City of Morro Bay and
Cayucos Sanitary District

OFFSHORE MONITORING AND REPORTING PROGRAM

RESIDUAL BIOSOLIDS CHEMICAL ANALYSIS RESULTS

AUGUST 2013

Marine Research Specialists

3140 Telegraph Rd., Suite A
Ventura, California 93003

Report to

City of Morro Bay and
Cayucos Sanitary District

955 Shasta Avenue
Morro Bay, California 93442
(805) 772-6272

MONITORING AND REPORTING PROGRAM

ANNUAL BIOSOLIDS REPORT

CHEMICAL ANALYSIS RESULTS

AUGUST 2013

Prepared by

Bonnie Luke
Douglas A. Coats

Marine Research Specialists

3140 Telegraph Rd., Suite A
Ventura, California 93003

Telephone: (805) 644-1180
Telefax: (805) 289-3935
E-mail: Marine@Rain.org

September 2013

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Bruce Keogh

Mr. Bruce Keogh
Wastewater Division Manager
City of Morro Bay

Date September 16, 2013

marine research specialists
3140 Telegraph Rd., Suite A • Ventura, CA 93003 • 805-644-1180

Bruce Keogh
Wastewater Division Manager
City of Morro Bay
955 Shasta Avenue
Morro Bay, CA 93442

16 September 2013

Reference: Chemical Analysis Results for Biosolid Samples Collected in August 2013

Dear Mr. Keogh:

Enclosed are the results of chemical analyses conducted on a representative composite of biosolid samples collected from the drying beds on 21 August 2013. Also included in this report are pertinent QA/QC data, including chains of custody and analyses of method blanks and spikes. All analyses were conducted following the requirements set forth in Order Number R3-2008-0065 of NPDES discharge Permit Number CA0047881.

Based on a comparison between measured chemical concentrations in the composite sample and applicable State and Federal regulations, the biosolids amassed in 2013 are not considered hazardous waste, and are considered suitable for land application. A summary of the analytical results is presented in Table 1. As in prior years, only a few of the more than 150 compounds analyzed in the composite sample were detected at quantifiable concentrations, and all detected chemicals had concentrations well below the applicable standards. Bulk trace-metal concentrations measured in the August-2013 sample were comparable to concentrations measured in samples collected annually from 1999 through 2012.[a]

All trace-metal concentrations measured in the August-2013 sample were below Total Threshold Limit Concentrations (TTLC) that would designate them as hazardous under federal regulations.[b] Similarly, dry-weight concentrations for all the metals were well below the federally mandated limits, including the monthly limits for biosolids suitable for land application. One metal, copper, had a bulk wet-weight concentration that exceeded ten-times the Soluble Threshold Limit Concentration (STLC). As a result, the required waste extraction test (WET) was conducted on this compound. The test indicated that the soluble concentration of copper was six times lower than the applicable STLC limit that would designate the biosolids as hazardous within the State of California.

Copper occurs naturally in the mineralogy of ambient sediments in the central coast region. As a result, its presence in bulk biosolid samples is not unexpected because sediments enter the collection system through runoff. Copper also enters the collection system through internal corrosion of household plumbing systems, which probably accounts for its consistent detection at low concentrations within effluent samples. As with other metals, the bulk copper concentration determined in the August-2013 sample was comparable to concentrations measured in biosolids samples collected historically.

One synthetic organic compound, bis (2-ethylhexyl) phthalate (DEHP), was also detected at a low, but quantifiable concentration in the August-2013 biosolid sample. DEHP is added to plastic resins to soften them and has been consistently detected at low levels in both effluent and biosolid samples collected over the past decade.[c] There is no limit on this compound specified in State and Federal regulations governing biosolids.

Other compounds listed in Table 1 further characterize the biosolids as required in the waste discharge requirements.

Please contact the undersigned if you have any questions regarding these results.

Sincerely,

Bonnie Luke
Program Manager

Enclosure (Three Report Copies)

Table 1. Summary of Results for Biosolids Analyses

		Wet Weight				Dry Weight		
		Measured		Limit		Measured	Limit	
Constituent	**Units**	**Bulk [d]**	**WET [e]**	**STLC [f]**	**TTLC [g]**	**Bulk**	**Monthly [h]**	**Ceiling [i]**
Solids	%	86.2	— [j]	—	—	—	—	—
Total Dissolved Solids	ppm	—	5,000.	—	—	—	—	—
Cyanide	ppm	2.8	—	—	—	3.3	—	—
Antimony	ppm	≈2.4[k]	—	15.	500.	≈2.8	—	—
Arsenic	ppm	3.7	—	5.	500.	4.3	41.	75.
Barium	ppm	300.	—	100.	10,000.	350.	—	—
Beryllium	ppm	≈0.094	—	0.75	75.	≈0.11	—	—
Boron	ppm	16.	—	—	—	18.	—	—
Cadmium	ppm	2.4	—	1.	100.	2.8	39.	85.
Chromium (Total)	ppm	37.	—	560.	2,500.	43.	—	—
Chromium (Hexavalent)	ppm	5.1	ND [l]	5.	500.	5.9	—	—
Cobalt	ppm	3.4	—	80.	8,000.	3.9	1,500.	4,300.
Copper	ppm	450.[m]	3.8	25.	2,500.	520.	1,500.	4,300.
Lead	ppm	32.	—	5.	1,000.	38.	300.	840.
Mercury	ppm	0.84	—	0.2	20.	0.97	17.	57.
Molybdenum	ppm	16.	—	350.	3,500.	19.	—	—
Nickel	ppm	30.	—	20.	2,000.	35.	420.	420.
Selenium	ppm	9.9	—	1.	100.	12.	100.	100.
Silver	ppm	3.5	—	5.	500.	4.1	—	—
Thallium	ppm	ND	—	7.	700.	ND	—	—
Vanadium	ppm	21.	—	24.	2,400.	24.	—	—
Zinc	ppm	1,000.	—	250.	5,000.	1,200.	2,800.	7,500.
Bis(2-ethylhexyl) phthalate	ppm	19.	—	—	—	22.	—	—
Hydrogen-Ion	pH	6.61	—	—	—	—	—	—
Phosphate	mg/kg	70,000.	—	—	—	81,000.	—	—
Ammonia	mg/kg	6,300.	—	—	—	7,300.	—	—
TKN	mg/kg	28,000.	—	—	—	32,000.	—	—
Organic Nitrogen[n]	mg/kg	21,700.	—	—	—	24,700.	—	—
Nitrate as NO_3	mg/kg	ND	—	—	—	ND	—	—
Oil & Grease	ppm	44,000.	—	—	—	51,000.	—	—

[a] Marine Research Specialists (MRS). 1999 through 2012. City of Morro Bay and Cayucos Sanitary District, Residual Biosolids Chemical Analysis Results. Prepared for the City of Morro Bay and Cayucos Sanitary District, Morro Bay, CA. http://www.morro-bay.ca.us/Archive.aspx?ADID=1671

[b] U.S. Government Printing Office (USGPO). 1997b. Code of Federal Regulations. Environmental Protection. Standards for the use or disposal of Sewage Sludge, Land Application, Pollutant Limits. Chapter 40, Part 503, Subpart B. 1 July 1997 edition.

[c] Section 2.3.2, Page 2-34 of the MBCSD 2012 Annual Report to the City of Morro Bay and Cayucos Sanitary District. Prepared by Marine Research Specialists, March 2013. http://www.morro-bay.ca.us/Archive.aspx?ADID=1781

[d] The total wet-weight concentration (mg/kg) within a bulk biosolid sample consisting of the entire millable solid matrix rather than just the leachate.

[e] Waste Extraction Tests (WET) measure the soluble leachate (mg/L) or the extractable amount of a substance contained within a bulk sample of biosolids. A WET is indicated if the bulk wet-weight concentration of a contaminant in a biosolids sample exceeds ten times the STLC.

[f] Soluble Threshold Limit Concentrations (STLC) apply to the measured concentration in the liquid extract from a biosolid sample, as determined by a WET. Biosolids with leachate concentrations exceeding the STLC are classified as hazardous in the State of California as described in the California Code of Regulations (CCR), Title 22, Chapter 11: *Identification and Listing of Hazardous Waste*.

[g] Total Threshold Limit Concentrations (TTLC) apply to the total wet-weight concentration of a contaminant (mg/kg) within a bulk biosolid sample. Biosolids are designated as hazardous wastes in the State of California if measured bulk concentrations exceed the TTLC as described in the CCRs, *op. cit.*

[h] Federally mandated dry-weight limits imposed on biosolids suitable for application on agricultural land apply to monthly average concentrations as defined in Table 3 of the Code of Federal Regulations (CFRs). Environmental Protection. Standards for the use or disposal of Sewage Sludge, Land Application, Pollutant Limits. Chapter 40, Part 503, Subpart B [40 CFR §503.13(b)(1)].

[i] Federally mandated dry-weight ceiling concentrations above which biosolids are considered hazardous waste as defined in Table 1 of the CFRs, *op. cit.*

[j] "—" indicates that the measurement was not required or its limit was not specified.

[k] "≈" indicates the reported concentration was too low to be reliably quantified.

[l] "ND" indicates that the measurement was not detected in concentrations exceeding the method detection limit.

[m] The bulk concentration was greater than ten times the STLC and a WET was conducted.

[n] The amount of nitrogen as reported by TKN excluding ammonia

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Date of Report: 09/10/2013

Doug Coats

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Biosolids from MBWWTP
BC Work Order: 1317996
Invoice ID: B154819

Enclosed are the results of analyses for samples received by the laboratory on 8/21/2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Tina Green

Contact Person: Tina Green
Client Services Manager

Authorized Signature

Table of Contents

Case Narratives

Case Narrative for Work Order 1317996

2- CEVE can only be reported as a TIC (Tentatively Identified Compound). 2-CEVE was not found as a TIC for lab 13-17996)

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949.

