City of Morro Bay and
Cayucos Sanitary District

OFFSHORE MONITORING AND REPORTING PROGRAM

RESIDUAL BIOSOLIDS CHEMICAL ANALYSIS RESULTS

JULY 2014

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

July 2014

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

August 2014

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 8-11-14

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

11August 2014

Reference: Chemical Analysis Results for Biosolid Samples Collected in July 2014

Dear Mr. Keogh:

Enclosed are the results of chemical analyses conducted on a representative composite of biosolid samples collected from the drying beds on 16 July 2014. 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 2014 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 July-2014 sample were comparable to concentrations measured in samples collected annually from 1999 through 2013.[a]

All trace-metal concentrations measured in the July-2014 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 seven 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 July-2014 sample was comparable to concentrations measured in biosolids samples collected historically.

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

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 [c]**	**WET [d]**	**STLC [e]**	**TTLC [f]**	**Bulk**	**Monthly [g]**	**Ceiling [h]**
Solids	%	71.2	—[i]	—	—	—	—	—
Total Dissolved Solids	ppm	—	6,400.	—	—	—	—	—
Cyanide	ppm	4.1	—	—	—	5.8	—	—
Antimony	ppm	6.6	—	15.	500.	9.2	—	—
Arsenic	ppm	3.0	—	5.	500.	4.2	41.	75.
Barium	ppm	320.	—	100.	10,000.	440.	—	—
Beryllium	ppm	≈0.11[j]	—	0.75	75.	≈0.15	—	—
Boron	ppm	13.	—	—	—	18.	—	—
Cadmium	ppm	2.2	—	1.	100.	3.1	39.	85.
Chromium (Total)	ppm	35.	—	560.	2,500.	49.	—	—
Chromium (Hexavalent)	ppm	ND[k]	ND	5.	500.	ND	—	—
Cobalt	ppm	2.6	—	80.	8,000.	3.6	1,500.	4,300.
Copper	ppm	410.[l]	3.8	25.	2,500.	580.	1,500.	4,300.
Lead	ppm	25.	—	5.	1,000.	36.	300.	840.
Mercury	ppm	0.42	—	0.2	20.	0.60	17.	57.
Molybdenum	ppm	15.	—	350.	3,500.	21.	—	—
Nickel	ppm	30.	—	20.	2,000.	42.	420.	420.
Selenium	ppm	4.3	—	1.	100.	6.0	100.	100.
Silver	ppm	3.4	—	5.	500.	4.7	—	—
Thallium	ppm	≈1.3	—	7.	700.	≈1.9	—	—
Vanadium	ppm	19.	—	24.	2,400.	27.	—	—
Zinc	ppm	840.	—	250.	5,000.	1,200.	2,800.	7,500.
Hydrogen-Ion	pH	6.34	—	—	—	—	—	—
Phosphate	mg/kg	54,000.	—	—	—	76,000.	—	—
Ammonia	mg/kg	5,300.	—	—	—	7,400.	—	—
TKN	mg/kg	20,000.	—	—	—	28,000.	—	—
Organic Nitrogen[m]	mg/kg	14,700.	—	—	—	20,600.	—	—
Nitrate as NO_3	mg/kg	4,300.	—	—	—	6,100.	—	—
Oil & Grease	ppm	46,000.	—	—	—	64,000.	—	—

[a] Marine Research Specialists (MRS). 1999 through 2013. 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?AMID=64

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

[d] 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.

[e] 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*.

[f] 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.*

[g] 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)].

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

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

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

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

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

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

Date of Report: 08/11/2014

Doug Coats

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

Client Project: [none]
BCL Project: Biosolids from MBWWTP
BCL Work Order: 1416060
Invoice ID: B180121

Enclosed are the results of analyses for samples received by the laboratory on 7/16/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

Table of Contents

Case Narratives

Case Narrative for Work Order 1416060

2- CEVE can only be reported as a TIC (Tentatively Identified Compound). 2-CEVE was not found as a TIC for lab 14-16060

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	David Bierman	
Work Order# 14-16060	George Helms	

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	Soil	Sludge	Drinking Water	Ground water	Waste Water	Other	Notes
1	Composite Biosolids	7/16/14	0900	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓					

Comments:
page 1 of 2

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

Sample Matrix

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

CHK BY: MW | DISTRIBUTION: MARTINEZ/SELM ☐ | 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

Relinquished By	Date	Time	Received By	Date	Time
1. [signature]	7-16-14	1329	1. [signature]	7-16-14	1329
2. [signature]	7-16-14	1910	2. [signature]	7/16/14	1910
3.			3.		

BC Laboratories, Inc. – 4100 Atlas Court Bakersfield, Ca. 93308 661.327-4911 Fax: 661.327-1918

Page 1 of 2

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	David Bierman
Work Order# 14-16060	George Helms

Analysis Requested

Sample #	Description	Date Sampled	Time Sampled	Oil and Grease, EPA 1664	Semi-vol organics, EPA 8270	Pesticides/PCBs, EPA 8080	Volatile organics, EPA 8240	Total Hex Chrom, EPA 7196	Hex Chrom, mod. STLC 7196	WET tests*** on Pb and Cu			Sample Matrix: Soil	Sludge	Drinking Water	Ground water	Waste Water	Other	Notes
1	Composite Biosolids (cont'd from pg 1)	7/16/14		✓	✓	✓	✓	✓	✓	✓				✓					***STLC EPA 6010, but see notes on PDF!

