Chlorobenzene	108-90-7	No	Yes	-		-		2.00E-02	I	5.00E-02	P	1	2.82E-02	112.56
Chloromethane	74-87-3	No	Yes	-		-		-		9.00E-02	I	1	3.28E-03	50.488
Dichloroethylene, 1,1-	75-35-4	No	Yes	-		-		5.00E-02	I	2.00E-01	I	1	1.17E-02	96.944
Methyl tert-Butyl Ether (MTBE)	1634-04-4	No	Yes	1.80E-03	C	2.60E-07	C	-		3.00E+00	I	1	2.11E-03	88.151

Chemical	B (unitless)	t^* (hr)	τ_{event} (hr/event)	FA (unitless)	In EPD?	$DA_{event\ (ca)}$	DA_{event} (nc child)	DA_{event} (nc adult)	MCL (ug/L)	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Inhalation SL TR=1E-06 (ug/L)
Benzo[b]fluoranthene	2.55E+00	1.13E+01	2.72E+00	1	No	-	-	-	-	2.51E-01	-	-
Benzo[k]fluoranthene	4.22E+00	1.18E+01	2.72E+00	0.9	No	-	-	-	-	2.51E+00	-	-
Chlorobenzene	1.15E-01	1.08E+00	4.49E-01	1	Yes	-	4.92E-03	8.49E-03	1.00E+02	-	-	-
Chloromethane	8.96E-03	4.84E-01	2.02E-01	1	Yes	-	-	-	-	-	-	-
Dichloroethylene, 1,1-	4.43E-02	8.81E-01	3.67E-01	1	Yes	-	1.23E-02	2.12E-02	7.00E+00	-	-	-
Methyl tert-Butyl Ether (MTBE)	7.62E-03	7.87E-01	3.28E-01	1	Yes	5.44E-03	-	-	-	4.33E+01	1.99E+03	2.16E+01

Chemical	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL Child THQ=0.1 (ug/L)	Dermal SL Child THQ=0.1 (ug/L)	Inhalation SL Child THQ=0.1 (ug/L)	Noncarcinogenic SL Child THI=0.1 (ug/L)	Ingestion SL Adult THQ=0.1 (ug/L)	Dermal SL Adult THQ=0.1 (ug/L)	Inhalation SL Adult THQ=0.1 (ug/L)	Noncarcinogenic SL Adult THI=0.1 (ug/L)	Screening Level (ug/L)
Benzo[b]fluoranthene	2.51E-01	-	-	-	-	-	-	-	-	2.51E-01 ca
Benzo[k]fluoranthene	2.51E+00	-	-	-	-	-	-	-	-	2.51E+00 ca
Chlorobenzene	-	4.01E+01	1.28E+02	1.04E+01	7.77E+00	6.67E+01	1.93E+02	1.04E+01	8.62E+00	7.77E+00 nc
Chloromethane	-	-	-	1.88E+01	1.88E+01	-	-	1.88E+01	1.88E+01	1.88E+01 nc
Dichloroethylene, 1,1-	-	1.00E+02	8.54E+02	4.17E+01	2.85E+01	1.67E+02	1.29E+03	4.17E+01	3.25E+01	2.85E+01 nc
Methyl tert-Butyl Ether (MTBE)	1.43E+01	-	-	6.26E+02	6.26E+02	-	-	6.26E+02	6.26E+02	1.43E+01 ca*

Site-specific
Resident Risk for Tap Water

Chemical	SF_o (mg/kg-day)$^{-1}$	SF_o Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	K_p \ (cm/hr)	MW	B (unitless)	t^* (hr)
Benzo[b]fluoranthene	1.00E-01	E	6.00E-05	E	-		-		1	4.17E-01	252.32	2.55E+00	1.13E+01
Benzo[k]fluoranthene	1.00E-02	E	6.00E-06	E	-		-		1	6.91E-01	252.32	4.22E+00	1.18E+01
Chlorobenzene	-		-		2.00E-02	I	5.00E-02	P	1	2.82E-02	112.56	1.15E-01	1.08E+00
Chloromethane	-		-		-		9.00E-02	I	1	3.28E-03	50.488	8.96E-03	4.84E-01
Dichloroethylene, 1,1-	-		-		5.00E-02	I	2.00E-01	I	1	1.17E-02	96.944	4.43E-02	8.81E-01
Methyl tert-Butyl Ether (MTBE)	1.80E-03	C	2.60E-07	C	-		3.00E+00	I	1	2.11E-03	88.151	7.62E-03	7.87E-01
*Total Risk/HI	-		-		-		-		-	-	-	-	-

Chemical	τ_{event} (hr/event)	FA (unitless)	In EPD?	$DA_{event\ (ca)}$	DA_{event} (nc child)	DA_{event} (nc adult)	MCL (ug/L)	Concentration (ug/L)	Ingestion Risk	Dermal Risk	Inhalation Risk
Benzo[b]fluoranthene	2.72E+00	1	No	-	-	-	-	1.00E+01	3.99E-05	-	-
Benzo[k]fluoranthene	2.72E+00	0.9	No	-	-	-	-	1.00E+01	3.99E-06	-	-
Chlorobenzene	4.49E-01	1	Yes	-	4.92E-03	8.49E-03	1.00E+02	4.00E+01	-	-	-
Chloromethane	2.02E-01	1	Yes	-	-	-	-	2.50E+01	-	-	-
Dichloroethylene, 1,1-	3.67E-01	1	Yes	-	1.23E-02	2.12E-02	7.00E+00	2.50E+01	-	-	-
Methyl tert-Butyl Ether (MTBE)	3.28E-01	1	Yes	5.44E-03	-	-	-	2.50E+01	5.78E-07	1.26E-08	1.16E-06
*Total Risk/HI	-	-		-	-	-	-	-	*4.45E-05*	*1.26E-08*	*1.16E-06*

Chemical	Carcinogenic Risk	Ingestion Child HQ	Dermal Child HQ	Inhalation Child HQ	Noncarcinogenic Child HI	Ingestion Adult HQ	Dermal Adult HQ	Inhalation Adult HQ	Noncarcinogenic Adult HI
Benzo[b]fluoranthene	3.99E-05	-	-	-	-	-	-	-	-
Benzo[k]fluoranthene	3.99E-06	-	-	-	-	-	-	-	-
Chlorobenzene	-	9.97E-02	3.12E-02	3.84E-01	5.15E-01	5.99E-02	2.07E-02	3.84E-01	4.64E-01
Chloromethane	-	-	-	1.33E-01	1.33E-01	-	-	1.33E-01	1.33E-01
Dichloroethylene, 1,1-	-	2.49E-02	2.93E-03	5.99E-02	8.78E-02	1.50E-02	1.94E-03	5.99E-02	7.69E-02
Methyl tert-Butyl Ether (MTBE)	1.75E-06	-	-	4.00E-03	4.00E-03	-	-	4.00E-03	4.00E-03
*Total Risk/HI	*4.57E-05*	*1.25E-01*	*3.42E-02*	*5.81E-01*	*7.39E-01*	*7.49E-02*	*2.27E-02*	*5.81E-01*	*6.78E-01*

Site-specific
Recreator Equation Inputs for Soil

*** Inputted values different from Recreator defaults are highlighted.**

Variable	Recreator Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
A (VF Dispersion Constant)	11.911	11.911
A (VF Dispersion Constant - Mass Limit)	11.911	11.911
B (PEF Dispersion Constant)	18.7762	18.7762
B (VF Dispersion Constant)	18.4385	18.4385
B (VF Dispersion Constant - Mass Limit)	18.4385	18.4385
$City_{PEF}$ (Climate Zone) Selection	Default	Default
$City_{VF}$ (Climate Zone) Selection	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
C (VF Dispersion Constant)	209.7845	209.7845
C (VF Dispersion Constant - Mass Limit)	209.7845	209.7845
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
ρ_b (dry soil bulk density) g/cm ^{3}	1.5	1.5
ρ_b (dry soil bulk density - mass limit) g/cm ^{3}	1.5	1.5
PEF (particulate emission factor) m ^{3}/kg	1359344438	1359344438
ρ_s (soil particle density) g/cm ^{3}	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	68.18
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	68.18
A_s (PEF acres)	0.5	0.5
A_s (VF acres)	0.5	0.5
A_s (VF mass-limit acres)	0.5	0.5
AF_{0-2} (skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{2-6} (skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{6-16} (skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{16-30} (skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{rec-a} (skin adherence factor - adult) mg/cm ^{2}	0.07	0.07
AF_{rec-c} (skin adherence factor - child) mg/cm ^{2}	0.2	0.2