Chain of Custody Form

Report To: Client: Marine Research Specialists	Project #:
Attn: Doug Coats	Project Name: MBCSD Biosolids
Street Address: 3140 Telegraph Rd. Suite A	Global ID #:
City, State, Zip: Ventura, CA 93003	Sampler(s):
Phone: 805-644-1180	Neza Chavira
Email Address: doug.coats@mrsenv.com	D. Bierman
Work Order# 13-17996	

Analysis Requested

Sample #	Description	Date Sampled	Time Sampled	Moisture, EPA 160.3 or BC	TDS, mod. STLC EPA 160.1	CAM 17 metals + Boron	TKN, EPA 351.2	Ammonia as N, EPA 350.1	Nitrate as NO3, EPA 300.0	Total Phosphate, EPA 365.4	Total Cyanide, EPA 9012	pH, EPA 9045 or 150.1	Sample Matrix: Soil	Sludge	Drinking Water	Ground water	Waste Water	Other	Notes
1	Composite Biosolids	~~8/20/13~~ 8/21/13		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓					

Comments:
page 1 of 2

Please see attached PDF for full explanations/details of individual analyses!

Are there any tests with holding times less than or equal to 48 hours? ☐ Yes ☐ No

CHK BY DISTRIBUTION
MA KT SUM JLK
SUB-OUT

Billing

☑ Same as above

Client:
Address:
City: State Zip
Attn:
PO#:

EDF Required? ☐ Yes ☐ No

Send Copy to State of CA? ☐ Yes ☐ No

Sample Disposal
☐ Return to Client ☐ Disposal by lab ☐ Archive Months

Special Reporting
☐ QC ☐ EDF ☐ Raw Data

	1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
Row 1		8-21-13	1500		8/21/13	1520			
Row 2		8/21/13	2044		6/21	2045			

13-17996

Analysis and Reporting for the Biosolids Sample from the Morro Bay Wastewater Treatment Plant to be collected on ~~28 August 2013~~[a] 21 August 2013

Analysis[b]	Method
Level IIA QC	
Waste Extraction Tests on copper[c] **(CCR Title 22, Article 11)**	STLC (6010)
Moisture	EPA 160.3 or BC
Total Dissolved Solids (TDS)	Modified Waste Extraction Test (STLC) EPA 160.1
CAM-17 Metals and Boron[d]:	
Antimony (Sb)	6010
Arsenic (As)	6010
Barium (Ba)	6010
Beryllium (Be)	6010
Boron (B)	6010
Cadmium (Cd)	6010
Total Chromium (Cr)	6010
Cobalt (Co)	6010
Copper (Cu)	6010
Lead (Pb)	6010
Mercury (Hg)	7471
Molybdenum (Mo)	6010
Nickel (Ni)	6010
Selenium (Se)	6010
Silver (Ag)	6010
Thallium (Tl)	6010
Vanadium (Va)	6010
Zinc (Zn)	6010
Total Kjeldahl Nitrogen (TKN)[d]	EPA 351.2
Ammonia as N[d]	EPA 350.1
Nitrate as NO_3[d]	EPA 300.0 or 353.2

[a] Please provide preliminary (pre-QC) results in BC LabNet as soon as they become available.

[b] Prior to analysis, homogenize the composite sample in the laboratory to ensure uniform distribution of multiple subsamples in sample container(s)

[c] Other metals may need to be WET tested depending on their bulk concentrations (e.g. lead, mercury). Ms. Luke (805.289.3926) will determine the need for additional WET tests based on the preliminary bulk-chemistry analysis of metals.

[d] Sample results to be reported on an '*as received*' and '*dry basis*.'

[e] Modified-extraction, using DI water to extract not citric acid

13-17996

Analysis[b]	Method
Total Phosphate[d]	EPA 365.4
Total Cyanide[d]	EPA 9012
pH	EPA 9045 or 150.1
Oil and Grease	EPA 1664
Semi-volatile Organics	EPA 8270/625
Pesticides and PCBs	EPA 8080/608
Volatile Organics – Low Level; report all EPA priority pollutants not reported under other methods (including **acrolein, acrylonitrile, and 2-chloroethyl vinyl ether**)	EPA 8240/624
Hexavalent Chromium (Total)[d,]	EPA 7196
Hexavalent Chromium[e]	Modified Waste Extraction Test (STLC) EPA 7196

Chain of Custody and Cooler Receipt Form for 1317996 Page 4 of 4

Rev. No. 15 07/01/13 Page 1 of 1

Submission #: 13-17996

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery
BC Lab Field Service ☑ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☑ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☑ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☑ Comments:

All samples received? Yes ☑ No ☐ All samples containers intact? Yes ☑ No ☐ Description(s) match COC? Yes ☑ No ☐

COC Received ☑ YES ☐ NO

Emissivity: 0.97 Container: Clear glass Thermometer ID: 207

Temperature: (A) 4.8 °C / (C) 4.7 °C

Date/Time 8/21/13 2045

Analyst Init KIO

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
GENERAL MINERAL/ GENERAL										
PE UNPRESERVED										
INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS										
CYANIDE										
NITROGEN FORMS										
TOTAL SULFIDE										
NITRATE / NITRITE										
TOTAL ORGANIC CARBON										
TOX										
CHEMICAL OXYGEN DEMAND										
PHENOLICS										
VOA VIAL TRAVEL BLANK										
VOA VIAL										
EPA 413.1, 413.2, 418.1										
ODOR										
BIOLOGICAL										
BACTERIOLOGICAL										
VOA VIAL- 504										
EPA 506/608/8080										
EPA 515.1/8150										
EPA 525										
EPA 525 TRAVEL BLANK										
EPA 547										
EPA 531.1										
EPA 548										
EPA 549										
EPA 632										
EPA 8015M										
AMBER										
1 L JAR 3202	ABCDEF									
2 L JAR										
4 L SLEEVE										
VIAL										
STIC BAG										
HOMOGEN										
CORE										
SET KIT										
[illegible]										

KIO 8/21/13 @ 2120

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1317996-01	**COC Number:**	---	**Receive Date:**	08/21/2013 20:45
	Project Number:	---	**Sampling Date:**	08/21/2013 09:50
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	Composite Biosoilds	**Lab Matrix:**	Solids
	Sampled By:	---	**Sample Type:**	Soil

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Aldrin	ND	ND	mg/kg	0.0025	0.00013	EPA-8080	ND	A10	1
alpha-BHC	ND	ND	mg/kg	0.0025	0.00070	EPA-8080	ND	A10	1
beta-BHC	ND	ND	mg/kg	0.0025	0.0019	EPA-8080	ND	A10	1
delta-BHC	ND	ND	mg/kg	0.0025	0.00038	EPA-8080	ND	A10	1
gamma-BHC (Lindane)	ND	ND	mg/kg	0.0025	0.0012	EPA-8080	ND	A10	1
Chlordane (Technical)	ND	ND	mg/kg	0.25	0.075	EPA-8080	ND	A10	1
4,4'-DDD	ND	ND	mg/kg	0.0025	0.00032	EPA-8080	ND	A10	1
4,4'-DDE	ND	ND	mg/kg	0.0025	0.00022	EPA-8080	ND	A10	1
4,4'-DDT	ND	ND	mg/kg	0.0025	0.00016	EPA-8080	ND	A10	1
Dieldrin	ND	ND	mg/kg	0.0025	0.00016	EPA-8080	ND	A10	1
Endosulfan I	ND	ND	mg/kg	0.0025	0.00043	EPA-8080	ND	A10	1
Endosulfan II	ND	ND	mg/kg	0.0025	0.00033	EPA-8080	ND	A10	1
Endosulfan sulfate	ND	ND	mg/kg	0.0025	0.00065	EPA-8080	ND	A10	1
Endrin	ND	ND	mg/kg	0.0025	0.00018	EPA-8080	ND	A10	1
Endrin aldehyde	ND	ND	mg/kg	0.0025	0.00030	EPA-8080	ND	A10	1
Heptachlor	ND	ND	mg/kg	0.0025	0.0013	EPA-8080	ND	A10	1
Heptachlor epoxide	ND	ND	mg/kg	0.0025	0.00075	EPA-8080	ND	A10	1
Methoxychlor	ND	ND	mg/kg	0.0025	0.00065	EPA-8080	ND	A10	1
Toxaphene	ND	ND	mg/kg	0.25	0.037	EPA-8080	ND	A10	1
PCB-1016	ND	ND	mg/kg	0.050	0.014	EPA-8080	ND	A10	1
PCB-1221	ND	ND	mg/kg	0.050	0.025	EPA-8080	ND	A10	1
PCB-1232	ND	ND	mg/kg	0.050	0.0060	EPA-8080	ND	A10	1
PCB-1242	ND	ND	mg/kg	0.050	0.0081	EPA-8080	ND	A10	1
PCB-1248	ND	ND	mg/kg	0.050	0.0060	EPA-8080	ND	A10	1
PCB-1254	ND	ND	mg/kg	0.050	0.0039	EPA-8080	ND	A10	1
PCB-1260	ND	ND	mg/kg	0.050	0.011	EPA-8080	ND	A10	1
Total PCB's (Summation)	ND	ND	mg/kg	0.050	0.025	EPA-8080	ND	A10	1
TCMX (Surrogate)	154	154	%	20 - 140 (LCL - UCL)		EPA-8080		A10,S09	1
Decachlorobiphenyl (Surrogate)	378	378	%	20 - 140 (LCL - UCL)		EPA-8080		A10,S09	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8080	08/29/13	08/30/13 13:52	VH1	GC-15	5.017	BWI0044

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10,S08	1
Bromodichloromethane	ND	ND	mg/kg	0.010	0.0017	EPA-8240	ND	A10,S08	1
Bromoform	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A10,S08	1
Bromomethane	ND	ND	mg/kg	0.010	0.0032	EPA-8240	ND	A10,S08	1
Carbon tetrachloride	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10,S08	1
Chlorobenzene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10,S08	1
Chloroethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10,S08	1
Chloroform	ND	ND	mg/kg	0.010	0.0013	EPA-8240	ND	A10,S08	1
Chloromethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10,S08	1
Dibromochloromethane	ND	ND	mg/kg	0.010	0.0020	EPA-8240	ND	A10,S08	1
1,2-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0016	EPA-8240	ND	A10,S08	1
1,3-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10,S08	1
1,4-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A10,S08	1
1,1-Dichloroethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10,S08	1
1,2-Dichloroethane	ND	ND	mg/kg	0.010	0.0017	EPA-8240	ND	A10,S08	1
1,1-Dichloroethene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A10,S08	1
trans-1,2-Dichloroethene	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10,S08	1
1,2-Dichloropropane	ND	ND	mg/kg	0.010	0.0016	EPA-8240	ND	A10,S08	1
cis-1,3-Dichloropropene	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10,S08	1
trans-1,3-Dichloropropene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A10,S08	1
Ethylbenzene	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A10,S08	1
Methylene chloride	ND	ND	mg/kg	0.020	0.0048	EPA-8240	ND	A10,S08	1
Methyl t-butyl ether	ND	ND	mg/kg	0.010	0.0010	EPA-8240	ND	A10,S08	1
1,1,2,2-Tetrachloroethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10,S08	1
Tetrachloroethene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10,S08	1
Toluene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A10,S08	1
1,1,1-Trichloroethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10,S08	1
1,1,2-Trichloroethane	ND	ND	mg/kg	0.010	0.0015	EPA-8240	ND	A10,S08	1
Trichloroethene	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10,S08	1
Trichlorofluoromethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10,S08	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10,S08	1
Vinyl chloride	ND	ND	mg/kg	0.010	0.0032	EPA-8240	ND	A10,S08	1