Comments:
page 2 of 2

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

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

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
		7-16-14	1329		7-16-14	1326
	2. Relinquished By	Date	Time	2. Relinquished By	Date	Time
		7-16-14	1910		7-16-14	1910
	3. Relinquished By	Date	Time	3. Relinquished By	Date	Time

Chain of Custody and Cooler Receipt Form for 1416060 Page 3 of 5

BC LABORATORIES INC. **COOLER RECEIPT FORM** Rev. No. 17 06/05/14 Page 1 Of 1

Submission #: 14-16060

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: 0.98 Container: Glass Thermometer ID: 207
Temperature: (A) 0.6 °C / (C) 0.7 °C

Date/Time 7/16/14 1910
Analyst Init MWL

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR	ABCDEFG									
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: MWL Date/Time: 7/16/14 @ 2005 S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC16

Page 1 of 2

14-16060

Analysis and Reporting for the Biosolids Sample from the Morro Bay Wastewater Treatment Plant to be collected on 16 July 2014[a]

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

Chain of Custody and Cooler Receipt Form for 1416060 Page 5 of 5

Page 2 of 2

14-16060

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

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

Reported: 08/11/2014 15:54
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1416060-01	**COC Number:**	---	**Receive Date:**	07/16/2014 19:10
	Project Number:	---	**Sampling Date:**	07/16/2014 09:00
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	Composite Biosolids	**Lab Matrix:**	Solids
	Sampled By:	---	**Sample Type:**	Solid waste

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

Reported: 08/11/2014 15:54
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Aldrin	ND	ND	mg/kg	0.075	0.0039	EPA-8080	ND	A10	1
alpha-BHC	ND	ND	mg/kg	0.075	0.021	EPA-8080	ND	A10	1
beta-BHC	ND	ND	mg/kg	0.075	0.057	EPA-8080	ND	A10	1
delta-BHC	ND	ND	mg/kg	0.075	0.011	EPA-8080	ND	A10	1
gamma-BHC (Lindane)	ND	ND	mg/kg	0.075	0.038	EPA-8080	ND	A10	1
Chlordane (Technical)	ND	ND	mg/kg	7.5	2.2	EPA-8080	ND	A10	1
4,4'-DDD	ND	ND	mg/kg	0.075	0.0094	EPA-8080	ND	A10	1
4,4'-DDE	ND	ND	mg/kg	0.075	0.0068	EPA-8080	ND	A10	1
4,4'-DDT	ND	ND	mg/kg	0.075	0.0046	EPA-8080	ND	A10	1
Dieldrin	ND	ND	mg/kg	0.075	0.0048	EPA-8080	ND	A10	1
Endosulfan I	ND	ND	mg/kg	0.075	0.013	EPA-8080	ND	A10	1
Endosulfan II	ND	ND	mg/kg	0.075	0.0099	EPA-8080	ND	A10	1
Endosulfan sulfate	ND	ND	mg/kg	0.075	0.020	EPA-8080	ND	A10	1
Endrin	ND	ND	mg/kg	0.075	0.0052	EPA-8080	ND	A10	1
Endrin aldehyde	ND	ND	mg/kg	0.075	0.0092	EPA-8080	ND	A10	1
Heptachlor	ND	ND	mg/kg	0.075	0.039	EPA-8080	ND	A10	1
Heptachlor epoxide	ND	ND	mg/kg	0.075	0.022	EPA-8080	ND	A10	1
Methoxychlor	ND	ND	mg/kg	0.075	0.020	EPA-8080	ND	A10	1
Toxaphene	ND	ND	mg/kg	7.5	1.1	EPA-8080	ND	A10	1
PCB-1016	ND	ND	mg/kg	1.5	0.40	EPA-8080	ND	A10	1
PCB-1221	ND	ND	mg/kg	1.5	0.57	EPA-8080	ND	A10	1
PCB-1232	ND	ND	mg/kg	1.5	0.36	EPA-8080	ND	A10	1
PCB-1242	ND	ND	mg/kg	1.5	0.60	EPA-8080	ND	A10	1
PCB-1248	ND	ND	mg/kg	1.5	0.39	EPA-8080	ND	A10	1
PCB-1254	ND	ND	mg/kg	1.5	0.48	EPA-8080	ND	A10	1
PCB-1260	ND	ND	mg/kg	1.5	0.24	EPA-8080	ND	A10	1
Total PCB's (Summation)	ND	ND	mg/kg	1.5	0.75	EPA-8080	ND	A10	1
TCMX (Surrogate)	74.5	74.5	%	20 - 140 (LCL - UCL)		EPA-8080		A10	1
Decachlorobiphenyl (Surrogate)	165	165	%	20 - 140 (LCL - UCL)		EPA-8080		S09	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8080	07/23/14	08/08/14 02:06	VH1	GC-14	150	BXG2252