Output generated 02MAY2019:13:12:37

Site-specific
Recreator Equation Inputs for Soil

*** Inputted values different from Recreator defaults are highlighted.**

Variable	Recreator Soil Default Value	Form-input Value
AT_{rec} (averaging time)	365	365
BW_{0-2} (body weight) kg	15	15
BW_{2-6} (body weight) kg	15	15
BW_{6-16} (body weight) kg	80	80
BW_{16-30} (body weight) kg	80	80
BW_{rec-a} (body weight - adult) kg	80	80
BW_{rec-c} (body weight - child) kg	15	15
$DFS_{rec-adj}$ (age-adjusted soil dermal factor) mg/kg	.	103390
$DFSM_{rec-adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	.	428260
ED_{rec} (exposure duration - recreator) years	26	26
ED_{0-2} (exposure duration) year	2	2
ED_{2-6} (exposure duration) year	4	4
ED_{6-16} (exposure duration) year	10	10
ED_{16-30} (exposure duration) year	10	10
ED_{rec-c} (exposure duration - child) years	6	6
EF_{rec} (exposure frequency) days/year	.	350
EF_{0-2} (exposure frequency) days/year	.	350
EF_{2-6} (exposure frequency) days/year	.	350
EF_{6-16} (exposure frequency) days/year	.	350
EF_{16-30} (exposure frequency) days/year	.	350
EF_{rec-a} (exposure frequency - adult) days/year	.	350
EF_{rec-c} (exposure frequency - child) days/year	.	350
ET_{rec} (exposure time - recreator) hours/day	.	24
ET_{0-2} (exposure time) hours/day	.	24
ET_{2-6} (exposure time) hours/day	.	24
ET_{6-16} (exposure time) hours/day	.	24
ET_{16-30} (exposure time) hours/day	.	24
ET_{rec-a} (adult exposure time) hours/day	.	24
ET_{rec-c} (child exposure time) hours/day	.	24
THQ (target hazard quotient) unitless	0.1	0.1

Output generated 02MAY2019:13:12:37

Site-specific
Recreator Equation Inputs for Soil

*** Inputted values different from Recreator defaults are highlighted.**

Variable	Recreator Soil Default Value	Form-input Value
$IFS_{rec-adj}$ (age-adjusted soil ingestion factor) mg/kg	.	36750
$IFSM_{rec-adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	.	166833.333
IRS_{0-2} (soil intake rate) mg/day	200	200
IRS_{2-6} (soil intake rate) mg/day	200	200
IRS_{6-16} (soil intake rate) mg/day	100	100
IRS_{16-30} (soil intake rate) mg/day	100	100
IRS_{rec-a} (soil intake rate - adult) mg/day	100	100
IRS_{rec-c} (soil intake rate - child) mg/day	200	200
LT (lifetime - recreator) years	70	70
SA_{0-2} (skin surface area) cm^2/day	2373	2373
SA_{2-6} (skin surface area) cm^2/day	2373	2373
SA_{6-16} (skin surface area) cm^2/day	6032	6032
SA_{16-30} (skin surface area) cm^2/day	6032	6032
SA_{rec-a} (skin surface area - adult) cm^2/day	6032	6032
SA_{rec-c} (skin surface area - child) cm^2/day	2373	2373
TR (target risk) unitless	1.0E-06	1.0E-06
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Recreator Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	SF_o (mg/kg-day) $^{-1}$	SF_o Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)
Aldrin	309-00-2	No	Yes	1.70E+01	I	4.90E-03	I	3.00E-05	I	-		1	-	1	-	1.70E-02
Dieldrin	60-57-1	No	No	1.60E+01	I	4.60E-03	I	5.00E-05	I	-		1	0.1	1	-	1.95E-01

Chemical	K_{oc} \ (cm^3/g)	K_d \ (cm^3/g)	HLC ($atm\text{-}m^3/mole$)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia} \ (cm^2/s)
Aldrin	8.20E+04	4.92E+02	4.40E-05	1.80E-03	PHYSPROP	603.01	EPI	627.225	Approx. from Tcrit=1.5xTBoil	PEST	2.28E-02
Dieldrin	2.01E+04	-	1.00E-05	4.09E-04	PHYSPROP	603.15	PHYSPROP	904.725	Approx. from Tcrit=1.5xTBoil	PEST	2.33E-02

Chemical	D_{iw} \ (cm^2/s)	D_A \ (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)
Aldrin	5.84E-06	4.52E-09	1.36E+09	1.72E+06	4.09E-02	-	9.82E-01	3.93E-02	2.35E-01	-	-
Dieldrin	6.01E-06	-	1.36E+09	-	4.35E-02	1.54E-01	8.30E+02	3.39E-02	3.91E-01	1.65E+00	-

Chemical	Noncarcinogenic SL Child THI=0.1 (mg/kg)	Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	Inhalation SL Adult THQ=0.1 (mg/kg)	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
Aldrin	2.35E-01	2.50E+00	-	-	2.50E+00	3.93E-02 ca**
Dieldrin	3.16E-01	4.17E+00	9.88E+00	-	2.93E+00	3.39E-02 ca**

Site-specific
Recreator Risk for Soil

Chemical	SF_o (mg/kg-day) $^{-1}$	SF_o Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc}\ (cm^3/g)	K_d\ (cm^3/g)	HLC (atm-m^3/mole)	Henry's Law Constant Used in Calcs (unitless)
Aldrin	1.70E+01	I	4.90E-03	I	3.00E-05	I	-		1	-	1	-	1.70E-02	8.20E+04	4.92E+02	4.40E-05	1.80E-03
Dieldrin	1.60E+01	I	4.60E-03	I	5.00E-05	I	-		1	0.1	1	-	1.95E-01	2.01E+04	-	1.00E-05	4.09E-04
*Total Risk/HI	-		-		-		-		-	-	-	-	-	-	-	-	

Chemical	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia}\ (cm^2/s)	D_{iw}\ (cm^2/s)	D_A\ (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Concentration (mg/kg)
Aldrin	PHYSPROP	603.01	EPI	627.225	Approx. from Tcrit=1.5xTBoil	PEST	2.28E-02	5.84E-06	4.52E-09	1.36E+09	1.72E+06	6.30E-02
Dieldrin	PHYSPROP	603.15	PHYSPROP	904.725	Approx. from Tcrit=1.5xTBoil	PEST	2.33E-02	6.01E-06	-	1.36E+09	-	6.30E-02
*Total Risk/HI		-		-			-	-	-	-	-	-

Chemical	Ingestion Risk	Dermal Risk	Inhalation Risk	Carcinogenic Risk	Ingestion Child HQ	Dermal Child HQ	Inhalation Child HQ	Noncarcinogenic Child HI	Ingestion Adult HQ	Dermal Adult HQ	Inhalation Adult HQ	Noncarcinogenic Adult HI
Aldrin	1.54E-06	-	6.42E-08	1.60E-06	2.68E-02	-	-	2.68E-02	2.52E-03	-	-	2.52E-03
Dieldrin	1.45E-06	4.08E-07	7.59E-11	1.86E-06	1.61E-02	3.82E-03	-	1.99E-02	1.51E-03	6.38E-04	-	2.15E-03
*Total Risk/HI	*2.99E-06*	*4.08E-07*	*6.42E-08*	*3.46E-06*	*4.30E-02*	*3.82E-03*	-	*4.68E-02*	*4.03E-03*	*6.38E-04*	-	*4.67E-03*

Output generated 02MAY2019:13:12:37

APPENDIX P

Photographic Log

2018 Photographic Log

3d Inf Div (Mech)

PIKA ARCADIS A JOINT VENTURE

Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No. 1

Description
View looking south at Former FTA Location

Date: 02/20/08



Date: 07/13/18



Photo No. 2

Description
View looking west at Former FTA Location

Date: 02/20/08



Date: 07/13/18



2018 Photographic Log

Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No. 3

Description
View looking north toward DAACG Area

Date: 02/20/08





Photo No. 4

Description
View of northern ditch looking east

Date: 02/20/08





2018 Photographic Log

Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No.	Date
5	02/20/08

Description
Water that accumulated at upgradient end of northern ditch

Date: 02/20/08





Photo No.	Date
6	02/20/08

Description
View of DAACG Area from Lightning Road

Date: 02/20/08





2018 Photographic Log

Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No.	Date
7	02/20/08

Description
View of DAACG Area from Lightning Road

Date: 02/20/08

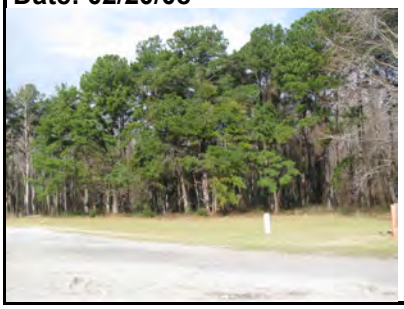




Photo No.	Date
8	02/20/08

Description
View of access road looking east

Date: 02/20/08





2018 Photographic Log

Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No.	
9	

Description
Former AST Area looking east

Date: 10/09/08



Date: 07/13/18



Photo No.	
10	

Description
Relative location of airfield east of FTA

Date: 10/09/08



Date: 07/13/18



Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No.	
11	

Description
Wooded Area north of access road

Date: 10/09/08





Photo No.	
12	

Description
View east across access road to Wooded Area

Date: 10/09/08





2018 Photographic Log

Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No. 13

Description
Wooded Area (DAACG Area)

Date: 10/09/08





Photo No. 14

Description
Wooded Area (DAACG Area)

Date: 10/09/08





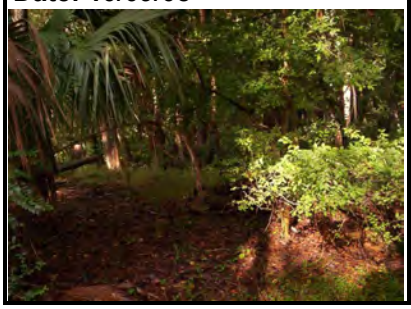
2018 Photographic Log

Client Name:	Site Location:	Project No.:
U.S. Army Environmental Command	HAA-01 Hunter Army Airfield, GA	10153001.0001

Photo No. 15

Description
Wooded Area (DAACG Area)

Date: 10/09/08





PHOTOGRAPH LOG – NORTHERN DITCH AND SOUTHERN DITCH

Supplemental Photographs (2014 and 2018)



Photograph: 1

Description: Northern ditch at culvert.