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Xylenes	ND	ND	mg/kg	0.020	0.0068	EPA-8240	ND	A10,S08	1
Acrolein	ND	ND	mg/kg	0.10	0.015	EPA-8240	ND	A10,S08	1
Acrylonitrile	ND	ND	mg/kg	0.040	0.0094	EPA-8240	ND	A10,S08	1
1,2-Dichloroethane-d4 (Surrogate)	125	125	%	70 - 121 (LCL - UCL)		EPA-8240		A19,S09	1
Toluene-d8 (Surrogate)	86.9	86.9	%	81 - 117 (LCL - UCL)		EPA-8240			1
4-Bromofluorobenzene (Surrogate)	76.8	76.8	%	74 - 121 (LCL - UCL)		EPA-8240			1
TIC: 2-Butanone	0.14	0.12	**mg/kg**			**EPA-8240**		**A10,S08**	1
TIC: 2-Ethyl-1-hexanol	0.096	0.083	**mg/kg**			**EPA-8240**		**A10,S08**	1
TIC: 2-Methyl-1-propanol	0.055	0.048	**mg/kg**			**EPA-8240**		**A10,S08**	1
TIC: 3-Methyl-1-butanol	0.10	0.090	**mg/kg**			**EPA-8240**		**A10,S08**	1
TIC: Acetone	0.24	0.21	**mg/kg**			**EPA-8240**		**A10,S08**	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8240	08/22/13	08/26/13 21:19	MJB	MS-V3	2	BWH1241

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3140 Telegraph Road, Suite A
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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
Acenaphthylene	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Aldrin	ND	ND	mg/kg	4.0	0.95	EPA-8270C	ND	A10	1
Aniline	ND	ND	mg/kg	7.9	2.1	EPA-8270C	ND	A10	1
Anthracene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
Benzidine	ND	ND	mg/kg	120	8.7	EPA-8270C	ND	A10	1
Benzo[a]anthracene	ND	ND	mg/kg	4.0	0.48	EPA-8270C	ND	A10	1
Benzo[b]fluoranthene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
Benzo[k]fluoranthene	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Benzo[a]pyrene	ND	ND	mg/kg	4.0	0.60	EPA-8270C	ND	A10	1
Benzo[g,h,i]perylene	ND	ND	mg/kg	4.0	2.2	EPA-8270C	ND	A10	1
Benzoic acid	ND	ND	mg/kg	20	2.7	EPA-8270C	ND	A10	1
Benzyl alcohol	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
Benzyl butyl phthalate	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
alpha-BHC	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
beta-BHC	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
delta-BHC	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
gamma-BHC (Lindane)	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
bis(2-Chloroethoxy)methane	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
bis(2-Chloroethyl) ether	ND	ND	mg/kg	4.0	0.64	EPA-8270C	ND	A10	1
bis(2-Chloroisopropyl)ether	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
bis(2-Ethylhexyl)phthalate	22	19	**mg/kg**	**7.9**	**1.7**	**EPA-8270C**	ND	**A10**	1
4-Bromophenyl phenyl ether	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
4-Chloroaniline	ND	ND	mg/kg	4.0	1.1	EPA-8270C	ND	A10	1
2-Chloronaphthalene	ND	ND	mg/kg	4.0	0.79	EPA-8270C	ND	A10	1
4-Chlorophenyl phenyl ether	ND	ND	mg/kg	4.0	0.60	EPA-8270C	ND	A10	1
Chrysene	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
4,4'-DDD	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
4,4'-DDE	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
4,4'-DDT	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Dibenzo[a,h]anthracene	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Dibenzofuran	ND	ND	mg/kg	4.0	0.79	EPA-8270C	ND	A10	1

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
1,2-Dichlorobenzene	ND	ND	mg/kg	4.0	0.79	EPA-8270C	ND	A10	1
1,3-Dichlorobenzene	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
1,4-Dichlorobenzene	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
3,3-Dichlorobenzidine	ND	ND	mg/kg	7.9	0.27	EPA-8270C	ND	A10	1
Dieldrin	ND	ND	mg/kg	4.0	1.2	EPA-8270C	ND	A10	1
Diethyl phthalate	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Dimethyl phthalate	ND	ND	mg/kg	4.0	0.79	EPA-8270C	ND	A10	1
Di-n-butyl phthalate	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
2,4-Dinitrotoluene	ND	ND	mg/kg	4.0	0.87	EPA-8270C	ND	A10	1
2,6-Dinitrotoluene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
Di-n-octyl phthalate	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
1,2-Diphenylhydrazine	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Endosulfan I	ND	ND	mg/kg	7.9	0.79	EPA-8270C	ND	A10	1
Endosulfan II	ND	ND	mg/kg	7.9	0.83	EPA-8270C	ND	A10	1
Endosulfan sulfate	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
Endrin	ND	ND	mg/kg	7.9	0.99	EPA-8270C	ND	A10	1
Endrin aldehyde	ND	ND	mg/kg	20	0.87	EPA-8270C	ND	A10	1
Fluoranthene	2.0	1.7	**mg/kg**	**4.0**	**0.68**	**EPA-8270C**	ND	**J,A10**	1
Fluorene	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Heptachlor	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
Heptachlor epoxide	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
Hexachlorobenzene	ND	ND	mg/kg	4.0	0.64	EPA-8270C	ND	A10	1
Hexachlorobutadiene	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
Hexachlorocyclopentadiene	ND	ND	mg/kg	4.0	0.75	EPA-8270C	ND	A10	1
Hexachloroethane	ND	ND	mg/kg	4.0	0.79	EPA-8270C	ND	A10	1
Indeno[1,2,3-cd]pyrene	ND	ND	mg/kg	4.0	2.9	EPA-8270C	ND	A10	1
Isophorone	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
2-Methylnaphthalene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
Naphthalene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
2-Naphthylamine	ND	ND	mg/kg	120	6.4	EPA-8270C	ND	A10	1
2-Nitroaniline	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
3-Nitroaniline	ND	ND	mg/kg	7.9	0.60	EPA-8270C	ND	A10	1

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
4-Nitroaniline	ND	ND	mg/kg	7.9	0.99	EPA-8270C	ND	A10	1
Nitrobenzene	ND	ND	mg/kg	4.0	0.60	EPA-8270C	ND	A10	1
N-Nitrosodimethylamine	ND	ND	mg/kg	4.0	1.5	EPA-8270C	ND	A10	1
N-Nitrosodi-N-propylamine	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
N-Nitrosodiphenylamine	ND	ND	mg/kg	4.0	0.83	EPA-8270C	ND	A10	1
Phenanthrene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
Pyrene	2.2	1.9	**mg/kg**	**4.0**	**0.68**	**EPA-8270C**	ND	**J,A10**	1
1,2,4-Trichlorobenzene	ND	ND	mg/kg	4.0	0.72	EPA-8270C	ND	A10	1
4-Chloro-3-methylphenol	ND	ND	mg/kg	7.9	0.87	EPA-8270C	ND	A10	1
2-Chlorophenol	ND	ND	mg/kg	4.0	0.64	EPA-8270C	ND	A10	1
2,4-Dichlorophenol	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
2,4-Dimethylphenol	ND	ND	mg/kg	4.0	1.4	EPA-8270C	ND	A10	1
4,6-Dinitro-2-methylphenol	ND	ND	mg/kg	20	0.48	EPA-8270C	ND	A10	1
2,4-Dinitrophenol	ND	ND	mg/kg	20	0.31	EPA-8270C	ND	A10	1
2-Methylphenol	ND	ND	mg/kg	4.0	0.68	EPA-8270C	ND	A10	1
3- & 4-Methylphenol	ND	ND	mg/kg	7.9	1.3	EPA-8270C	ND	A10	1
2-Nitrophenol	ND	ND	mg/kg	4.0	0.64	EPA-8270C	ND	A10	1
4-Nitrophenol	ND	ND	mg/kg	7.9	0.72	EPA-8270C	ND	A10	1
Pentachlorophenol	ND	ND	mg/kg	7.9	0.52	EPA-8270C	ND	A10	1
Phenol	1.2	1.0	**mg/kg**	**4.0**	**0.64**	**EPA-8270C**	ND	**J,A10**	1
2,4,5-Trichlorophenol	ND	ND	mg/kg	7.9	0.72	EPA-8270C	ND	A10	1
2,4,6-Trichlorophenol	ND	ND	mg/kg	7.9	0.68	EPA-8270C	ND	A10	1
2-Fluorophenol (Surrogate)	49.5	49.5	%	28 - 144 (LCL - UCL)		EPA-8270C		A10	1
Phenol-d5 (Surrogate)	51.0	51.0	%	36 - 136 (LCL - UCL)		EPA-8270C		A10	1
Nitrobenzene-d5 (Surrogate)	57.2	57.2	%	31 - 135 (LCL - UCL)		EPA-8270C		A10	1
2-Fluorobiphenyl (Surrogate)	67.2	67.2	%	20 - 140 (LCL - UCL)		EPA-8270C		A10	1
2,4,6-Tribromophenol (Surrogate)	63.8	63.8	%	20 - 150 (LCL - UCL)		EPA-8270C		A10	1
p-Terphenyl-d14 (Surrogate)	50.0	50.0	%	30 - 150 (LCL - UCL)		EPA-8270C		A10	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8270C	08/24/13	08/27/13 23:40	SKC	MS-B2	39.735	BWH2241