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

Reported: 08/11/2014 15:54
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

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	A01	1
Bromodichloromethane	ND	ND	mg/kg	0.010	0.0017	EPA-8240	ND	A01	1
Bromoform	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A01	1
Bromomethane	ND	ND	mg/kg	0.010	0.0032	EPA-8240	ND	A01	1
Carbon tetrachloride	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A01	1
Chlorobenzene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A01	1
Chloroethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A01	1
Chloroform	ND	ND	mg/kg	0.010	0.0013	EPA-8240	ND	A01	1
Chloromethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A01	1
Dibromochloromethane	ND	ND	mg/kg	0.010	0.0020	EPA-8240	ND	A01	1
1,2-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0016	EPA-8240	ND	A01	1
1,3-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A01	1
1,4-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A01	1
1,1-Dichloroethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A01	1
1,2-Dichloroethane	ND	ND	mg/kg	0.010	0.0017	EPA-8240	ND	A01	1
1,1-Dichloroethene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A01	1
trans-1,2-Dichloroethene	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A01	1
1,2-Dichloropropane	ND	ND	mg/kg	0.010	0.0016	EPA-8240	ND	A01	1
cis-1,3-Dichloropropene	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A01	1
trans-1,3-Dichloropropene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A01	1
Ethylbenzene	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A01	1
Methylene chloride	ND	ND	mg/kg	0.020	0.0048	EPA-8240	ND	A01	1
Methyl t-butyl ether	ND	ND	mg/kg	0.010	0.0010	EPA-8240	ND	A01	1
1,1,2,2-Tetrachloroethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A01	1
Tetrachloroethene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A01	1
Toluene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A01	1
1,1,1-Trichloroethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A01	1
1,1,2-Trichloroethane	ND	ND	mg/kg	0.010	0.0015	EPA-8240	ND	A01	1
Trichloroethene	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A01	1
Trichlorofluoromethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A01	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A01	1
Vinyl chloride	ND	ND	mg/kg	0.010	0.0032	EPA-8240	ND	A01	1

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

Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

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	A01	1
Acrolein	ND	ND	mg/kg	0.10	0.015	EPA-8240	ND	A01	1
Acrylonitrile	ND	ND	mg/kg	0.040	0.0094	EPA-8240	ND	A01	1
1,2-Dichloroethane-d4 (Surrogate)	104	104	%	70 - 121 (LCL - UCL)		EPA-8240			1
Toluene-d8 (Surrogate)	94.1	94.1	%	81 - 117 (LCL - UCL)		EPA-8240			1
4-Bromofluorobenzene (Surrogate)	91.1	91.1	%	74 - 121 (LCL - UCL)		EPA-8240			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8240	07/16/14	07/17/14 12:00	ADC	MS-V2	2	BXG1155

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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)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
Acenaphthylene	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Aldrin	ND	ND	mg/kg	29	7.0	EPA-8270C	ND		1
Aniline	ND	ND	mg/kg	58	15	EPA-8270C	ND		1
Anthracene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
Benzidine	ND	ND	mg/kg	870	64	EPA-8270C	ND		1
Benzo[a]anthracene	ND	ND	mg/kg	29	3.5	EPA-8270C	ND		1
Benzo[b]fluoranthene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
Benzo[k]fluoranthene	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Benzo[a]pyrene	ND	ND	mg/kg	29	4.4	EPA-8270C	ND		1
Benzo[g,h,i]perylene	ND	ND	mg/kg	29	16	EPA-8270C	ND		1
Benzoic acid	ND	ND	mg/kg	150	19	EPA-8270C	ND		1
Benzyl alcohol	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
Benzyl butyl phthalate	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
alpha-BHC	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
beta-BHC	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
delta-BHC	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
gamma-BHC (Lindane)	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
bis(2-Chloroethoxy)methane	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
bis(2-Chloroethyl) ether	ND	ND	mg/kg	29	4.7	EPA-8270C	ND		1
bis(2-Chloroisopropyl)ether	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
bis(2-Ethylhexyl)phthalate	37	26	**mg/kg**	**58**	**13**	**EPA-8270C**	ND	**J**	1
4-Bromophenyl phenyl ether	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
4-Chloroaniline	ND	ND	mg/kg	29	7.9	EPA-8270C	ND		1
2-Chloronaphthalene	ND	ND	mg/kg	29	5.8	EPA-8270C	ND		1
4-Chlorophenyl phenyl ether	ND	ND	mg/kg	29	4.4	EPA-8270C	ND		1
Chrysene	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
4,4'-DDD	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
4,4'-DDE	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
4,4'-DDT	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Dibenzo[a,h]anthracene	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Dibenzofuran	ND	ND	mg/kg	29	5.8	EPA-8270C	ND		1

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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)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
1,2-Dichlorobenzene	ND	ND	mg/kg	29	5.8	EPA-8270C	ND		1
1,3-Dichlorobenzene	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
1,4-Dichlorobenzene	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
3,3-Dichlorobenzidine	ND	ND	mg/kg	58	1.9	EPA-8270C	ND		1
Dieldrin	ND	ND	mg/kg	29	9.0	EPA-8270C	ND		1
Diethyl phthalate	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Dimethyl phthalate	ND	ND	mg/kg	29	5.8	EPA-8270C	ND		1
Di-n-butyl phthalate	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
2,4-Dinitrotoluene	ND	ND	mg/kg	29	6.4	EPA-8270C	ND		1
2,6-Dinitrotoluene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
Di-n-octyl phthalate	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
1,2-Diphenylhydrazine	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Endosulfan I	ND	ND	mg/kg	58	5.8	EPA-8270C	ND		1
Endosulfan II	ND	ND	mg/kg	58	6.1	EPA-8270C	ND		1
Endosulfan sulfate	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
Endrin	ND	ND	mg/kg	58	7.3	EPA-8270C	ND		1
Endrin aldehyde	ND	ND	mg/kg	150	6.4	EPA-8270C	ND		1
Fluoranthene	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
Fluorene	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Heptachlor	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
Heptachlor epoxide	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
Hexachlorobenzene	ND	ND	mg/kg	29	4.7	EPA-8270C	ND		1
Hexachlorobutadiene	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
Hexachlorocyclopentadiene	ND	ND	mg/kg	29	5.5	EPA-8270C	ND		1
Hexachloroethane	ND	ND	mg/kg	29	5.8	EPA-8270C	ND		1
Indeno[1,2,3-cd]pyrene	ND	ND	mg/kg	29	21	EPA-8270C	ND		1
Isophorone	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
2-Methylnaphthalene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
Naphthalene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
2-Naphthylamine	ND	ND	mg/kg	870	47	EPA-8270C	ND		1
2-Nitroaniline	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
3-Nitroaniline	ND	ND	mg/kg	58	4.4	EPA-8270C	ND		1