Location: HAA-01

Date: 12/8/2014



Photograph: 2

Description: Northern ditch.

Location: HAA-01

Date: 7/13/2018

PHOTOGRAPH LOG – NORTHERN DITCH AND SOUTHERN DITCH

Supplemental Photographs (2014 and 2018)



Photograph: 3

Description: Northern ditch.

Location: HAA-01

Date: 12/8/2014



Photograph: 4

Description Northern ditch.

Location: HAA-01

Date: 7/13/2018

Supplemental Photographs (2014 and 2018)



Photograph: 5

Description: Southern ditch.

Location: HAA-01

Date: 12/8/2014



Photograph: 6

Description: Southern ditch.

Location: HAA-01

Date: 7/13/2018

Supplemental Photographs (2014 and 2018)



Photograph: 7

Description: Southern ditch.

Location: HAA-01

Date: 7/13/2018



Photograph: 8

Description: Southern ditch.

Location: HAA-01

Date: 7/13/2018

Supplemental Photographs (2014 and 2018)



Photograph: 9

Description: 2018 aerial view of northern ditch and southern ditch.

Location: HAA-01

Date: 3/1/2018

APPENDIX Q

MNA Flushing Calculations

Appendix P. Monitored Natural Attenuation Flushing Calculations
HAA-01
Hunter Army Airfield, Georgia

DAACG Area - cis-1,2-DCE and VC in Groundwater

Aquifer and COC Parameters	Unit	Values	
Total Porosity (θ_t)	--	0.3	assumed value
Mobile Porosity (θ_m)	--	0.1	assumed value
Bulk Density (ρ_b)	g/cc	1.85	assumed value
Fraction Organic Carbon	--	0.001	assumed value
Hydraulic Conductivity (k)	ft/day	1.8	
Hydraulic Gradient (i)		0.0170	
Groundwater Velocity (V_{GW})	ft/day	0.31	

Contaminant Parameters		cis-1,2-DCE	VC	Notes
Log Koc	--	1.62	0.39	look up values
Kd	--	0.04	0.00	Kd=Koc*foc
Retardation Factor (R)	--	1.26	1.02	$R = 1 + \rho_b * Kd / \theta_t$
Contaminant Velocity (V_c)	ft/day	0.24	0.30	$V_c=V_{GW}/R$
Maximum Contaminant Concentration (C_{max})[1]	ppb	2300	120	cis-1,2-DCE - concentration from HMW-21 VC - concentration from COE-MW-03
Cleanup Goal (C_{goal})	ppb	70	2	chemical specific ARARs
# of pore flushes to achieve cleanup	--	4.4	4.2	
Distance for clean water pore flushing	ft	121	61	cis-1,2-DCE - distance from HMW-21 to HA01-MW-12 VC - distance from COE-MW-03 to COE-MW-02
Groundwater Travel Time between wells	Year	1.1	0.5	
Years to Cleanup	Year	4.8	2.3	based on GW velocity

Note: This table provides a remedial timeframe calculation for groundwater at HAA-01. The drivers for the remedial timeframe are the highest cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC) concentrations in plume wells.
NA - Not Applicable

[1] The highest concentration from monitoring wells in the shallow zone area were used in the calculation.

Appendix P. Monitored Natural Attenuation Flushing Calculations
HAA-01
Hunter Army Airfield, Georgia

Former FTA - Benzene in Groundwater

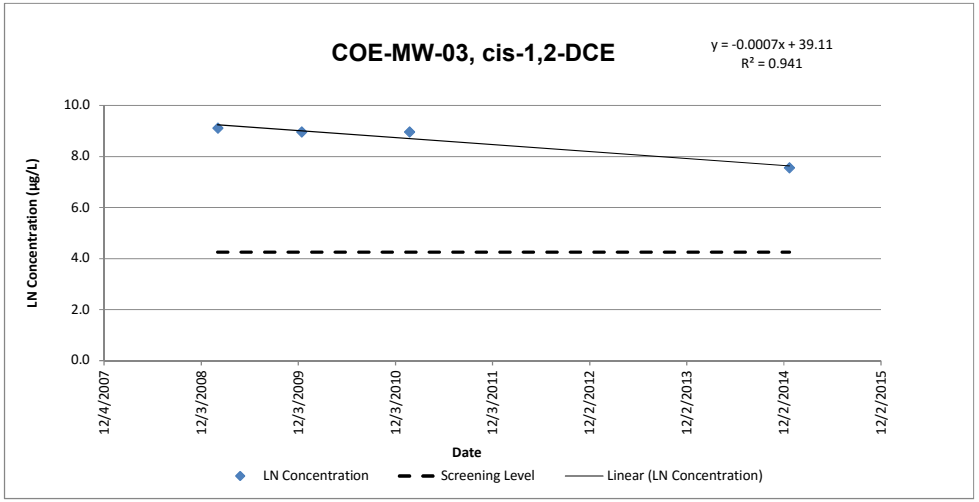
Aquifer and COC Parameters	Unit	Values	
Total Porosity (θ_t)	--	0.3	assumed value
Mobile Porosity (θ_m)	--	0.1	assumed value
Bulk Density (ρ_b)	g/cc	1.85	assumed value
Fraction Organic Carbon	--	0.001	assumed value
Hydraulic Conductivity (k)	ft/day	1.8	
Hydraulic Gradient (i)		0.0420	
Groundwater Velocity (V_{GW})	ft/day	0.76	

Contaminant Parameters		Benzene (a)	Benzene (b)	Notes
Log Koc	--	1.92	1.92	look up values
Kd	--	0.08	0.08	Kd=Koc*foc
Retardation Factor (R)	--	1.51	1.51	$R = 1 + \rho_b * Kd / \theta_t$
Contaminant Velocity (V_c)	ft/day	0.50	0.50	$V_c=V_{GW}/R$
Maximum Contaminant Concentration (C_{max})[1]	ppb	30	19	Benzene (a) - concentration from HMW-13 Benzene (b) - concentration from HMW-10
Cleanup Goal (C_{goal})	ppb	5	5	chemical specific ARARs
# of pore flushes to achieve cleanup	--	2.7	2.0	
Distance for clean water pore flushing	ft	112	98	Benzene (a) - distance from HMW-13 to HA01-MW-15 Benzene (b) - distance from HMW-10 to HA01-MW-17
Groundwater Travel Time between wells	Year	0.4	0.4	
Years to Cleanup	Year	1.1	0.7	based on GW velocity

Note: This table provides a remedial timeframe calculation for groundwater at HAA-01. The drivers for the remedial timeframe are the highest benzene concentrations in plume wells.
NA - Not Applicable
[1] The highest concentration from monitoring wells in the shallow zone area were used in the calculation.

Sample Information
Sample Location **COE-MW-03**
Constituent cis-1,2-DCE

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
2/3/2009	9000	9.10
12/16/2009	7800	8.96
1/25/2011	7800	8.96
12/23/2014	1900	7.55



Notes:

Data quality	
Total # of data points used in regression	4
# of nondetects	0
% of data as detects	100

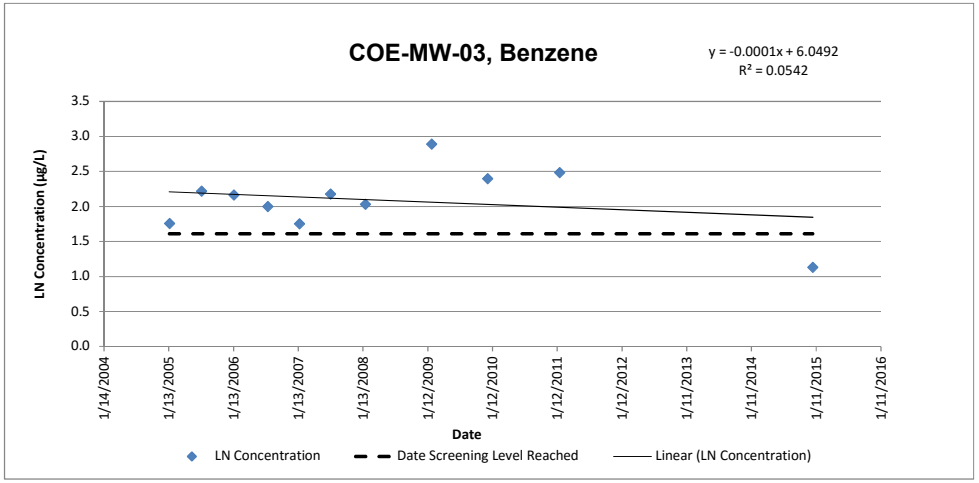
Results		
Coefficient of Determination (R^2) =	0.9410	
p-Value =	2.99E-02	
Attenuation Rate in Groundwater (K) =	0.0007	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	0.0004	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	9.25E+02	days