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	51000	44000	**mg/kg**	**250**	**100**	**EPA-1664A HEM**	ND	**A09**	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-1664A HEM	09/03/13	09/03/13 13:30	JAK	MAN-SV	5	BWI0160

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Chemical Analysis

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Moisture	0	13.8	**%**	**0.05**	**0.05**	**Calc**	ND		1
Total Cyanide	3.3	2.8	**mg/kg**	**0.50**	**0.37**	**EPA-9012**	ND		2
pH	6.61	6.61	**pH Units**	**0.05**	**0.05**	**EPA-9045**		**pH1:3**	3
pH Measurement Temperature	24.4	24.4	**C**	**0.1**	**0.1**	**EPA-9045**			3
Nitrate as NO3	ND	ND	mg/kg	4.4	1.2	EPA-300.0	ND		4
Total Kjeldahl Nitrogen	32000	28000	**mg/kg**	**4000**	**1500**	**EPA-351.2**	ND	**A01**	5
Ammonia as N	7300	6300	**mg/kg**	**500**	**250**	**EPA-350.1**	ND	**A01**	6
Total Phosphate	81000	70000	**mg/kg**	**3000**	**1000**	**EPA-365.4**	ND	**A01**	7
Solids	100	86.2	**%**	**0.05**	**0.05**	**SM-2540G**			8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	Calc	08/22/13	09/03/13 14:03	TMS	Calc	1	BWH1820
2	EPA-9012	08/28/13	08/28/13 14:05	TDC	KONE-1	0.962	BWH2320
3	EPA-9045	09/04/13	09/04/13 15:00	DIW	MANUAL	1	BWI0266
4	EPA-300.0	08/27/13	08/28/13 03:27	LD1	IC2	1	BWH2161
5	EPA-351.2	08/26/13	08/28/13 01:19	SDU	SC-1	100	BWH2083
6	EPA-350.1	08/23/13	08/27/13 11:56	TDC	SC-1	48.077	BWH1954
7	EPA-365.4	08/26/13	08/28/13 00:25	SDU	SC-1	100	BWH2084
8	SM-2540G	08/27/13	08/27/13 20:30	RAC	MANUAL	1	BWH2304

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Modified WET Test (STLC)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Hexavalent Chromium		ND	mg/L	0.20	0.070	EPA-7196	ND		1
Total Dissolved Solids @ 180 C		5000	**mg/L**	**200**	**200**	**EPA-160.1**	ND		2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-7196	08/29/13	08/29/13 13:48	TDC	KONE-1	1	BWI0048
2	EPA-160.1	08/31/13	08/31/13 15:30	FRP	MANUAL	20	BWH1514

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Reported: 09/10/2013 13:11
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Project Manager: Doug Coats

WET Test (STLC)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Copper		3.8	**mg/L**	**0.10**	**0.012**	**EPA-6010B**	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	08/29/13	08/30/13 08:57	ARD	PE-OP2	1	BWH2543

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Total Concentrations (TTLC)

BCL Sample ID: 1317996-01 | **Client Sample Name:** Composite Biosoilds, 8/21/2013 9:50:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Antimony	2.8	2.4	**mg/kg**	**5.0**	**0.33**	**EPA-6010B**	ND	**J**	1
Arsenic	4.3	3.7	**mg/kg**	**1.0**	**0.40**	**EPA-6010B**	ND		1
Barium	350	300	**mg/kg**	**0.50**	**0.18**	**EPA-6010B**	ND		1
Beryllium	0.11	0.094	mg/kg	0.50	0.047	EPA-6010B	ND	J	1
Cadmium	2.8	2.4	**mg/kg**	**0.50**	**0.052**	**EPA-6010B**	ND		1
Chromium	43	37	**mg/kg**	**0.50**	**0.050**	**EPA-6010B**	ND		1
Total Hexavalent Chromium	5.9	5.1	**mg/kg**	**5.0**	**2.0**	**EPA-7199**	ND	**A10**	2
Cobalt	3.9	3.4	**mg/kg**	**2.5**	**0.098**	**EPA-6010B**	ND		1
Copper	520	450	**mg/kg**	**1.0**	**0.050**	**EPA-6010B**	ND		1
Lead	38	32	**mg/kg**	**2.5**	**0.28**	**EPA-6010B**	ND		1
Mercury	0.97	0.84	**mg/kg**	**0.16**	**0.025**	**EPA-7471A**	0.036		3
Molybdenum	19	16	**mg/kg**	**2.5**	**0.050**	**EPA-6010B**	0.072		1
Nickel	35	30	**mg/kg**	**0.50**	**0.15**	**EPA-6010B**	ND		1
Selenium	12	9.9	**mg/kg**	**1.0**	**0.98**	**EPA-6010B**	ND		1
Silver	4.1	3.5	**mg/kg**	**0.50**	**0.067**	**EPA-6010B**	ND		1
Thallium	ND	ND	mg/kg	5.0	0.64	EPA-6010B	ND		1
Vanadium	24	21	**mg/kg**	**0.50**	**0.11**	**EPA-6010B**	ND		1
Zinc	1200	1000	**mg/kg**	**2.5**	**0.087**	**EPA-6010B**	ND		1
Boron	18	16	**mg/kg**	**5.0**	**0.50**	**EPA-6010B**	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	08/28/13	08/29/13 08:45	ARD	PE-OP2	0.990	BWH2342
2	EPA-7199	08/27/13	08/28/13 21:24	LS1	IC-4	5	BWH2360
3	EPA-7471A	08/26/13	08/27/13 10:33	MEV	CETAC1	0.977	BWH2097

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWI0044						
Aldrin	BWI0044-BLK1	ND	mg/kg	0.00050	0.000026	
alpha-BHC	BWI0044-BLK1	ND	mg/kg	0.00050	0.00014	
beta-BHC	BWI0044-BLK1	ND	mg/kg	0.00050	0.00038	
delta-BHC	BWI0044-BLK1	ND	mg/kg	0.00050	0.000076	
gamma-BHC (Lindane)	BWI0044-BLK1	ND	mg/kg	0.00050	0.00025	
Chlordane (Technical)	BWI0044-BLK1	ND	mg/kg	0.050	0.015	
4,4'-DDD	BWI0044-BLK1	ND	mg/kg	0.00050	0.000063	
4,4'-DDE	BWI0044-BLK1	ND	mg/kg	0.00050	0.000045	
4,4'-DDT	BWI0044-BLK1	ND	mg/kg	0.00050	0.000031	
Dieldrin	BWI0044-BLK1	ND	mg/kg	0.00050	0.000032	
Endosulfan I	BWI0044-BLK1	ND	mg/kg	0.00050	0.000086	
Endosulfan II	BWI0044-BLK1	ND	mg/kg	0.00050	0.000066	
Endosulfan sulfate	BWI0044-BLK1	ND	mg/kg	0.00050	0.00013	
Endrin	BWI0044-BLK1	ND	mg/kg	0.00050	0.000035	
Endrin aldehyde	BWI0044-BLK1	ND	mg/kg	0.00050	0.000061	
Heptachlor	BWI0044-BLK1	ND	mg/kg	0.00050	0.00026	
Heptachlor epoxide	BWI0044-BLK1	ND	mg/kg	0.00050	0.00015	
Methoxychlor	BWI0044-BLK1	ND	mg/kg	0.00050	0.00013	
Toxaphene	BWI0044-BLK1	ND	mg/kg	0.050	0.0074	
PCB-1016	BWI0044-BLK1	ND	mg/kg	0.010	0.0027	
PCB-1221	BWI0044-BLK1	ND	mg/kg	0.010	0.0050	
PCB-1232	BWI0044-BLK1	ND	mg/kg	0.010	0.0012	
PCB-1242	BWI0044-BLK1	ND	mg/kg	0.010	0.0016	
PCB-1248	BWI0044-BLK1	ND	mg/kg	0.010	0.0012	
PCB-1254	BWI0044-BLK1	ND	mg/kg	0.010	0.00078	
PCB-1260	BWI0044-BLK1	ND	mg/kg	0.010	0.0022	
Total PCB's (Summation)	BWI0044-BLK1	ND	mg/kg	0.010	0.0050	
TCMX (Surrogate)	BWI0044-BLK1	109	%	20 - 140 (LCL - UCL)		
Decachlorobiphenyl (Surrogate)	BWI0044-BLK1	89.2	%	20 - 140 (LCL - UCL)		

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Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWI0044										
Aldrin	BWI0044-BS1	LCS	0.0058731	0.0050505	mg/kg	116		70 - 130		
gamma-BHC (Lindane)	BWI0044-BS1	LCS	0.0059616	0.0050505	mg/kg	118		60 - 140		
4,4'-DDT	BWI0044-BS1	LCS	0.0047508	0.0050505	mg/kg	94.1		60 - 140		
Dieldrin	BWI0044-BS1	LCS	0.0058017	0.0050505	mg/kg	115		70 - 130		
Endrin	BWI0044-BS1	LCS	0.0054636	0.0050505	mg/kg	108		60 - 140		
Heptachlor	BWI0044-BS1	LCS	0.0056118	0.0050505	mg/kg	111		70 - 130		
TCMX (Surrogate)	BWI0044-BS1	LCS	0.011387	0.010101	mg/kg	113		20 - 140		
Decachlorobiphenyl (Surrogate)	BWI0044-BS1	LCS	0.022722	0.025253	mg/kg	90.0		20 - 140		

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Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWI0044	Used client sample: N										
Aldrin	MS	1318312-01	ND	0.0080950	0.0049669	mg/kg		163		30 - 140	Q03
	MSD	1318312-01	ND	0.0048690	0.0050505	mg/kg	49.8	96.4	30	30 - 140	Q02
gamma-BHC (Lindane)	MS	1318312-01	ND	0.0024172	0.0049669	mg/kg		48.7		30 - 140	
	MSD	1318312-01	ND	0.0026054	0.0050505	mg/kg	7.5	51.6	30	30 - 140	
4,4'-DDT	MS	1318312-01	0.037741	0.082412	0.0049669	mg/kg		899		30 - 140	Q03
	MSD	1318312-01	0.037741	0.092403	0.0050505	mg/kg	11.4	1080	30	30 - 140	Q03
Dieldrin	MS	1318312-01	0.44017	0.49498	0.0049669	mg/kg		1100		40 - 140	Q03
	MSD	1318312-01	0.44017	0.54628	0.0050505	mg/kg	9.9	2100	30	40 - 140	Q03
Endrin	MS	1318312-01	0.0068047	0.012205	0.0049669	mg/kg		109		30 - 150	
	MSD	1318312-01	0.0068047	0.012179	0.0050505	mg/kg	0.2	106	30	30 - 150	
Heptachlor	MS	1318312-01	ND	0.0040636	0.0049669	mg/kg		81.8		40 - 140	
	MSD	1318312-01	ND	0.0029694	0.0050505	mg/kg	31.1	58.8	30	40 - 140	Q02
TCMX (Surrogate)	MS	1318312-01	ND	0.0040583	0.0099338	mg/kg		40.9		20 - 140	
	MSD	1318312-01	ND	0.0060606	0.010101	mg/kg	39.6	60.0		20 - 140	
Decachlorobiphenyl (Surrogate)	MS	1318312-01	ND	0.022073	0.024834	mg/kg		88.9		20 - 140	
	MSD	1318312-01	ND	0.018486	0.025253	mg/kg	17.7	73.2		20 - 140	