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Reported: 08/11/2014 15:54
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
4-Nitroaniline	ND	ND	mg/kg	58	7.3	EPA-8270C	ND		1
Nitrobenzene	ND	ND	mg/kg	29	4.4	EPA-8270C	ND		1
N-Nitrosodimethylamine	ND	ND	mg/kg	29	11	EPA-8270C	ND		1
N-Nitrosodi-N-propylamine	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
N-Nitrosodiphenylamine	ND	ND	mg/kg	29	6.1	EPA-8270C	ND		1
Phenanthrene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
Pyrene	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
1,2,4-Trichlorobenzene	ND	ND	mg/kg	29	5.2	EPA-8270C	ND		1
4-Chloro-3-methylphenol	ND	ND	mg/kg	58	6.4	EPA-8270C	ND		1
2-Chlorophenol	ND	ND	mg/kg	29	4.7	EPA-8270C	ND		1
2,4-Dichlorophenol	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
2,4-Dimethylphenol	ND	ND	mg/kg	29	10	EPA-8270C	ND		1
4,6-Dinitro-2-methylphenol	ND	ND	mg/kg	150	3.5	EPA-8270C	ND		1
2,4-Dinitrophenol	ND	ND	mg/kg	150	2.2	EPA-8270C	ND		1
2-Methylphenol	ND	ND	mg/kg	29	4.9	EPA-8270C	ND		1
3- & 4-Methylphenol	ND	ND	mg/kg	58	9.6	EPA-8270C	ND		1
2-Nitrophenol	ND	ND	mg/kg	29	4.7	EPA-8270C	ND		1
4-Nitrophenol	ND	ND	mg/kg	58	5.2	EPA-8270C	ND		1
Pentachlorophenol	ND	ND	mg/kg	58	3.8	EPA-8270C	ND		1
Phenol	ND	ND	mg/kg	29	4.7	EPA-8270C	ND		1
2,4,5-Trichlorophenol	ND	ND	mg/kg	58	5.2	EPA-8270C	ND		1
2,4,6-Trichlorophenol	ND	ND	mg/kg	58	4.9	EPA-8270C	ND		1
2-Fluorophenol (Surrogate)	74.1	74.1	%	28 - 144 (LCL - UCL)		EPA-8270C			1
Phenol-d5 (Surrogate)	82.8	82.8	%	36 - 136 (LCL - UCL)		EPA-8270C			1
Nitrobenzene-d5 (Surrogate)	87.4	87.4	%	31 - 135 (LCL - UCL)		EPA-8270C			1
2-Fluorobiphenyl (Surrogate)	88.0	88.0	%	20 - 140 (LCL - UCL)		EPA-8270C			1
2,4,6-Tribromophenol (Surrogate)	92.3	92.3	%	20 - 150 (LCL - UCL)		EPA-8270C			1
p-Terphenyl-d14 (Surrogate)	135	135	%	30 - 150 (LCL - UCL)		EPA-8270C			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8270C	07/23/14	07/24/14 23:54	VH1	MS-B2	291	BXG2138

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Project Manager: Doug Coats

EPA Method 1664

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	64000	46000	**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	07/18/14	07/18/14 14:00	JAK	MAN-SV	5	BXG1769

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

Chemical Analysis

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Moisture	0	28.8	**%**	**0.05**	**0.05**	**Calc**	ND		1
Total Cyanide	5.8	4.1	**mg/kg**	**0.50**	**0.37**	**EPA-9012**	ND		2
pH	6.34	6.34	**pH Units**	**0.05**	**0.05**	**EPA-9045D**		**pH1:1**	3
pH Measurement Temperature	25.0	25.0	**C**	**0.1**	**0.1**	**EPA-9045D**			3
Nitrate as NO3	6100	4300	**mg/kg**	**44**	**12**	**EPA-300.0**	ND	**A01**	4
Total Kjeldahl Nitrogen	28000	20000	**mg/kg**	**2000**	**800**	**EPA-351.2**	ND	**A01**	5
Ammonia as N	7400	5300	**mg/kg**	**500**	**250**	**EPA-350.1**	ND	**A01**	6
Total Phosphate	76000	54000	**mg/kg**	**1500**	**650**	**EPA-365.4**	ND	**A01**	7
Solids	100	71.2	**%**	**0.05**	**0.05**	**SM-2540G**			8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	Calc	07/18/14	07/30/14 14:04	TMS	Calc	1	BXG1620
2	EPA-9012	07/24/14	07/25/14 10:09	TDC	KONE-1	0.980	BXG2204
3	EPA-9045D	07/18/14	07/18/14 12:45	DIW	MANUAL	1	BXG1727
4	EPA-300.0	07/29/14	07/30/14 18:49	OLH	IC2	10	BXG2540
5	EPA-351.2	07/28/14	07/29/14 11:36	JP1	SC-1	50	BXG2400
6	EPA-350.1	07/24/14	07/28/14 12:33	JP1	SC-1	50	BXG2206
7	EPA-365.4	07/28/14	07/29/14 10:07	JP1	SC-1	50	BXG2401
8	SM-2540G	07/21/14	07/21/14 15:35	RAC	MANUAL	1	BXG1906