Date Screening Level Reached	
Screening Level	70
LN Screening Level	4.2
Intercept	39.110
Slope	-0.0007
Date to Screening Level	2027

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm
Cis-1,2-DCE = cis-1,2-dichloroethene

Sample Information
Sample Location **COE-MW-03**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
1/16/2005	5.8	1.76
7/17/2005	9.2	2.22
1/15/2006	8.7	2.16
7/24/2006	7.39	2.00
1/20/2007	5.77	1.75
7/14/2007	8.8	2.17
1/25/2008	7.6	2.03
2/3/2009	18	2.89
12/16/2009	11	2.40
1/25/2011	12	2.48
12/23/2014	3.1	1.13



Notes:
Estimated value

Data quality	
Total # of data points used in regression	11
# of nondetects	0
% of data as detects	100

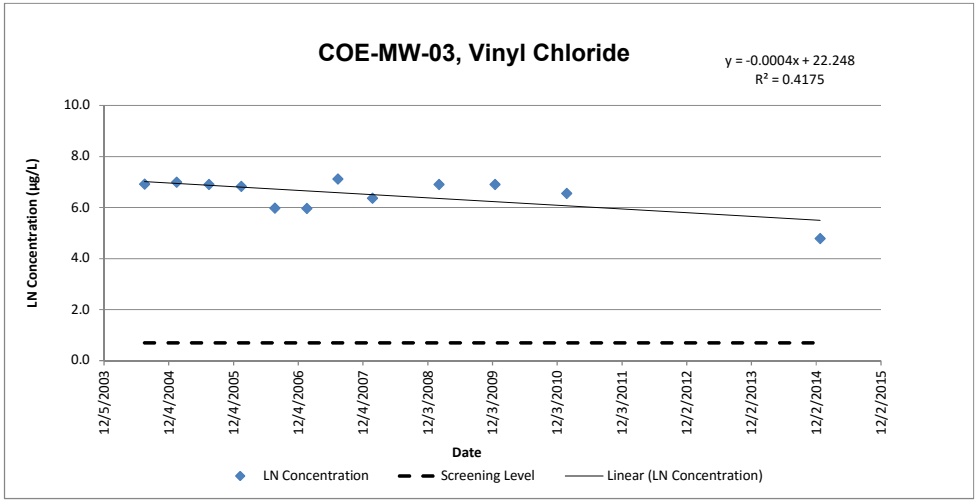
Results		
Coefficient of Determination (R^2) =	0.0542	
p-Value =	4.91E-01	
Attenuation Rate in Groundwater (K) =	0.0001	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0002	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	5
LN Screening Level	1.61
Intercept	6.049
Slope	-0.0001
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **COE-MW-03**
Constituent Vinyl Chloride

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
7/20/2004	1010	6.92
1/16/2005	1090	6.99
7/17/2005	1000	6.91
1/15/2006	921	6.83
7/24/2006	392	5.97
1/20/2007	388	5.96
7/14/2007	1230	7.11
1/25/2008	578	6.36
2/3/2009	1000	6.91
12/16/2009	1000	6.91
1/25/2011	700	6.55
12/23/2014	120	4.79



Notes:
J = Estimated value

Data quality	
Total # of data points used in regression	12
# of nondetects	0
% of data as detects	100

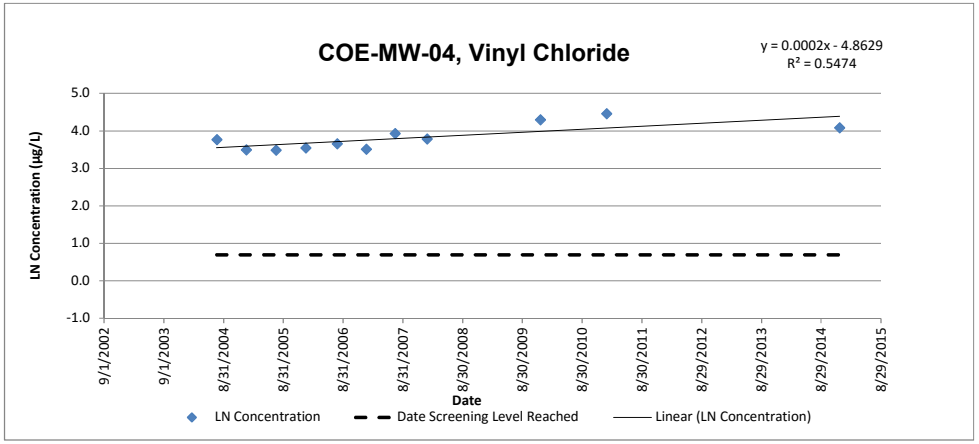
Results		
Coefficient of Determination (R^2) =	0.4175	
p-Value =	2.32E-02	
Attenuation Rate in Groundwater (K) =	0.0004	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	0.0001	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	1.74E+03	days

Date Screening Level Reached	
Screening Level	2
LN Screening Level	0.7
Intercept	22.248
Slope	-0.0004
Date to Screening Level	2047

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **COE-MW-04**
Constituent Vinyl Chloride

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
7/20/2004	43.1	3.76
1/16/2005	32.9	3.49
7/17/2005	32.6	3.48
1/16/2006	34.6	3.54
7/25/2006	38.6	3.65
1/20/2007	33.4	3.51
7/14/2007	50.9	3.93
1/25/2008	44	3.78
12/17/2009	73	4.29
1/26/2011	86	4.45
12/19/2014	59	4.08



Notes:

Data quality	
Total # of data points used in regression	11
# of nondetects	0
% of data as detects	100

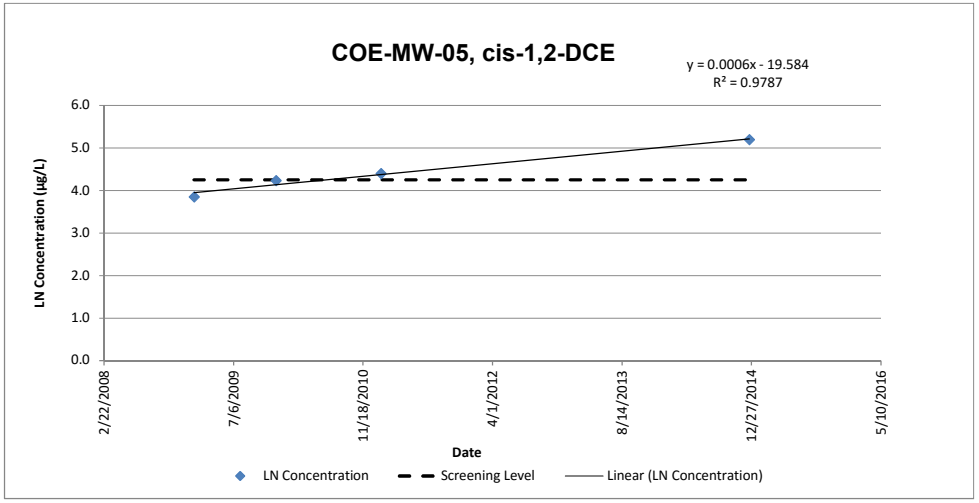
Results		
Coefficient of Determination (R^2) =	0.5474	
p-Value =	9.24E-03	
Attenuation Rate in Groundwater (K) =	-0.0002	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0003	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	2
LN Screening Level	0.7
Intercept	-4.863
Slope	0.0002
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **COE-MW-05**
Constituent cis-1,2-DCE

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
2/4/2009	47	3.85
12/17/2009	69	4.23
1/26/2011	81	4.39
12/19/2014	180	5.19



Notes:
ND taken at reporting limit/reported value

Data quality	
Total # of data points used in regression	4
# of nondetects	0
% of data as detects	100