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Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH1241						
Benzene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0013	
Bromodichloromethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.00084	
Bromoform	BWH1241-BLK1	ND	mg/kg	0.0050	0.0015	
Bromomethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0016	
Carbon tetrachloride	BWH1241-BLK1	ND	mg/kg	0.0050	0.0011	
Chlorobenzene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0013	
Chloroethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0014	
Chloroform	BWH1241-BLK1	ND	mg/kg	0.0050	0.00063	
Chloromethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0014	
Dibromochloromethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.00099	
1,2-Dichlorobenzene	BWH1241-BLK1	ND	mg/kg	0.0050	0.00081	
1,3-Dichlorobenzene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0014	
1,4-Dichlorobenzene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0015	
1,1-Dichloroethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloroethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.00085	
1,1-Dichloroethene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0012	
trans-1,2-Dichloroethene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloropropane	BWH1241-BLK1	ND	mg/kg	0.0050	0.00081	
cis-1,3-Dichloropropene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0011	
trans-1,3-Dichloropropene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0012	
Ethylbenzene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0015	
Methylene chloride	BWH1241-BLK1	ND	mg/kg	0.010	0.0024	
Methyl t-butyl ether	BWH1241-BLK1	ND	mg/kg	0.0050	0.00050	
1,1,2,2-Tetrachloroethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0011	
Tetrachloroethene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0013	
Toluene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0012	
1,1,1-Trichloroethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloroethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.00077	
Trichloroethene	BWH1241-BLK1	ND	mg/kg	0.0050	0.0011	
Trichlorofluoromethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloro-1,2,2-trifluoroethane	BWH1241-BLK1	ND	mg/kg	0.0050	0.0013	
Vinyl chloride	BWH1241-BLK1	ND	mg/kg	0.0050	0.0016	
Total Xylenes	BWH1241-BLK1	ND	mg/kg	0.010	0.0034	
Acrolein	BWH1241-BLK1	ND	mg/kg	0.050	0.0073	

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Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH1241						
Acrylonitrile	BWH1241-BLK1	ND	mg/kg	0.020	0.0047	
1,2-Dichloroethane-d4 (Surrogate)	BWH1241-BLK1	100	%	70 - 121 (LCL - UCL)		
Toluene-d8 (Surrogate)	BWH1241-BLK1	96.9	%	81 - 117 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	BWH1241-BLK1	91.3	%	74 - 121 (LCL - UCL)		

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Volatile Organic Analysis (EPA Method 8240)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWH1241										
Benzene	BWH1241-BS1	LCS	0.11512	0.12500	mg/kg	92.1		70 - 130		
Bromodichloromethane	BWH1241-BS1	LCS	0.12339	0.12500	mg/kg	98.7		70 - 130		
Chlorobenzene	BWH1241-BS1	LCS	0.12348	0.12500	mg/kg	98.8		70 - 130		
Chloroethane	BWH1241-BS1	LCS	0.12303	0.12500	mg/kg	98.4		70 - 130		
1,4-Dichlorobenzene	BWH1241-BS1	LCS	0.12553	0.12500	mg/kg	100		70 - 130		
1,1-Dichloroethane	BWH1241-BS1	LCS	0.11837	0.12500	mg/kg	94.7		70 - 130		
1,1-Dichloroethene	BWH1241-BS1	LCS	0.10971	0.12500	mg/kg	87.8		70 - 130		
Toluene	BWH1241-BS1	LCS	0.11658	0.12500	mg/kg	93.3		70 - 130		
Trichloroethene	BWH1241-BS1	LCS	0.11474	0.12500	mg/kg	91.8		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	BWH1241-BS1	LCS	0.050690	0.050000	mg/kg	101		70 - 121		
Toluene-d8 (Surrogate)	BWH1241-BS1	LCS	0.049010	0.050000	mg/kg	98.0		81 - 117		
4-Bromofluorobenzene (Surrogate)	BWH1241-BS1	LCS	0.050130	0.050000	mg/kg	100		74 - 121		

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Volatile Organic Analysis (EPA Method 8240)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH1241	Used client sample: N										
Benzene	MS	1316295-05	ND	0.093660	0.12500	mg/kg		74.9		70 - 130	
	MSD	1316295-05	ND	0.098910	0.12500	mg/kg	5.5	79.1	20	70 - 130	
Bromodichloromethane	MS	1316295-05	ND	0.098360	0.12500	mg/kg		78.7		70 - 130	
	MSD	1316295-05	ND	0.10224	0.12500	mg/kg	3.9	81.8	20	70 - 130	
Chlorobenzene	MS	1316295-05	ND	0.096600	0.12500	mg/kg		77.3		70 - 130	
	MSD	1316295-05	ND	0.10287	0.12500	mg/kg	6.3	82.3	20	70 - 130	
Chloroethane	MS	1316295-05	ND	0.10610	0.12500	mg/kg		84.9		70 - 130	
	MSD	1316295-05	ND	0.10872	0.12500	mg/kg	2.4	87.0	20	70 - 130	
1,4-Dichlorobenzene	MS	1316295-05	ND	0.099380	0.12500	mg/kg		79.5		70 - 130	
	MSD	1316295-05	ND	0.10416	0.12500	mg/kg	4.7	83.3	20	70 - 130	
1,1-Dichloroethane	MS	1316295-05	ND	0.094120	0.12500	mg/kg		75.3		70 - 130	
	MSD	1316295-05	ND	0.10030	0.12500	mg/kg	6.4	80.2	20	70 - 130	
1,1-Dichloroethene	MS	1316295-05	ND	0.088420	0.12500	mg/kg		70.7		70 - 130	
	MSD	1316295-05	ND	0.092920	0.12500	mg/kg	5.0	74.3	20	70 - 130	
Toluene	MS	1316295-05	ND	0.093320	0.12500	mg/kg		74.7		70 - 130	
	MSD	1316295-05	ND	0.099100	0.12500	mg/kg	6.0	79.3	20	70 - 130	
Trichloroethene	MS	1316295-05	ND	0.092440	0.12500	mg/kg		74.0		70 - 130	
	MSD	1316295-05	ND	0.097520	0.12500	mg/kg	5.3	78.0	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	1316295-05	ND	0.051820	0.050000	mg/kg		104		70 - 121	
	MSD	1316295-05	ND	0.050530	0.050000	mg/kg	2.5	101		70 - 121	
Toluene-d8 (Surrogate)	MS	1316295-05	ND	0.049170	0.050000	mg/kg		98.3		81 - 117	
	MSD	1316295-05	ND	0.047870	0.050000	mg/kg	2.7	95.7		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	1316295-05	ND	0.049420	0.050000	mg/kg		98.8		74 - 121	
	MSD	1316295-05	ND	0.049280	0.050000	mg/kg	0.3	98.6		74 - 121	

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Project: Biosolids from MBWWTP
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Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH2241						
Acenaphthene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
Acenaphthylene	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Aldrin	BWH2241-BLK1	ND	mg/kg	0.10	0.024	
Aniline	BWH2241-BLK1	ND	mg/kg	0.20	0.053	
Anthracene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
Benzidine	BWH2241-BLK1	ND	mg/kg	3.0	0.22	
Benzo[a]anthracene	BWH2241-BLK1	ND	mg/kg	0.10	0.012	
Benzo[b]fluoranthene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
Benzo[k]fluoranthene	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Benzo[a]pyrene	BWH2241-BLK1	ND	mg/kg	0.10	0.015	
Benzo[g,h,i]perylene	BWH2241-BLK1	ND	mg/kg	0.10	0.056	
Benzoic acid	BWH2241-BLK1	ND	mg/kg	0.50	0.067	
Benzyl alcohol	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
Benzyl butyl phthalate	BWH2241-BLK1	ND	mg/kg	0.10	0.021	
alpha-BHC	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
beta-BHC	BWH2241-BLK1	ND	mg/kg	0.10	0.021	
delta-BHC	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
gamma-BHC (Lindane)	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
bis(2-Chloroethoxy)methane	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
bis(2-Chloroethyl) ether	BWH2241-BLK1	ND	mg/kg	0.10	0.016	
bis(2-Chloroisopropyl)ether	BWH2241-BLK1	ND	mg/kg	0.10	0.021	
bis(2-Ethylhexyl)phthalate	BWH2241-BLK1	ND	mg/kg	0.20	0.043	
4-Bromophenyl phenyl ether	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
4-Chloroaniline	BWH2241-BLK1	ND	mg/kg	0.10	0.027	
2-Chloronaphthalene	BWH2241-BLK1	ND	mg/kg	0.10	0.020	
4-Chlorophenyl phenyl ether	BWH2241-BLK1	ND	mg/kg	0.10	0.015	
Chrysene	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
4,4'-DDD	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
4,4'-DDE	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
4,4'-DDT	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Dibenzo[a,h]anthracene	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Dibenzofuran	BWH2241-BLK1	ND	mg/kg	0.10	0.020	
1,2-Dichlorobenzene	BWH2241-BLK1	ND	mg/kg	0.10	0.020	
1,3-Dichlorobenzene	BWH2241-BLK1	ND	mg/kg	0.10	0.021	