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

Modified WET Test (STLC)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

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		6400	**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	07/21/14	07/21/14 11:12	TDC	KONE-1	1	BXG1775
2	EPA-160.1	07/21/14	07/21/14 15:00	CAD	MANUAL	20	BXG1838

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Reported: 08/11/2014 15:54
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

WET Test (STLC)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

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**	0.023		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	07/20/14	07/22/14 09:54	ARD	PE-OP1	1	BXG1820

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Reported: 08/11/2014 15:54
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Total Concentrations (TTLC)

BCL Sample ID: 1416060-01 | **Client Sample Name:** Composite Biosolids, 7/16/2014 9:00:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Antimony	9.2	6.6	**mg/kg**	**5.0**	**0.33**	**EPA-6010B**	ND		1
Arsenic	4.2	3.0	**mg/kg**	**1.0**	**0.40**	**EPA-6010B**	0.76		1
Barium	440	320	**mg/kg**	**0.50**	**0.18**	**EPA-6010B**	ND		1
Beryllium	0.15	0.11	**mg/kg**	**0.50**	**0.047**	**EPA-6010B**	ND	**J**	1
Cadmium	3.1	2.2	**mg/kg**	**0.50**	**0.052**	**EPA-6010B**	ND		1
Chromium	49	35	**mg/kg**	**0.50**	**0.050**	**EPA-6010B**	ND		1
Total Hexavalent Chromium	ND	ND	mg/kg	5.0	0.75	EPA-7199	0.78	A10	2
Cobalt	3.6	2.6	**mg/kg**	**2.5**	**0.098**	**EPA-6010B**	ND		1
Copper	580	410	**mg/kg**	**1.0**	**0.050**	**EPA-6010B**	ND		1
Lead	36	25	**mg/kg**	**2.5**	**0.28**	**EPA-6010B**	ND		1
Mercury	0.60	0.42	**mg/kg**	**0.16**	**0.036**	**EPA-7471A**	ND		3
Molybdenum	21	15	**mg/kg**	**2.5**	**0.050**	**EPA-6010B**	ND		1
Nickel	42	30	**mg/kg**	**0.50**	**0.15**	**EPA-6010B**	ND		1
Selenium	6.0	4.3	**mg/kg**	**1.0**	**0.98**	**EPA-6010B**	ND		1
Silver	4.7	3.4	**mg/kg**	**0.50**	**0.067**	**EPA-6010B**	ND		1
Thallium	1.9	1.3	**mg/kg**	**5.0**	**0.64**	**EPA-6010B**	ND	**J**	1
Vanadium	27	19	**mg/kg**	**0.50**	**0.11**	**EPA-6010B**	0.24		1
Zinc	1200	840	**mg/kg**	**2.5**	**0.087**	**EPA-6010B**	0.27		1
Boron	18	13	**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	07/18/14	07/21/14 11:12	ARD	PE-OP1	0.952	BXG1659
2	EPA-7199	07/21/14	07/23/14 16:37	OLH	IC-4	5	BXG1772
3	EPA-7471A	07/18/14	07/22/14 10:11	MEV	CETAC1	1.008	BXG1667