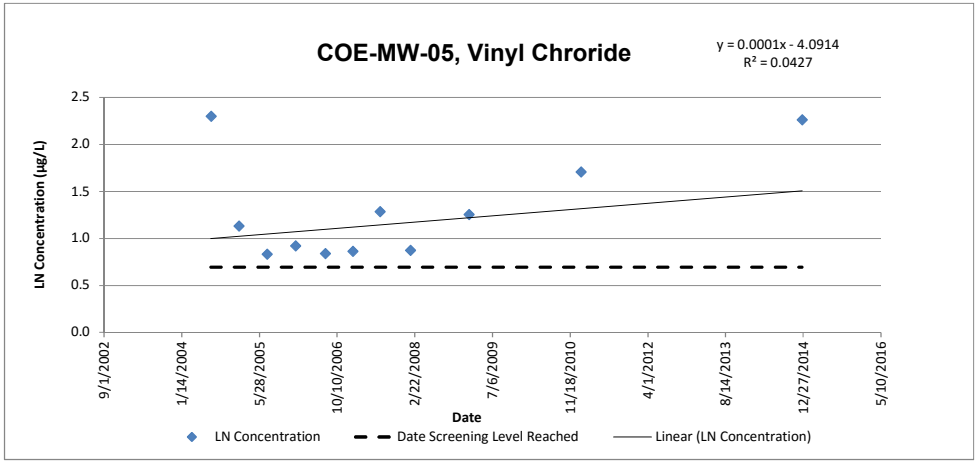
Results		
Coefficient of Determination (R^2) =	0.9787	
p-Value =	1.07E-02	
Attenuation Rate in Groundwater (K) =	-0.0006	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0008	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	70
LN Screening Level	4.2
Intercept	-19.584
Slope	0.0006
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm
cis-1,2-DCE = cis-1,2-dichloroethene

Sample Information
Sample Location **COE-MW-05**
Constituent Vinyl Chroride

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
7/20/2004	2.6	2.30
1/16/2005	3.1	1.13
7/17/2005	2.3	0.83
1/16/2006	2.51	0.92
7/25/2006	2.31	0.84
1/20/2007	2.37	0.86
7/14/2007	3.61	1.28
1/25/2008	2.39	0.87
2/4/2009	3.5	1.25
12/17/2009	0.75	-0.29
1/26/2011	5.5	1.70
12/19/2014	9.6	2.26



Notes:

Data quality	
Total # of data points used in regression	12
# of nondetects	0
% of data as detects	100

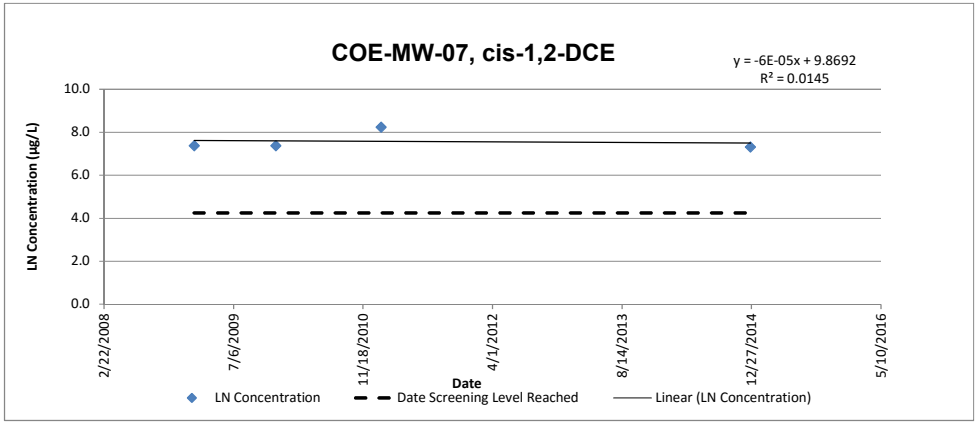
Results		
Coefficient of Determination (R^2) =	0.0427	
p-Value =	5.20E-01	
Attenuation Rate in Groundwater (K) =	-0.0001	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0005	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	2
LN Screening Level	0.7
Intercept	-4.091
Slope	0.0001
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **COE-MW-07**
Constituent cis-1,2-DCE

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
2/4/2009	1600	7.38
12/16/2009	1600	7.38
1/26/2011	3800	8.24
12/23/2014	1500	7.31



Notes:

Data quality	
Total # of data points used in regression	4
# of nondetects	0
% of data as detects	100

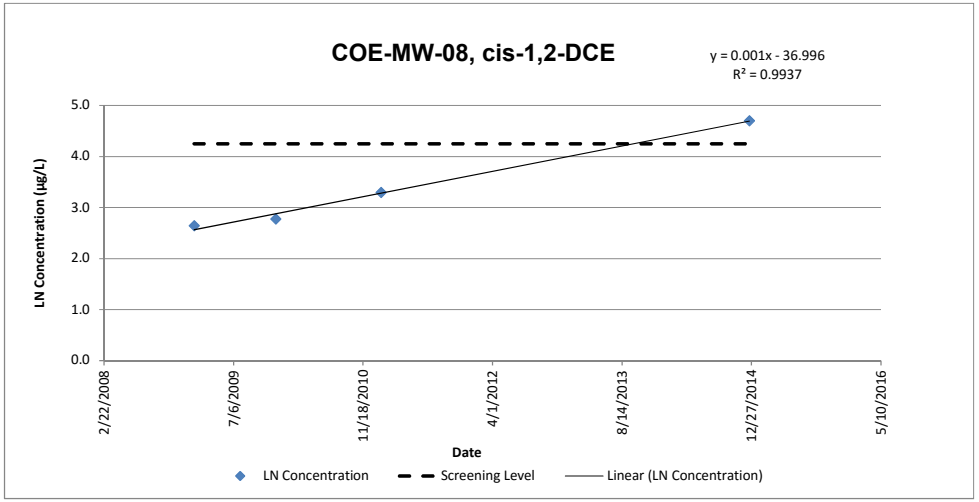
Results		
Coefficient of Determination (R^2) =	0.0145	
p-Value =	8.80E-01	
Attenuation Rate in Groundwater (K) =	0.0001	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0009	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	70
LN Screening Level	4.2
Intercept	9.869
Slope	-0.0001
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm
cis-1,2-DCE = cis-1,2-dichloroethene

Sample Information
Sample Location **COE-MW-08**
Constituent cis-1,2-DCE

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
2/4/2009	14	2.64
12/16/2009	16	2.77
1/26/2011	27	3.30
12/19/2014	110	4.70



Notes:

Data quality	
Total # of data points used in regression	4
# of nondetects	0
% of data as detects	100

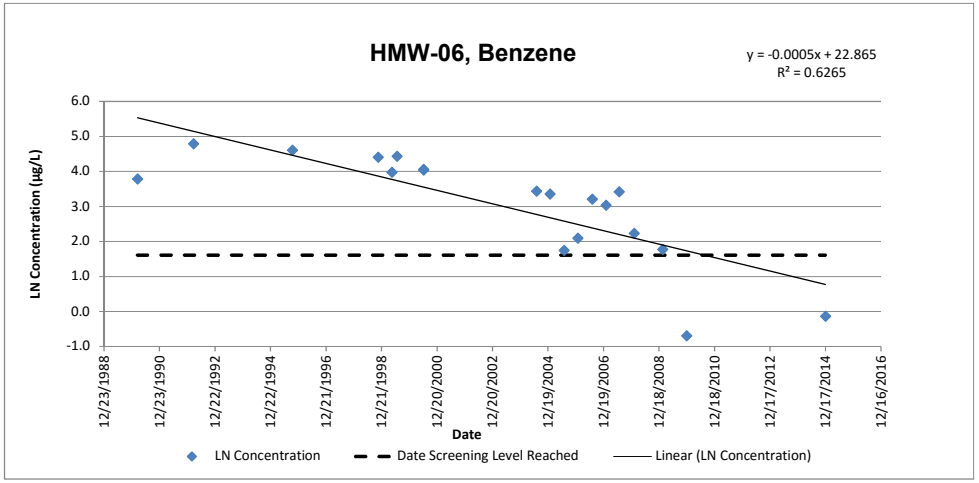
Results		
Coefficient of Determination (R^2) =	0.9937	
p-Value =	3.15E-03	
Attenuation Rate in Groundwater (K) =	-0.0010	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0012	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	70
LN Screening Level	4.2
Intercept	-36.996
Slope	0.0010
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm
cis-1,2-DCE = cis-1,2-dichloroethene

Sample Information
Sample Location **HMW-06**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
3/8/1990	44	3.78
3/12/1992	120	4.79
10/6/1995	100	4.61
11/5/1998	82	4.41
5/6/1999	53	3.97
7/12/1999	84.2	4.43
6/24/2000	56.8	4.04
6/24/2000	57.8	4.06
7/19/2004	31	3.43
1/15/2005	28.7	3.36
7/17/2005	5.7	1.74
1/14/2006	8.1	2.09
7/25/2006	24.8	3.21
1/20/2007	20.7	3.03
7/11/2007	30.4	3.41
1/24/2008	9.25	2.22
2/3/2009	5.9	1.77
12/17/2009	0.5	-0.69
12/16/2014	0.87	-0.14



Notes:
ND taken at reporting limit/reported value
Estimated value

Data quality	
Total # of data points used in regression	19
# of nondetects	0
% of data as detects	100