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Reported: 09/10/2013 13:11
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Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH2241						
1,4-Dichlorobenzene	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
3,3-Dichlorobenzidine	BWH2241-BLK1	ND	mg/kg	0.20	0.0067	
Dieldrin	BWH2241-BLK1	ND	mg/kg	0.10	0.031	
Diethyl phthalate	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Dimethyl phthalate	BWH2241-BLK1	ND	mg/kg	0.10	0.020	
Di-n-butyl phthalate	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
2,4-Dinitrotoluene	BWH2241-BLK1	ND	mg/kg	0.10	0.022	
2,6-Dinitrotoluene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
Di-n-octyl phthalate	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
1,2-Diphenylhydrazine	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Endosulfan I	BWH2241-BLK1	ND	mg/kg	0.20	0.020	
Endosulfan II	BWH2241-BLK1	ND	mg/kg	0.20	0.021	
Endosulfan sulfate	BWH2241-BLK1	ND	mg/kg	0.10	0.021	
Endrin	BWH2241-BLK1	ND	mg/kg	0.20	0.025	
Endrin aldehyde	BWH2241-BLK1	ND	mg/kg	0.50	0.022	
Fluoranthene	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
Fluorene	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Heptachlor	BWH2241-BLK1	ND	mg/kg	0.10	0.021	
Heptachlor epoxide	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
Hexachlorobenzene	BWH2241-BLK1	ND	mg/kg	0.10	0.016	
Hexachlorobutadiene	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
Hexachlorocyclopentadiene	BWH2241-BLK1	ND	mg/kg	0.10	0.019	
Hexachloroethane	BWH2241-BLK1	ND	mg/kg	0.10	0.020	
Indeno[1,2,3-cd]pyrene	BWH2241-BLK1	ND	mg/kg	0.10	0.072	
Isophorone	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
2-Methylnaphthalene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
Naphthalene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
2-Naphthylamine	BWH2241-BLK1	ND	mg/kg	3.0	0.16	
2-Nitroaniline	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
3-Nitroaniline	BWH2241-BLK1	ND	mg/kg	0.20	0.015	
4-Nitroaniline	BWH2241-BLK1	ND	mg/kg	0.20	0.025	
Nitrobenzene	BWH2241-BLK1	ND	mg/kg	0.10	0.015	
N-Nitrosodimethylamine	BWH2241-BLK1	ND	mg/kg	0.10	0.037	
N-Nitrosodi-N-propylamine	BWH2241-BLK1	ND	mg/kg	0.10	0.021	

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Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH2241						
N-Nitrosodiphenylamine	BWH2241-BLK1	ND	mg/kg	0.10	0.021	
Phenanthrene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
Pyrene	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
1,2,4-Trichlorobenzene	BWH2241-BLK1	ND	mg/kg	0.10	0.018	
4-Chloro-3-methylphenol	BWH2241-BLK1	ND	mg/kg	0.20	0.022	
2-Chlorophenol	BWH2241-BLK1	ND	mg/kg	0.10	0.016	
2,4-Dichlorophenol	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
2,4-Dimethylphenol	BWH2241-BLK1	ND	mg/kg	0.10	0.035	
4,6-Dinitro-2-methylphenol	BWH2241-BLK1	ND	mg/kg	0.50	0.012	
2,4-Dinitrophenol	BWH2241-BLK1	ND	mg/kg	0.50	0.0077	
2-Methylphenol	BWH2241-BLK1	ND	mg/kg	0.10	0.017	
3- & 4-Methylphenol	BWH2241-BLK1	ND	mg/kg	0.20	0.033	
2-Nitrophenol	BWH2241-BLK1	ND	mg/kg	0.10	0.016	
4-Nitrophenol	BWH2241-BLK1	ND	mg/kg	0.20	0.018	
Pentachlorophenol	BWH2241-BLK1	ND	mg/kg	0.20	0.013	
Phenol	BWH2241-BLK1	ND	mg/kg	0.10	0.016	
2,4,5-Trichlorophenol	BWH2241-BLK1	ND	mg/kg	0.20	0.018	
2,4,6-Trichlorophenol	BWH2241-BLK1	ND	mg/kg	0.20	0.017	
2-Fluorophenol (Surrogate)	BWH2241-BLK1	91.3	%	28 - 144 (LCL - UCL)		
Phenol-d5 (Surrogate)	BWH2241-BLK1	95.0	%	36 - 136 (LCL - UCL)		
Nitrobenzene-d5 (Surrogate)	BWH2241-BLK1	93.2	%	31 - 135 (LCL - UCL)		
2-Fluorobiphenyl (Surrogate)	BWH2241-BLK1	96.7	%	20 - 140 (LCL - UCL)		
2,4,6-Tribromophenol (Surrogate)	BWH2241-BLK1	102	%	20 - 150 (LCL - UCL)		
p-Terphenyl-d14 (Surrogate)	BWH2241-BLK1	74.7	%	30 - 150 (LCL - UCL)		

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWH2241										
Acenaphthene	BWH2241-BS1	LCS	1.6500	1.6835	mg/kg	98.0		50 - 140		
1,4-Dichlorobenzene	BWH2241-BS1	LCS	1.6470	1.6835	mg/kg	97.8		40 - 140		
2,4-Dinitrotoluene	BWH2241-BS1	LCS	1.6219	1.6835	mg/kg	96.3		40 - 140		
Hexachlorobenzene	BWH2241-BS1	LCS	1.7692	1.6835	mg/kg	105		46 - 140		
Hexachlorobutadiene	BWH2241-BS1	LCS	1.3985	1.6835	mg/kg	83.1		40 - 120		
Hexachloroethane	BWH2241-BS1	LCS	1.8018	1.6835	mg/kg	107		40 - 120		
Nitrobenzene	BWH2241-BS1	LCS	1.4766	1.6835	mg/kg	87.7		40 - 130		
N-Nitrosodi-N-propylamine	BWH2241-BS1	LCS	1.3609	1.6835	mg/kg	80.8		40 - 120		
Pyrene	BWH2241-BS1	LCS	1.4174	1.6835	mg/kg	84.2		40 - 150		
1,2,4-Trichlorobenzene	BWH2241-BS1	LCS	1.4821	1.6835	mg/kg	88.0		40 - 140		
4-Chloro-3-methylphenol	BWH2241-BS1	LCS	1.6830	1.6835	mg/kg	100		40 - 130		
2-Chlorophenol	BWH2241-BS1	LCS	1.5331	1.6835	mg/kg	91.1		40 - 130		
2-Methylphenol	BWH2241-BS1	LCS	1.5406	1.6835	mg/kg	91.5		40 - 140		
3- & 4-Methylphenol	BWH2241-BS1	LCS	3.1559	3.3670	mg/kg	93.7		40 - 120		
4-Nitrophenol	BWH2241-BS1	LCS	0.43144	1.6835	mg/kg	25.6		20 - 120		
Pentachlorophenol	BWH2241-BS1	LCS	0.83936	1.6835	mg/kg	49.9		20 - 130		
Phenol	BWH2241-BS1	LCS	1.5138	1.6835	mg/kg	89.9		40 - 120		
2,4,6-Trichlorophenol	BWH2241-BS1	LCS	1.3704	1.6835	mg/kg	81.4		44 - 130		
2-Fluorophenol (Surrogate)	BWH2241-BS1	LCS	2.3812	2.6936	mg/kg	88.4		28 - 144		
Phenol-d5 (Surrogate)	BWH2241-BS1	LCS	2.6314	2.6936	mg/kg	97.7		36 - 136		
Nitrobenzene-d5 (Surrogate)	BWH2241-BS1	LCS	2.6360	2.6936	mg/kg	97.9		31 - 135		
2-Fluorobiphenyl (Surrogate)	BWH2241-BS1	LCS	2.4854	2.6936	mg/kg	92.3		20 - 140		
2,4,6-Tribromophenol (Surrogate)	BWH2241-BS1	LCS	2.2715	2.6936	mg/kg	84.3		20 - 150		
p-Terphenyl-d14 (Surrogate)	BWH2241-BS1	LCS	1.0582	1.3468	mg/kg	78.6		30 - 150		

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Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH2241	Used client sample: N										
Acenaphthene	MS	1317997-01	ND	1.3500	1.6892	mg/kg		79.9		40 - 140	
	MSD	1317997-01	ND	1.4091	1.6667	mg/kg	4.3	84.5	30	40 - 140	
1,4-Dichlorobenzene	MS	1317997-01	ND	1.3236	1.6892	mg/kg		78.4		30 - 150	
	MSD	1317997-01	ND	1.3580	1.6667	mg/kg	2.6	81.5	30	30 - 150	
2,4-Dinitrotoluene	MS	1317997-01	ND	1.3348	1.6892	mg/kg		79.0		30 - 140	
	MSD	1317997-01	ND	1.4804	1.6667	mg/kg	10.3	88.8	30	30 - 140	
Hexachlorobenzene	MS	1317997-01	ND	1.4270	1.6892	mg/kg		84.5		30 - 150	
	MSD	1317997-01	ND	1.4048	1.6667	mg/kg	1.6	84.3	30	30 - 150	
Hexachlorobutadiene	MS	1317997-01	ND	1.0608	1.6892	mg/kg		62.8		20 - 140	
	MSD	1317997-01	ND	1.0504	1.6667	mg/kg	1.0	63.0	30	20 - 140	
Hexachloroethane	MS	1317997-01	ND	1.3287	1.6892	mg/kg		78.7		30 - 140	
	MSD	1317997-01	ND	1.4368	1.6667	mg/kg	7.8	86.2	30	30 - 140	
Nitrobenzene	MS	1317997-01	ND	1.2051	1.6892	mg/kg		71.3		30 - 140	
	MSD	1317997-01	ND	1.2788	1.6667	mg/kg	5.9	76.7	30	30 - 140	
N-Nitrosodi-N-propylamine	MS	1317997-01	ND	1.0517	1.6892	mg/kg		62.3		30 - 120	
	MSD	1317997-01	ND	1.1187	1.6667	mg/kg	6.2	67.1	30	30 - 120	
Pyrene	MS	1317997-01	ND	1.1497	1.6892	mg/kg		68.1		40 - 150	
	MSD	1317997-01	ND	1.2174	1.6667	mg/kg	5.7	73.0	30	40 - 150	
1,2,4-Trichlorobenzene	MS	1317997-01	ND	1.1493	1.6892	mg/kg		68.0		30 - 150	
	MSD	1317997-01	ND	1.1639	1.6667	mg/kg	1.3	69.8	30	30 - 150	
4-Chloro-3-methylphenol	MS	1317997-01	ND	1.4679	1.6892	mg/kg		86.9		40 - 130	
	MSD	1317997-01	ND	1.4048	1.6667	mg/kg	4.4	84.3	30	40 - 130	
2-Chlorophenol	MS	1317997-01	ND	1.2601	1.6892	mg/kg		74.6		40 - 130	
	MSD	1317997-01	ND	1.3566	1.6667	mg/kg	7.4	81.4	30	40 - 130	
2-Methylphenol	MS	1317997-01	ND	1.2997	1.6892	mg/kg		76.9		30 - 140	
	MSD	1317997-01	ND	1.3801	1.6667	mg/kg	6.0	82.8	30	30 - 140	
3- & 4-Methylphenol	MS	1317997-01	ND	2.5456	3.3784	mg/kg		75.4		40 - 130	
	MSD	1317997-01	ND	2.6347	3.3333	mg/kg	3.4	79.0	30	40 - 130	
4-Nitrophenol	MS	1317997-01	ND	0.49020	1.6892	mg/kg		29.0		20 - 140	
	MSD	1317997-01	ND	0.54945	1.6667	mg/kg	11.4	33.0	30	20 - 140	
Pentachlorophenol	MS	1317997-01	ND	1.2101	1.6892	mg/kg		71.6		20 - 130	
	MSD	1317997-01	ND	1.2467	1.6667	mg/kg	3.0	74.8	30	20 - 130	
Phenol	MS	1317997-01	ND	1.1834	1.6892	mg/kg		70.1		30 - 130	
	MSD	1317997-01	ND	1.3167	1.6667	mg/kg	10.7	79.0	30	30 - 130	
2,4,6-Trichlorophenol	MS	1317997-01	ND	1.3919	1.6892	mg/kg		82.4		40 - 140	
	MSD	1317997-01	ND	1.4530	1.6667	mg/kg	4.3	87.2	30	40 - 140	