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Reported: 08/11/2014 15:54
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: BXG2252						
Aldrin	BXG2252-BLK1	ND	mg/kg	0.00050	0.000026	
alpha-BHC	BXG2252-BLK1	ND	mg/kg	0.00050	0.00014	
beta-BHC	BXG2252-BLK1	ND	mg/kg	0.00050	0.00038	
delta-BHC	BXG2252-BLK1	ND	mg/kg	0.00050	0.000076	
gamma-BHC (Lindane)	BXG2252-BLK1	ND	mg/kg	0.00050	0.00025	
Chlordane (Technical)	BXG2252-BLK1	ND	mg/kg	0.050	0.015	
4,4'-DDD	BXG2252-BLK1	ND	mg/kg	0.00050	0.000063	
4,4'-DDE	BXG2252-BLK1	ND	mg/kg	0.00050	0.000045	
4,4'-DDT	BXG2252-BLK1	ND	mg/kg	0.00050	0.000031	
Dieldrin	BXG2252-BLK1	ND	mg/kg	0.00050	0.000032	
Endosulfan I	BXG2252-BLK1	ND	mg/kg	0.00050	0.000086	
Endosulfan II	BXG2252-BLK1	ND	mg/kg	0.00050	0.000066	
Endosulfan sulfate	BXG2252-BLK1	ND	mg/kg	0.00050	0.00013	
Endrin	BXG2252-BLK1	ND	mg/kg	0.00050	0.000035	
Endrin aldehyde	BXG2252-BLK1	ND	mg/kg	0.00050	0.000061	
Heptachlor	BXG2252-BLK1	ND	mg/kg	0.00050	0.00026	
Heptachlor epoxide	BXG2252-BLK1	ND	mg/kg	0.00050	0.00015	
Methoxychlor	BXG2252-BLK1	ND	mg/kg	0.00050	0.00013	
Toxaphene	BXG2252-BLK1	ND	mg/kg	0.050	0.0074	
PCB-1016	BXG2252-BLK1	ND	mg/kg	0.010	0.0027	
PCB-1221	BXG2252-BLK1	ND	mg/kg	0.010	0.0038	
PCB-1232	BXG2252-BLK1	ND	mg/kg	0.010	0.0024	
PCB-1242	BXG2252-BLK1	ND	mg/kg	0.010	0.0040	
PCB-1248	BXG2252-BLK1	ND	mg/kg	0.010	0.0026	
PCB-1254	BXG2252-BLK1	ND	mg/kg	0.010	0.0032	
PCB-1260	BXG2252-BLK1	ND	mg/kg	0.010	0.0016	
Total PCB's (Summation)	BXG2252-BLK1	ND	mg/kg	0.010	0.0050	
TCMX (Surrogate)	**BXG2252-BLK1**	**89.5**	%	**20 - 140 (LCL - UCL)**		
Decachlorobiphenyl (Surrogate)	**BXG2252-BLK1**	**87.2**	%	**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: BXG2252										
Aldrin	BXG2252-BS1	LCS	0.0046432	0.0050676	mg/kg	91.6		70 - 130		
gamma-BHC (Lindane)	BXG2252-BS1	LCS	0.0046486	0.0050676	mg/kg	91.7		60 - 140		
4,4'-DDT	BXG2252-BS1	LCS	0.0043814	0.0050676	mg/kg	86.5		60 - 140		
Dieldrin	BXG2252-BS1	LCS	0.0050331	0.0050676	mg/kg	99.3		70 - 130		
Endrin	BXG2252-BS1	LCS	0.0058990	0.0050676	mg/kg	116		60 - 140		
Heptachlor	BXG2252-BS1	LCS	0.0043486	0.0050676	mg/kg	85.8		40 - 140		
TCMX (Surrogate)	BXG2252-BS1	LCS	0.0088574	0.010135	mg/kg	87.4		20 - 140		
Decachlorobiphenyl (Surrogate)	BXG2252-BS1	LCS	0.022044	0.025338	mg/kg	87.0		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: BXG2252	Used client sample: N										
Aldrin	MS	1411671-07	ND	0.0045960	0.0050336	mg/kg		91.3		30 - 140	
	MSD	1411671-07	ND	0.0046875	0.0050847	mg/kg	2.0	92.2	30	30 - 140	
gamma-BHC (Lindane)	MS	1411671-07	ND	0.0048366	0.0050336	mg/kg		96.1		30 - 140	
	MSD	1411671-07	ND	0.0048268	0.0050847	mg/kg	0.2	94.9	30	30 - 140	
4,4'-DDT	MS	1411671-07	ND	0.0041711	0.0050336	mg/kg		82.9		30 - 140	
	MSD	1411671-07	ND	0.0044258	0.0050847	mg/kg	5.9	87.0	30	30 - 140	
Dieldrin	MS	1411671-07	ND	0.0047292	0.0050336	mg/kg		94.0		40 - 140	
	MSD	1411671-07	ND	0.0047359	0.0050847	mg/kg	0.1	93.1	30	40 - 140	
Endrin	MS	1411671-07	ND	0.0054493	0.0050336	mg/kg		108		30 - 150	
	MSD	1411671-07	ND	0.0054061	0.0050847	mg/kg	0.8	106	30	30 - 150	
Heptachlor	MS	1411671-07	ND	0.0044201	0.0050336	mg/kg		87.8		70 - 130	
	MSD	1411671-07	ND	0.0043949	0.0050847	mg/kg	0.6	86.4	30	70 - 130	
TCMX (Surrogate)	MS	1411671-07	ND	0.0088101	0.010067	mg/kg		87.5		20 - 140	
	MSD	1411671-07	ND	0.0090786	0.010169	mg/kg	3.0	89.3		20 - 140	
Decachlorobiphenyl (Surrogate)	MS	1411671-07	ND	0.021977	0.025168	mg/kg		87.3		20 - 140	
	MSD	1411671-07	ND	0.021977	0.025424	mg/kg	0.0	86.4		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: BXG1155						
Benzene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0013	
Bromodichloromethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.00084	
Bromoform	BXG1155-BLK1	ND	mg/kg	0.0050	0.0015	
Bromomethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0016	
Carbon tetrachloride	BXG1155-BLK1	ND	mg/kg	0.0050	0.0011	
Chlorobenzene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0013	
Chloroethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0014	
Chloroform	BXG1155-BLK1	ND	mg/kg	0.0050	0.00063	
Chloromethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0014	
Dibromochloromethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.00099	
1,2-Dichlorobenzene	BXG1155-BLK1	ND	mg/kg	0.0050	0.00081	
1,3-Dichlorobenzene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0014	
1,4-Dichlorobenzene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0015	