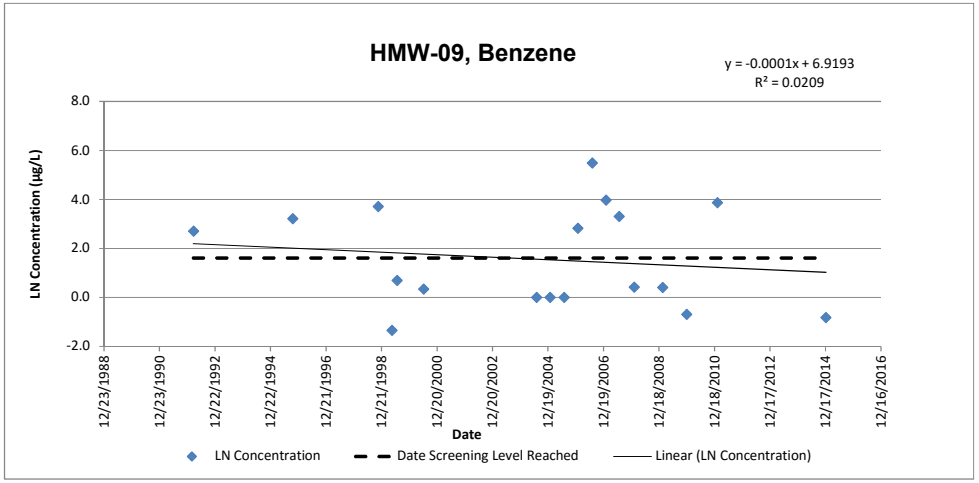
Results		
Coefficient of Determination (R^2) =	0.6265	
p-Value =	5.41E-05	
Attenuation Rate in Groundwater (K) =	0.0005	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	0.0004	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	1.32E+03	days

Date Screening Level Reached	
Screening Level	5
LN Screening Level	1.61
Intercept	22.865
Slope	-0.0005
Date to Screening Level	2010

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **HMW-09**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
3/12/1992	15	2.71
10/8/1995	25	3.22
11/5/1998	41	3.71
5/6/1999	0.26	-1.35
7/12/1999	2	0.69
6/24/2000	1.4	0.34
7/19/2004	1	0.00
1/15/2005	1	0.00
7/17/2005	1	0.00
1/14/2006	16.8	2.82
7/24/2006	242	5.49
1/21/2007	53.2	3.97
7/12/2007	27.1	3.30
1/24/2008	1.52	0.42
2/3/2009	1.5	0.41
12/16/2009	0.5	-0.69
1/25/2011	48	3.87
12/23/2014	0.44	-0.82



Notes:
ND taken at reporting limit/reported value
Estimated value

Data quality	
Total # of data points used in regression	18
# of nondetects	6
% of data as detects	67

Less than 75% data above reporting limits.

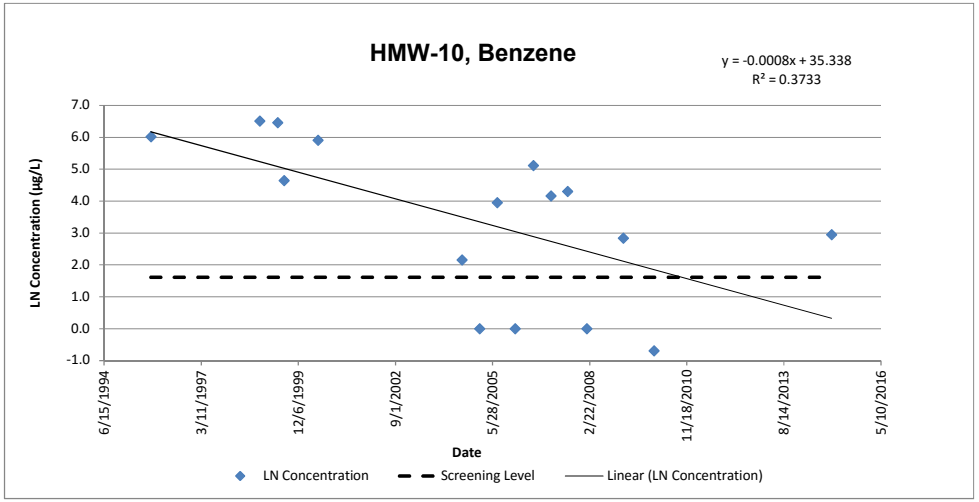
Results		
Coefficient of Determination (R^2) =	0.0109	
p-Value =	6.80E-01	
Attenuation Rate in Groundwater (K) =	0.0001	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0003	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	5
LN Screening Level	1.61
Intercept	5.385
Slope	-0.0001
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **HMW-10**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
10/9/1995	410	6.02
11/5/1998	670	6.51
5/6/1999	640	6.46
7/12/1999	104	4.64
6/24/2000	368	5.91
7/19/2004	8.6	2.15
1/15/2005	1	0.00
7/16/2005	51.7	3.95
1/14/2006	1	0.00
7/23/2006	167	5.12
1/21/2007	64.1	4.16
7/11/2007	73.6	4.30
1/23/2008	1	0.00
2/3/2009	17	2.83
12/17/2009	0.5	-0.69
12/17/2014	19	2.94



Notes:
ND taken at reporting limit/reported value

Data quality	
Total # of data points used in regression	16
# of nondetects	6
% of data as detects	63

Less than 75% data above reporting limits.

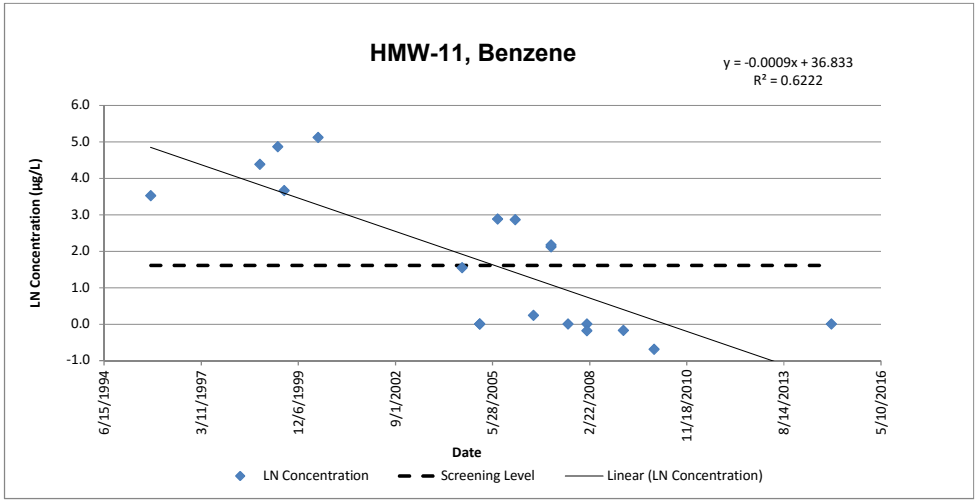
Results		
Coefficient of Determination (R^2) =	0.3733	
p-Value =	1.19E-02	
Attenuation Rate in Groundwater (K) =	0.0008	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	0.0003	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	8.31E+02	days

Date Screening Level Reached	
Screening Level	5
LN Screening Level	1.61
Intercept	35.338
Slope	-0.0008
Date to Screening Level	2010

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **HMW-11**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
10/8/1995	34	3.53
11/5/1998	80	4.38
5/6/1999	130	4.87
7/12/1999	39	3.66
6/24/2000	167	5.12
7/19/2004	4.7	1.55
1/15/2005	1	0.00
1/15/2005	1	0.00
7/17/2005	17.9	2.88
1/14/2006	17.5	2.86
7/23/2006	1.27	0.24
1/20/2007	8.3	2.12
1/20/2007	8.8	2.17
7/12/2007	1	0.00
1/24/2008	1	0.00
1/24/2008	0.832	-0.18
2/3/2009	0.84	-0.17
12/16/2009	0.5	-0.69
12/16/2014	1	0.00



Notes:
ND taken at reporting limit/reported value
Estimated value

Data quality	
Total # of data points used in regression	19
# of nondetects	6
% of data as detects	68

Less than 75% data above reporting limits.

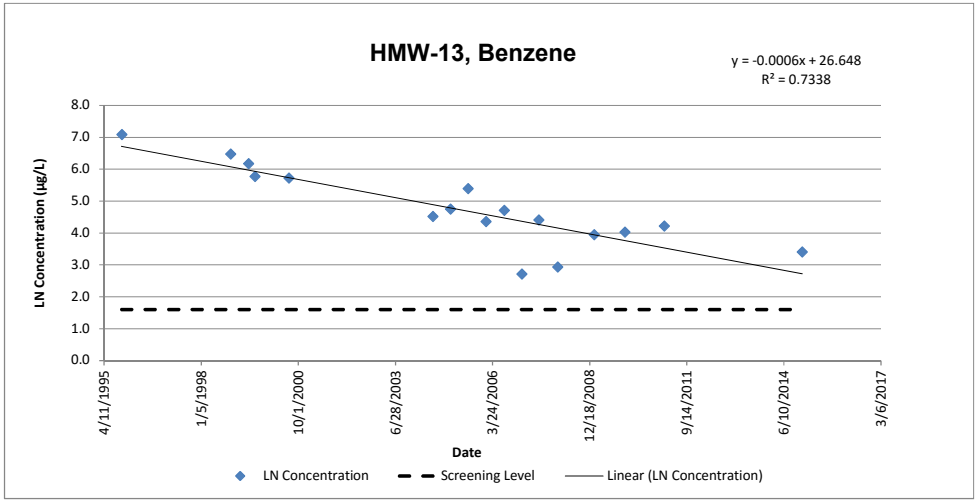
Results		
Coefficient of Determination (R^2) =	0.3180	
p-Value =	1.19E-02	
Attenuation Rate in Groundwater (K) =	0.0008	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	0.0003	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	9.14E+02	days