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH2241	Used client sample: N										
2-Fluorophenol (Surrogate)	MS	1317997-01	ND	1.9831	2.7027	mg/kg		73.4		28 - 144	
	MSD	1317997-01	ND	2.1859	2.6667	mg/kg	9.7	82.0		28 - 144	
Phenol-d5 (Surrogate)	MS	1317997-01	ND	2.0608	2.7027	mg/kg		76.2		36 - 136	
	MSD	1317997-01	ND	2.3496	2.6667	mg/kg	13.1	88.1		36 - 136	
Nitrobenzene-d5 (Surrogate)	MS	1317997-01	ND	2.0760	2.7027	mg/kg		76.8		31 - 135	
	MSD	1317997-01	ND	2.3364	2.6667	mg/kg	11.8	87.6		31 - 135	
2-Fluorobiphenyl (Surrogate)	MS	1317997-01	ND	2.0443	2.7027	mg/kg		75.6		20 - 140	
	MSD	1317997-01	ND	2.1183	2.6667	mg/kg	3.6	79.4		20 - 140	
2,4,6-Tribromophenol (Surrogate)	MS	1317997-01	ND	2.2713	2.7027	mg/kg		84.0		20 - 150	
	MSD	1317997-01	ND	2.3780	2.6667	mg/kg	4.6	89.2		20 - 150	
p-Terphenyl-d14 (Surrogate)	MS	1317997-01	ND	0.91959	1.3514	mg/kg		68.0		30 - 150	
	MSD	1317997-01	ND	0.91476	1.3333	mg/kg	0.5	68.6		30 - 150	

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Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWI0160						
Oil and Grease	BWI0160-BLK1	ND	mg/kg	50	21	

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Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWI0160										
Oil and Grease	BWI0160-BS1	LCS	567.00	815.00	mg/kg	69.6		59 - 117		

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Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWI0160	Used client sample: Y - Description: Composite Biosoilds, 08/21/2013 09:50										
Oil and Grease	DUP	1317996-01	43605	37400		mg/kg	15.3		30		A09
	MS	1317996-01	43605	74400	4075.0	mg/kg		756		56 - 111	A09,Q03
	MSD	1317996-01	43605	44610	4075.0	mg/kg	50.1	24.7	30	56 - 111	A09,Q02,Q03

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Project Manager: Doug Coats

Chemical Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH1820						
Moisture	BWH1820-BLK1	ND	%	0.05	0.05	
QC Batch ID: BWH1954						
Ammonia as N	BWH1954-BLK1	ND	mg/kg	10	5.0	
QC Batch ID: BWH2083						
Total Kjeldahl Nitrogen	BWH2083-BLK1	ND	mg/kg	40	15	
QC Batch ID: BWH2084						
Total Phosphate	BWH2084-BLK1	ND	mg/kg	30	10	
QC Batch ID: BWH2161						
Nitrate as NO3	BWH2161-BLK1	ND	mg/kg	4.4	1.2	
QC Batch ID: BWH2320						
Total Cyanide	BWH2320-BLK1	ND	mg/kg	0.50	0.37	

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Project Manager: Doug Coats

Chemical Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWH1954										
Ammonia as N	BWH1954-BS1	LCS	100.69	100.00	mg/kg	101		80 - 120		
QC Batch ID: BWH2083										
Total Kjeldahl Nitrogen	BWH2083-BS1	LCS	392.30	400.00	mg/kg	98.1		85 - 115		
QC Batch ID: BWH2084										
Total Phosphate	BWH2084-BS1	LCS	622.19	613.20	mg/kg	101		85 - 115		
QC Batch ID: BWH2161										
Nitrate as NO3	BWH2161-BS1	LCS	22.581	22.134	mg/kg	102		90 - 110		
QC Batch ID: BWH2320										
Total Cyanide	BWH2320-BS1	LCS	9.6684	9.6154	mg/kg	101		80 - 120		
QC Batch ID: BWI0266										
pH	BWI0266-BS1	LCS	3.9810	4.0000	pH Units	99.5		95 - 105		

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Project Manager: Doug Coats

Chemical Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH1954	Used client sample: N										
Ammonia as N	DUP	1317510-12	2291.0	2343.5		mg/kg	2.3		20		
	MS	1317510-12	2291.0	2727.5	96.154	mg/kg		454		80 - 120	A03
	MSD	1317510-12	2291.0	2719.1	96.154	mg/kg	0.3	445	20	80 - 120	A03
QC Batch ID: BWH2083	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	1317469-01	27.070	29.040		mg/kg	7.0		20		
	MS	1317469-01	27.070	113.61	100.00	mg/kg		86.5		80 - 120	
	MSD	1317469-01	27.070	116.72	100.00	mg/kg	2.7	89.6	20	80 - 120	
QC Batch ID: BWH2084	Used client sample: N										
Total Phosphate	DUP	1317469-01	8.4934	7.5582		mg/kg	11.7		20		
	MS	1317469-01	8.4934	185.60	153.30	mg/kg		116		80 - 120	
	MSD	1317469-01	8.4934	167.45	153.30	mg/kg	10.3	104	20	80 - 120	
QC Batch ID: BWH2161	Used client sample: N										
Nitrate as NO3	DUP	1318187-07	2274.7	2259.7		mg/kg	0.7		20		
	MS	1318187-07	2274.7	3450.2	1117.9	mg/kg		105		80 - 120	
	MSD	1318187-07	2274.7	3446.4	1117.9	mg/kg	0.1	105	20	80 - 120	
QC Batch ID: BWH2304	Used client sample: N										
Solids	DUP	1317670-01	88.120	88.090		%	0.0		20		
QC Batch ID: BWH2320	Used client sample: Y - Description: Composite Biosoilds, 08/21/2013 09:50										
Total Cyanide	DUP	1317996-01	2.8462	2.8878		mg/kg	1.4		20		
	MS	1317996-01	2.8462	10.257	9.8039	mg/kg		75.6		80 - 120	Q03
	MSD	1317996-01	2.8462	10.153	9.8039	mg/kg	1.0	74.5	20	80 - 120	Q03
QC Batch ID: BWI0266	Used client sample: N										
pH	DUP	1318152-03	7.5490	7.5660		pH Units	0.2		20		

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Reported: 09/10/2013 13:11
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Modified WET Test (STLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH1514						
Total Dissolved Solids @ 180 C	BWH1514-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BWI0048						
Hexavalent Chromium	BWI0048-BLK1	ND	mg/L	0.20	0.070	

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Project Manager: Doug Coats

Modified WET Test (STLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWH1514										
Total Dissolved Solids @ 180 C	BWH1514-BS1	LCS	540.00	586.00	mg/L	92.2		90 - 110		
QC Batch ID: BWI0048										
Hexavalent Chromium	BWI0048-BS1	LCS	5.0543	5.0000	mg/L	101		85 - 115		

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Project Manager: Doug Coats

Modified WET Test (STLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH1514	Used client sample: Y - Description: Composite Biosoilds, 08/21/2013 09:50										
Total Dissolved Solids @ 180 C	DUP	1317996-01	4960.0	4860.0		mg/L	2.0		20		
QC Batch ID: BWI0048	Used client sample: Y - Description: Composite Biosoilds, 08/21/2013 09:50										
Hexavalent Chromium	DUP	1317996-01	ND	ND		mg/L			20		
	MS	1317996-01	ND	4.9438	5.2632	mg/L		93.9		85 - 115	
	MSD	1317996-01	ND	4.9272	5.2632	mg/L	0.3	93.6	20	85 - 115	

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Project Manager: Doug Coats

WET Test (STLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH2543						
Copper	BWH2543-BLK1	ND	mg/L	0.10	0.012	

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Project Manager: Doug Coats

WET Test (STLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWH2543										
Copper	BWH2543-BS1	LCS	19.207	20.000	mg/L	96.0		85 - 115		

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Project Manager: Doug Coats

WET Test (STLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH2543	Used client sample: Y - Description: Composite Biosoilds, 08/21/2013 09:50										
Copper	DUP	1317996-01	3.7510	3.7596		mg/L	0.2		20		
	MS	1317996-01	3.7510	23.618	20.408	mg/L		97.3		75 - 125	
	MSD	1317996-01	3.7510	23.325	20.408	mg/L	1.2	95.9	20	75 - 125	