1,1-Dichloroethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloroethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.00085	
1,1-Dichloroethene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0012	
trans-1,2-Dichloroethene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloropropane	BXG1155-BLK1	ND	mg/kg	0.0050	0.00081	
cis-1,3-Dichloropropene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0011	
trans-1,3-Dichloropropene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0012	
Ethylbenzene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0015	
Methylene chloride	BXG1155-BLK1	ND	mg/kg	0.010	0.0024	
Methyl t-butyl ether	BXG1155-BLK1	ND	mg/kg	0.0050	0.00050	
1,1,2,2-Tetrachloroethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0011	
Tetrachloroethene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0013	
Toluene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0012	
1,1,1-Trichloroethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloroethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.00077	
Trichloroethene	BXG1155-BLK1	ND	mg/kg	0.0050	0.0011	
Trichlorofluoromethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloro-1,2,2-trifluoroethane	BXG1155-BLK1	ND	mg/kg	0.0050	0.0013	
Vinyl chloride	BXG1155-BLK1	ND	mg/kg	0.0050	0.0016	
Total Xylenes	BXG1155-BLK1	ND	mg/kg	0.010	0.0034	
Acrolein	BXG1155-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: BXG1155						
Acrylonitrile	BXG1155-BLK1	ND	mg/kg	0.020	0.0047	
1,2-Dichloroethane-d4 (Surrogate)	**BXG1155-BLK1**	**100**	%	**70 - 121 (LCL - UCL)**		
Toluene-d8 (Surrogate)	**BXG1155-BLK1**	**102**	%	**81 - 117 (LCL - UCL)**		
4-Bromofluorobenzene (Surrogate)	**BXG1155-BLK1**	**93.1**	%	**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: BXG1155										
Benzene	BXG1155-BS1	LCS	0.12659	0.12500	mg/kg	101		70 - 130		
Bromodichloromethane	BXG1155-BS1	LCS	0.12826	0.12500	mg/kg	103		70 - 130		
Chlorobenzene	BXG1155-BS1	LCS	0.13545	0.12500	mg/kg	108		70 - 130		
Chloroethane	BXG1155-BS1	LCS	0.11124	0.12500	mg/kg	89.0		70 - 130		
1,4-Dichlorobenzene	BXG1155-BS1	LCS	0.14037	0.12500	mg/kg	112		70 - 130		
1,1-Dichloroethane	BXG1155-BS1	LCS	0.12465	0.12500	mg/kg	99.7		70 - 130		
1,1-Dichloroethene	BXG1155-BS1	LCS	0.12944	0.12500	mg/kg	104		70 - 130		
Toluene	BXG1155-BS1	LCS	0.13633	0.12500	mg/kg	109		70 - 130		
Trichloroethene	BXG1155-BS1	LCS	0.13397	0.12500	mg/kg	107		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	BXG1155-BS1	LCS	0.046260	0.050000	mg/kg	92.5		70 - 121		
Toluene-d8 (Surrogate)	BXG1155-BS1	LCS	0.051770	0.050000	mg/kg	104		81 - 117		
4-Bromofluorobenzene (Surrogate)	BXG1155-BS1	LCS	0.047540	0.050000	mg/kg	95.1		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: BXG1155	Used client sample: N										
Benzene	MS	1411671-69	ND	0.12615	0.12500	mg/kg		101		70 - 130	
	MSD	1411671-69	ND	0.12583	0.12500	mg/kg	0.3	101	20	70 - 130	
Bromodichloromethane	MS	1411671-69	ND	0.12680	0.12500	mg/kg		101		70 - 130	
	MSD	1411671-69	ND	0.12588	0.12500	mg/kg	0.7	101	20	70 - 130	
Chlorobenzene	MS	1411671-69	ND	0.12490	0.12500	mg/kg		99.9		70 - 130	
	MSD	1411671-69	ND	0.13038	0.12500	mg/kg	4.3	104	20	70 - 130	
Chloroethane	MS	1411671-69	ND	0.11835	0.12500	mg/kg		94.7		70 - 130	
	MSD	1411671-69	ND	0.10686	0.12500	mg/kg	10.2	85.5	20	70 - 130	
1,4-Dichlorobenzene	MS	1411671-69	ND	0.13149	0.12500	mg/kg		105		70 - 130	
	MSD	1411671-69	ND	0.13361	0.12500	mg/kg	1.6	107	20	70 - 130	
1,1-Dichloroethane	MS	1411671-69	ND	0.12297	0.12500	mg/kg		98.4		70 - 130	
	MSD	1411671-69	ND	0.11845	0.12500	mg/kg	3.7	94.8	20	70 - 130	
1,1-Dichloroethene	MS	1411671-69	ND	0.12374	0.12500	mg/kg		99.0		70 - 130	
	MSD	1411671-69	ND	0.12215	0.12500	mg/kg	1.3	97.7	20	70 - 130	
Toluene	MS	1411671-69	ND	0.12918	0.12500	mg/kg		103		70 - 130	
	MSD	1411671-69	ND	0.12949	0.12500	mg/kg	0.2	104	20	70 - 130	
Trichloroethene	MS	1411671-69	ND	0.13474	0.12500	mg/kg		108		70 - 130	
	MSD	1411671-69	ND	0.13160	0.12500	mg/kg	2.4	105	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	1411671-69	ND	0.050100	0.050000	mg/kg		100		70 - 121	
	MSD	1411671-69	ND	0.049380	0.050000	mg/kg	1.4	98.8		70 - 121	
Toluene-d8 (Surrogate)	MS	1411671-69	ND	0.050280	0.050000	mg/kg		101		81 - 117	
	MSD	1411671-69	ND	0.050600	0.050000	mg/kg	0.6	101		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	1411671-69	ND	0.050010	0.050000	mg/kg		100		74 - 121	
	MSD	1411671-69	ND	0.048680	0.050000	mg/kg	2.7	97.4		74 - 121	