Date Screening Level Reached	
Screening Level	5
LN Screening Level	1.61
Intercept	32.457
Slope	-0.0008
Date to Screening Level	2011

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **HMW-13**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
10/9/1995	1200	7.09
11/5/1998	650	6.48
5/6/1999	480	6.17
7/12/1999	322	5.77
6/24/2000	306	5.72
7/19/2004	91.3	4.51
1/15/2005	116	4.75
7/16/2005	219	5.39
1/14/2006	78.3	4.36
7/24/2006	111	4.71
1/21/2007	15.1	2.71
7/12/2007	82.1	4.41
1/25/2008	18.7	2.93
2/2/2009	52	3.95
12/17/2009	56	4.03
1/25/2011	68	4.22
12/16/2014	30	3.40



Notes:
ND taken at reporting limit/reported value

Data quality	
Total # of data points used in regression	17
# of nondetects	0
% of data as detects	100

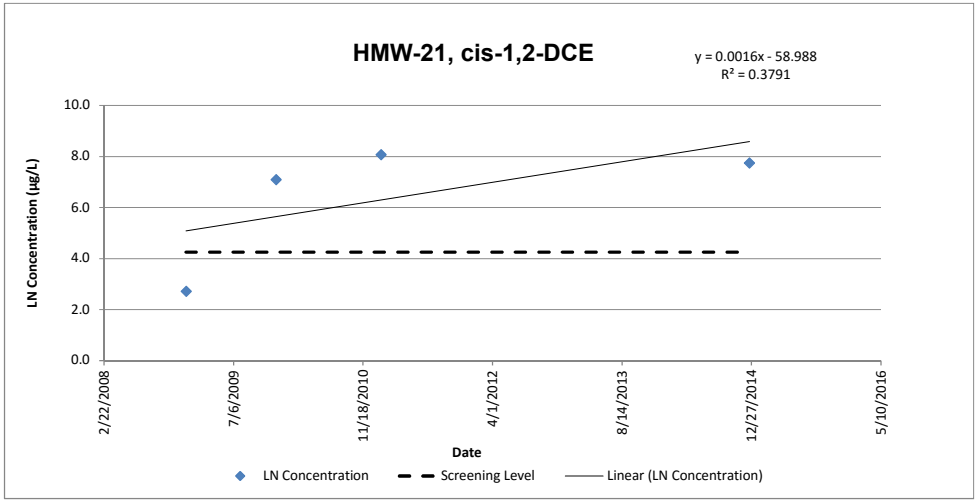
Results		
Coefficient of Determination (R^2) =	0.7338	
p-Value =	1.13E-05	
Attenuation Rate in Groundwater (K) =	0.0006	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	0.0004	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	1.22E+03	days

Date Screening Level Reached	
Screening Level	5.0
LN Screening Level	1.6
Intercept	26.648
Slope	-0.0006
Date to Screening Level	4/23/2020

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **HMW-21**
Constituent cis-1,2-DCE

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
1/4/2009	15	2.71
12/17/2009	1200	7.09
1/26/2011	3200	8.07
12/19/2014	2300	7.74



Notes:

Data quality	
Total # of data points used in regression	4
# of nondetects	0
% of data as detects	100

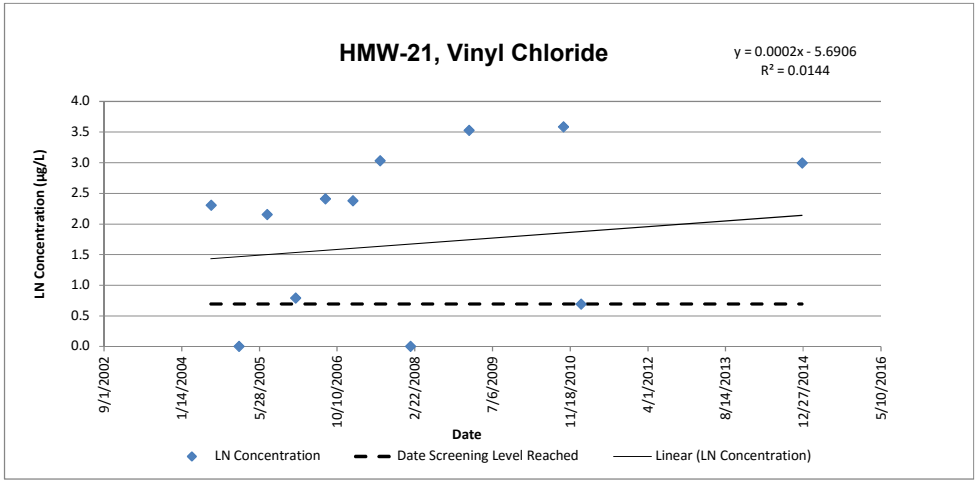
Results		
Coefficient of Determination (R^2) =	0.3791	
p-Value =	3.84E-01	
Attenuation Rate in Groundwater (K) =	-0.0016	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0059	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	70
LN Screening Level	4.2
Intercept	-58.988
Slope	0.0016
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm
cis-1,2-DCE = cis-1,2-dichloroethene

Sample Information
Sample Location **HMW-21**
Constituent Vinyl Chloride

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
7/20/2004	10	2.30
1/16/2005	1	0.00
7/17/2005	8.6	2.15
1/15/2006	2.2	0.79
7/25/2006	11.1	2.41
1/20/2007	10.8	2.38
7/14/2007	20.7	3.03
1/25/2008	1	0.00
2/4/2009	34	3.53
12/17/2009	0.13	-2.04
1/26/2011	2	0.69
10/5/2010	36	3.58
12/19/2014	20	3.00



Notes:
ND taken at reporting limit/reported value

Data quality	
Total # of data points used in regression	13
# of nondetects	0
% of data as detects	100

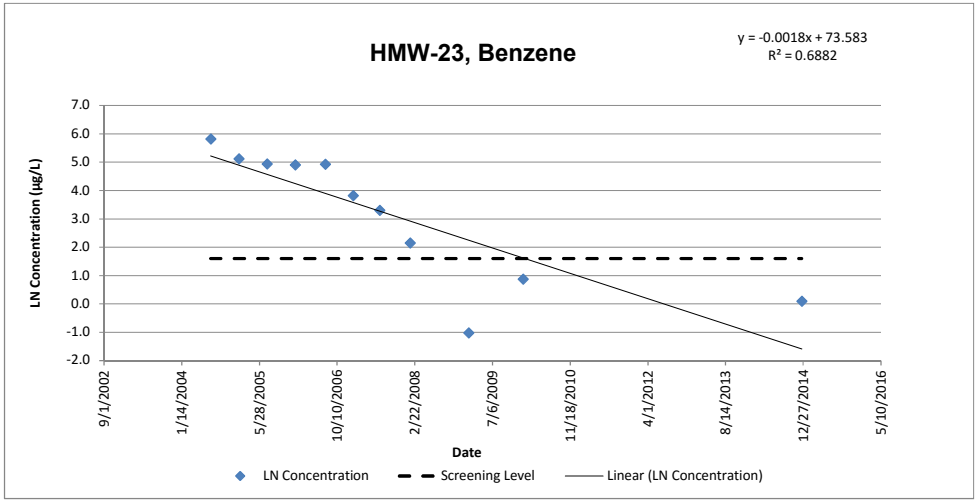
Results		
Coefficient of Determination (R^2) =	0.0144	
p-Value =	6.96E-01	
Attenuation Rate in Groundwater (K) =	-0.0002	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0010	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	NA	days

Date Screening Level Reached	
Screening Level	2
LN Screening Level	0.7
Intercept	-5.691
Slope	0.0002
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **HMW-23**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
7/19/2004	336	5.82
1/15/2005	166	5.11
7/17/2005	139	4.93
1/14/2006	134	4.90
7/25/2006	137	4.92
1/21/2007	45.2	3.81
7/12/2007	26.9	3.29
1/23/2008	8.52	2.14
2/3/2009	0.36	-1.02
1/18/2010	2.4	0.88
12/17/2014	1.1	0.10



Notes:
Estimated value

Data quality	
Total # of data points used in regression	11
# of nondetects	0
% of data as detects	100