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Project Manager: Doug Coats

Total Concentrations (TTLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWH2097						
Mercury	BWH2097-BLK1	0.037120	mg/kg	0.16	0.025	J
QC Batch ID: BWH2342						
Antimony	BWH2342-BLK1	ND	mg/kg	5.0	0.33	
Arsenic	BWH2342-BLK1	ND	mg/kg	1.0	0.40	
Barium	BWH2342-BLK1	ND	mg/kg	0.50	0.18	
Beryllium	BWH2342-BLK1	ND	mg/kg	0.50	0.047	
Cadmium	BWH2342-BLK1	ND	mg/kg	0.50	0.052	
Chromium	BWH2342-BLK1	ND	mg/kg	0.50	0.050	
Cobalt	BWH2342-BLK1	ND	mg/kg	2.5	0.098	
Copper	BWH2342-BLK1	ND	mg/kg	1.0	0.050	
Lead	BWH2342-BLK1	ND	mg/kg	2.5	0.28	
Molybdenum	BWH2342-BLK1	0.072355	mg/kg	2.5	0.050	J
Nickel	BWH2342-BLK1	ND	mg/kg	0.50	0.15	
Selenium	BWH2342-BLK1	ND	mg/kg	1.0	0.98	
Silver	BWH2342-BLK1	ND	mg/kg	0.50	0.067	
Thallium	BWH2342-BLK1	ND	mg/kg	5.0	0.64	
Vanadium	BWH2342-BLK1	ND	mg/kg	0.50	0.11	
Zinc	BWH2342-BLK1	ND	mg/kg	2.5	0.087	
Boron	BWH2342-BLK1	ND	mg/kg	5.0	0.50	
QC Batch ID: BWH2360						
Total Hexavalent Chromium	BWH2360-BLK1	ND	mg/kg	1.0	0.41	

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Total Concentrations (TTLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BWH2097										
Mercury	BWH2097-BS1	LCS	0.85952	0.80000	mg/kg	107		80 - 120		
QC Batch ID: BWH2342										
Antimony	BWH2342-BS1	LCS	83.102	100.00	mg/kg	83.1		75 - 125		
Arsenic	BWH2342-BS1	LCS	8.4594	10.000	mg/kg	84.6		75 - 125		
Barium	BWH2342-BS1	LCS	91.900	100.00	mg/kg	91.9		75 - 125		
Beryllium	BWH2342-BS1	LCS	8.8757	10.000	mg/kg	88.8		75 - 125		
Cadmium	BWH2342-BS1	LCS	8.9524	10.000	mg/kg	89.5		75 - 125		
Chromium	BWH2342-BS1	LCS	90.398	100.00	mg/kg	90.4		75 - 125		
Cobalt	BWH2342-BS1	LCS	92.572	100.00	mg/kg	92.6		75 - 125		
Copper	BWH2342-BS1	LCS	88.813	100.00	mg/kg	88.8		75 - 125		
Lead	BWH2342-BS1	LCS	93.525	100.00	mg/kg	93.5		75 - 125		
Molybdenum	BWH2342-BS1	LCS	90.504	100.00	mg/kg	90.5		75 - 125		
Nickel	BWH2342-BS1	LCS	92.454	100.00	mg/kg	92.5		75 - 125		
Selenium	BWH2342-BS1	LCS	8.9050	10.000	mg/kg	89.1		75 - 125		
Silver	BWH2342-BS1	LCS	8.8699	10.000	mg/kg	88.7		75 - 125		
Thallium	BWH2342-BS1	LCS	93.358	100.00	mg/kg	93.4		75 - 125		
Vanadium	BWH2342-BS1	LCS	91.013	100.00	mg/kg	91.0		75 - 125		
Zinc	BWH2342-BS1	LCS	91.252	100.00	mg/kg	91.3		75 - 125		
Boron	BWH2342-BS1	LCS	85.522	100.00	mg/kg	85.5		75 - 125		
QC Batch ID: BWH2360										
Total Hexavalent Chromium	BWH2360-BS1	LCS	40.022	40.000	mg/kg	100		80 - 120		

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Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH2097	Used client sample: N										
Mercury	DUP	1318044-01	0.034355	0.046129		mg/kg	29.3		20		J,A02
	MS	1318044-01	0.034355	0.77290	0.80645	mg/kg		91.6		80 - 120	
	MSD	1318044-01	0.034355	0.84613	0.80645	mg/kg	9.0	101	20	80 - 120	
QC Batch ID: BWH2342	Used client sample: N										
Antimony	DUP	1318167-04	ND	ND		mg/kg			20		
	MS	1318167-04	ND	22.057	99.010	mg/kg		22.3		16 - 119	
	MSD	1318167-04	ND	22.745	99.010	mg/kg	3.1	23.0	20	16 - 119	
Arsenic	DUP	1318167-04	5.8464	6.5260		mg/kg	11.0		20		
	MS	1318167-04	5.8464	15.176	9.9010	mg/kg		94.2		75 - 125	
	MSD	1318167-04	5.8464	14.850	9.9010	mg/kg	2.2	90.9	20	75 - 125	
Barium	DUP	1318167-04	166.12	172.90		mg/kg	4.0		20		
	MS	1318167-04	166.12	263.15	99.010	mg/kg		98.0		75 - 125	
	MSD	1318167-04	166.12	264.83	99.010	mg/kg	0.6	99.7	20	75 - 125	
Beryllium	DUP	1318167-04	0.33948	0.33902		mg/kg	0.1		20		J
	MS	1318167-04	0.33948	8.8641	9.9010	mg/kg		86.1		75 - 125	
	MSD	1318167-04	0.33948	8.8211	9.9010	mg/kg	0.5	85.7	20	75 - 125	
Cadmium	DUP	1318167-04	1.4186	1.4429		mg/kg	1.7		20		
	MS	1318167-04	1.4186	10.014	9.9010	mg/kg		86.8		75 - 125	
	MSD	1318167-04	1.4186	10.123	9.9010	mg/kg	1.1	87.9	20	75 - 125	
Chromium	DUP	1318167-04	24.425	24.392		mg/kg	0.1		20		
	MS	1318167-04	24.425	110.10	99.010	mg/kg		86.5		75 - 125	
	MSD	1318167-04	24.425	109.83	99.010	mg/kg	0.2	86.3	20	75 - 125	
Cobalt	DUP	1318167-04	5.0088	5.0518		mg/kg	0.9		20		
	MS	1318167-04	5.0088	89.534	99.010	mg/kg		85.4		75 - 125	
	MSD	1318167-04	5.0088	89.182	99.010	mg/kg	0.4	85.0	20	75 - 125	
Copper	DUP	1318167-04	23.538	22.935		mg/kg	2.6		20		
	MS	1318167-04	23.538	107.52	99.010	mg/kg		84.8		75 - 125	
	MSD	1318167-04	23.538	106.87	99.010	mg/kg	0.6	84.2	20	75 - 125	
Lead	DUP	1318167-04	10.416	9.9552		mg/kg	4.5		20		
	MS	1318167-04	10.416	95.123	99.010	mg/kg		85.6		75 - 125	
	MSD	1318167-04	10.416	94.951	99.010	mg/kg	0.2	85.4	20	75 - 125	
Molybdenum	DUP	1318167-04	4.2877	4.3755		mg/kg	2.0		20		
	MS	1318167-04	4.2877	82.259	99.010	mg/kg		78.8		75 - 125	
	MSD	1318167-04	4.2877	83.527	99.010	mg/kg	1.5	80.0	20	75 - 125	
Nickel	DUP	1318167-04	29.789	29.964		mg/kg	0.6		20		
	MS	1318167-04	29.789	114.86	99.010	mg/kg		85.9		75 - 125	
	MSD	1318167-04	29.789	114.49	99.010	mg/kg	0.3	85.5	20	75 - 125	

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Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BWH2342	Used client sample: N										
Selenium	DUP	1318167-04	5.5273	4.7887		mg/kg	14.3		20		
	MS	1318167-04	5.5273	11.329	9.9010	mg/kg		58.6		75 - 125	Q03
	MSD	1318167-04	5.5273	12.141	9.9010	mg/kg	6.9	66.8	20	75 - 125	Q03
Silver	DUP	1318167-04	0.073158	0.068135		mg/kg	7.1		20		J
	MS	1318167-04	0.073158	8.7865	9.9010	mg/kg		88.0		75 - 125	
	MSD	1318167-04	0.073158	8.7250	9.9010	mg/kg	0.7	87.4	20	75 - 125	
Thallium	DUP	1318167-04	ND	ND		mg/kg			20		
	MS	1318167-04	ND	84.371	99.010	mg/kg		85.2		75 - 125	
	MSD	1318167-04	ND	86.228	99.010	mg/kg	2.2	87.1	20	75 - 125	
Vanadium	DUP	1318167-04	35.200	35.422		mg/kg	0.6		20		
	MS	1318167-04	35.200	122.63	99.010	mg/kg		88.3		75 - 125	
	MSD	1318167-04	35.200	122.25	99.010	mg/kg	0.3	87.9	20	75 - 125	
Zinc	DUP	1318167-04	58.644	58.701		mg/kg	0.1		20		
	MS	1318167-04	58.644	142.37	99.010	mg/kg		84.6		75 - 125	
	MSD	1318167-04	58.644	141.22	99.010	mg/kg	0.8	83.4	20	75 - 125	
Boron	DUP	1318167-04	16.251	16.431		mg/kg	1.1		20		
	MS	1318167-04	16.251	91.424	99.010	mg/kg		75.9		75 - 125	
	MSD	1318167-04	16.251	90.454	99.010	mg/kg	1.1	74.9	20	75 - 125	Q03
QC Batch ID: BWH2360	Used client sample: N										
Total Hexavalent Chromium	DUP	1318058-03	17.144	17.850		mg/kg	4.0		20		
	MS	1318058-03	17.144	56.942	40.000	mg/kg		99.5		75 - 125	
	MSD	1318058-03	17.144	56.928	40.000	mg/kg	0.0	99.5	20	75 - 125	

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Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.
A09	PQL's were raised due to high concentration of target analytes requiring sample dilution.
A10	PQL's and MDL's were raised due to matrix interference.
A19	Surrogate is high due to matrix interference. Interferences verified through second extraction/analysis.
pH1:3	pH result reported on a 1:3 dilution of sample
Q02	Matrix spike precision is not within the control limits.
Q03	Matrix spike recovery(s) is(are) not within the control limits.
S08	The internal standard on the sample was not within the control limits.
S09	The surrogate recovery on the sample for this compound was not within the control limits.