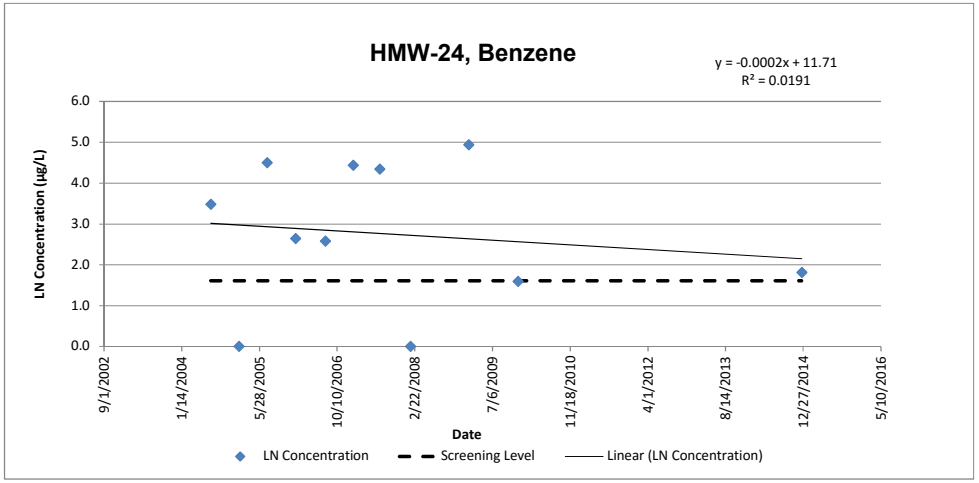
Results		
Coefficient of Determination (R^2) =	0.6882	
p-Value =	1.58E-03	
Attenuation Rate in Groundwater (K) =	0.0018	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	0.0011	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	3.87E+02	days

Date Screening Level Reached	
Screening Level	5.0
LN Screening Level	1.6
Intercept	73.583
Slope	-0.0018
Date to Screening Level	1/24/2010

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

Sample Information
Sample Location **HMW-24**
Constituent Benzene

Data		
Sample Date	Concentration	LN Concentration
	(ug/L)	
7/19/2004	32.5	3.48
1/15/2005	1	0.00
7/17/2005	89.8	4.50
1/15/2006	14	2.64
7/25/2006	13.2	2.58
1/21/2007	84.5	4.44
7/12/2007	77	4.34
1/24/2008	1	0.00
2/3/2009	140	4.94
12/17/2009	4.9	1.59
12/17/2014	6.1	1.81



Notes:
ND taken at reporting limit/reported value

Data quality	
Total # of data points used in regression	11
# of nondetects	2
% of data as detects	82

Results		
Coefficient of Determination (R^2) =	0.0191	
p-Value =	6.85E-01	
Attenuation Rate in Groundwater (K) =	0.0002	$days^{-1}$
Attenuation Rate in Groundwater at 90% confidence (K) =	-0.0008	$days^{-1}$
Chemical Half Life in Groundwater ($t_{1/2}$) =	3.04E+03	days

Date Screening Level Reached	
Screening Level	5
LN Screening Level	1.6
Intercept	11.710
Slope	-0.0002
Date to Screening Level	NA

Abbreviations and Notes
ug/l = micrograms per liter
LN = Natural Logarithm

APPENDIX R

Feasibility Study Cost Estimates

Constituents of Concern in Groundwater

Remedial Alternative 2 for the Former FTA – Monitoring and Institutional Controls

- Institutional Controls
  - Potable well ban
  - Periodic review of site use and paved area maintenance
- Monitoring
  - Monitor 5 wells for plume tracking purposes
  - Assume 30 years for costing based on USEPA 1988 which may not reflect actual time to clean up
    - Semi-annual sampling for 5 years
    - Annual sampling for 25 years
  - Analyze for VOCs, field parameters, and groundwater elevations

Remedial Alternative 3 for the DAACG Area – ERD, MNA, and Institutional Controls

- Institutional Controls
    - Potable well ban
    - Periodic review of site use and paved area maintenance
- ERD injection
    - Well network installed in DAACG area.
    - Install 11 injection wells with screen depths between 5 and 20 feet below ground surface (ft BGS).
    - Injections wells located on 35’ centers based on target 10 ft ROI for injected solution.
    - 2” diameter wells with flush mount well vaults.
    - Assume injection rate of 0.5 gpm per well via gravity feed.
    - Injection of 4,500 gallons of 2% EVO per event.
    - Performance monitoring includes quarterly sampling of 4 wells for TOC; semi-annual monitoring of 5 wells for VOCs and 4 wells for VOCs, light gases (methane, ethane, and ethene), and TOC, and annual sampling of 18 additional wells for VOCs.
    - Two injection events assumed for effective treatment, with 2-year duration between events.
- Monitored Natural Attenuation
    - Monitor performance monitoring wells for MNA purposes following completion of ERD injections
    - Analyze for VOCs, light gases and field parameters
    - Assume 30 years for costing based on USEPA 1988 and may not reflect actual time to clean up
        - Semi-annual sampling for 5 years
        - Annual sampling for 25 years

Remedial Alternative 4 for the DAACG Area – ISCO, Monitored Natural Attenuation, and Institutional Controls

- Institutional Controls
    - Potable well ban
    - Periodic review of site use and paved area maintenance
- ISCO injection
    - Well network installed in DAACG area.
    - Install 11 injection wells with screen depths between 5 and 20 ft BGS.
    - Injections wells located on 35’ centers based on target 10 ft ROI for injected solution.
    - 2” diameter wells with flush mount well vaults.
    - Assume injection rate of 0.5 gpm per well via gravity feed.
    - Injection of 4,500 gallons of 60 g/L sodium persulfate and 40 g/L sodium hydroxide solution per well per event
    - Performance monitoring includes:
        - Quarterly sampling of 4 wells for sulfate, field parameters, persulfate (field kit), and sulfide (field kit);
        - Semi-annual monitoring of 5 wells for VOCs and 4 wells for VOCs, light gases (methane, ethane, and ethene), sulfate, field parameters, persulfate (field kit), and sulfide (field kit); and
        - Annual sampling of 18 additional wells for VOCs.
    - Two injection events assumed for effective treatment, with 2-year duration between events.
- Monitored Natural Attenuation
    - Monitor performance monitoring wells for MNA purposes following completion of ISCO injections
    - Analyze for VOCs, light gases and field parameters
    - Assume 30 years for costing based on USEPA 1988 and may not reflect actual time to clean up
        - Semi-annual sampling for 5 years
        - Annual sampling for 25 years

Benzo(a)pyrene in Soil

Remedial Alternative 2 – Vegetative Cover

- Institutional Controls
    - Residential use ban
    - Periodic review of site use and paved area maintenance
- Vegetative Cover
    - Existing cover at former FTA includes a grassy meadow with areas of mature hardwood and evergreen forest to the west and south

Remedial Alternative 3 – Excavation and Disposal

- Excavation
    - Excavate 33,000 square foot area to 2 ft BGS, for a total estimated volume of 66,000 cubic feet (2,400 cubic yards)
    - Set up temporary containment area for storing excavated material
    - Composite sampling of excavated waste for developing waste profile
    - Post-excavation confirmation sampling for benzo(a)pyrene (via EPA 8270)
    - Backfill to grade with certified clean fill
    - Restore surface with new grass vegetative cover for erosion control
- Dispose of 2,400 cubic yards of non-hazardous excavation material to approved offsite disposal facility

Appendix Q - Feasibility Study Cost Estimates

Site: **HAA-01**
Location: **Hunter AAF, Georgia**
Phase: **RI/FS**
Base Year: **2017**

Groundwater Remedial Alternatives	**Total Cost**	**Present Worth Total Cost**	**Capital Cost**	**Total Annual O&M and Periodic Costs**	**Present Worth of Total Annual O&M and Periodic Costs**	***Estimated Timeframe of Alternative*** [1]	***Basis for Estimated Term of Alternative***
Alternative 2 for the Former FTA - Monitoring and Institutional Controls	$ 648,813	$ 320,616	$ 30,000	$ 618,813	$ 290,616	*30*	*USEPA 1988*
Alternative 3 for the DAACG Area - ERD, MNA, and Institutional Controls	$ 1,176,160	$ 702,242	$ 158,727	$ 1,017,433	$ 543,515	*30*	*USEPA 1988*
Alternative 4 for the DAACG Area - ISCO, MNA, and Institutional Controls	$ 1,247,633	$ 771,510	$ 183,431	$ 1,064,203	$ 588,079	*30*	*USEPA 1988*
Soil Remedial Alternatives	**Total Cost**	**Present Worth Total Cost**	**Capital Cost**	**Total Annual O&M and Periodic Costs**	**Present Worth of Total Annual O&M and Periodic Costs**	***Estimated Timeframe of Alternative*** [1]	***Basis for Estimated Term of Alternative***
Alternative 2 - Vegetative Cover	$ 51,681	$ 40,193	$ 13,438	$ 38,244	$ 26,755	*10*	*USEPA 1988*
Alternative 3 - Excavation and Disposal	$ 964,561	$ 956,812	$ 880,044	$ 84,517	$ 76,768	*5*	*USEPA 1988*

Notes and References:

1: The estimated timeframe of each alternative assumed for costing may not reflect the actual time to cleanup.

United States Environmental Protection Agency. 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA Interim Final. USEPA Office of Emergency and Remedial Response. October 1988.

PIKA-Arcadis U.S., Inc.

801 Corporate Center Drive

Suite 300

Raleigh, NC 27526

Tel 919.854.1282

Fax 919.854.5448

arcadis.com