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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: BXG2138						
Acenaphthene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
Acenaphthylene	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Aldrin	BXG2138-BLK1	ND	mg/kg	0.10	0.024	
Aniline	BXG2138-BLK1	ND	mg/kg	0.20	0.053	
Anthracene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
Benzidine	BXG2138-BLK1	ND	mg/kg	3.0	0.22	
Benzo[a]anthracene	BXG2138-BLK1	ND	mg/kg	0.10	0.012	
Benzo[b]fluoranthene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
Benzo[k]fluoranthene	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Benzo[a]pyrene	BXG2138-BLK1	ND	mg/kg	0.10	0.015	
Benzo[g,h,i]perylene	BXG2138-BLK1	ND	mg/kg	0.10	0.056	
Benzoic acid	BXG2138-BLK1	ND	mg/kg	0.50	0.067	
Benzyl alcohol	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
Benzyl butyl phthalate	BXG2138-BLK1	ND	mg/kg	0.10	0.021	
alpha-BHC	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
beta-BHC	BXG2138-BLK1	ND	mg/kg	0.10	0.021	
delta-BHC	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
gamma-BHC (Lindane)	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
bis(2-Chloroethoxy)methane	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
bis(2-Chloroethyl) ether	BXG2138-BLK1	ND	mg/kg	0.10	0.016	
bis(2-Chloroisopropyl)ether	BXG2138-BLK1	ND	mg/kg	0.10	0.021	
bis(2-Ethylhexyl)phthalate	BXG2138-BLK1	ND	mg/kg	0.20	0.043	
4-Bromophenyl phenyl ether	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
4-Chloroaniline	BXG2138-BLK1	ND	mg/kg	0.10	0.027	
2-Chloronaphthalene	BXG2138-BLK1	ND	mg/kg	0.10	0.020	
4-Chlorophenyl phenyl ether	BXG2138-BLK1	ND	mg/kg	0.10	0.015	
Chrysene	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
4,4'-DDD	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
4,4'-DDE	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
4,4'-DDT	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Dibenzo[a,h]anthracene	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Dibenzofuran	BXG2138-BLK1	ND	mg/kg	0.10	0.020	
1,2-Dichlorobenzene	BXG2138-BLK1	ND	mg/kg	0.10	0.020	
1,3-Dichlorobenzene	BXG2138-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: BXG2138						
1,4-Dichlorobenzene	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
3,3-Dichlorobenzidine	BXG2138-BLK1	ND	mg/kg	0.20	0.0067	
Dieldrin	BXG2138-BLK1	ND	mg/kg	0.10	0.031	
Diethyl phthalate	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Dimethyl phthalate	BXG2138-BLK1	ND	mg/kg	0.10	0.020	
Di-n-butyl phthalate	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
2,4-Dinitrotoluene	BXG2138-BLK1	ND	mg/kg	0.10	0.022	
2,6-Dinitrotoluene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
Di-n-octyl phthalate	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
1,2-Diphenylhydrazine	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Endosulfan I	BXG2138-BLK1	ND	mg/kg	0.20	0.020	
Endosulfan II	BXG2138-BLK1	ND	mg/kg	0.20	0.021	
Endosulfan sulfate	BXG2138-BLK1	ND	mg/kg	0.10	0.021	
Endrin	BXG2138-BLK1	ND	mg/kg	0.20	0.025	
Endrin aldehyde	BXG2138-BLK1	ND	mg/kg	0.50	0.022	
Fluoranthene	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
Fluorene	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Heptachlor	BXG2138-BLK1	ND	mg/kg	0.10	0.021	
Heptachlor epoxide	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
Hexachlorobenzene	BXG2138-BLK1	ND	mg/kg	0.10	0.016	
Hexachlorobutadiene	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
Hexachlorocyclopentadiene	BXG2138-BLK1	ND	mg/kg	0.10	0.019	
Hexachloroethane	BXG2138-BLK1	ND	mg/kg	0.10	0.020	
Indeno[1,2,3-cd]pyrene	BXG2138-BLK1	ND	mg/kg	0.10	0.072	
Isophorone	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
2-Methylnaphthalene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
Naphthalene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
2-Naphthylamine	BXG2138-BLK1	ND	mg/kg	3.0	0.16	
2-Nitroaniline	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
3-Nitroaniline	BXG2138-BLK1	ND	mg/kg	0.20	0.015	
4-Nitroaniline	BXG2138-BLK1	ND	mg/kg	0.20	0.025	
Nitrobenzene	BXG2138-BLK1	ND	mg/kg	0.10	0.015	
N-Nitrosodimethylamine	BXG2138-BLK1	ND	mg/kg	0.10	0.037	
N-Nitrosodi-N-propylamine	BXG2138-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: BXG2138						
N-Nitrosodiphenylamine	BXG2138-BLK1	ND	mg/kg	0.10	0.021	
Phenanthrene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
Pyrene	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
1,2,4-Trichlorobenzene	BXG2138-BLK1	ND	mg/kg	0.10	0.018	
4-Chloro-3-methylphenol	BXG2138-BLK1	ND	mg/kg	0.20	0.022	
2-Chlorophenol	BXG2138-BLK1	ND	mg/kg	0.10	0.016	
2,4-Dichlorophenol	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
2,4-Dimethylphenol	BXG2138-BLK1	ND	mg/kg	0.10	0.035	
4,6-Dinitro-2-methylphenol	BXG2138-BLK1	ND	mg/kg	0.50	0.012	
2,4-Dinitrophenol	BXG2138-BLK1	ND	mg/kg	0.50	0.0077	
2-Methylphenol	BXG2138-BLK1	ND	mg/kg	0.10	0.017	
3- & 4-Methylphenol	BXG2138-BLK1	ND	mg/kg	0.20	0.033	
2-Nitrophenol	BXG2138-BLK1	ND	mg/kg	0.10	0.016	
4-Nitrophenol	BXG2138-BLK1	ND	mg/kg	0.20	0.018	
Pentachlorophenol	BXG2138-BLK1	ND	mg/kg	0.20	0.013	
Phenol	BXG2138-BLK1	ND	mg/kg	0.10	0.016	
2,4,5-Trichlorophenol	BXG2138-BLK1	ND	mg/kg	0.20	0.018	
2,4,6-Trichlorophenol	BXG2138-BLK1	ND	mg/kg	0.20	0.017	
2-Fluorophenol (Surrogate)	**BXG2138-BLK1**	**60.2**	%	**28 - 144 (LCL - UCL)**		
Phenol-d5 (Surrogate)	**BXG2138-BLK1**	**62.1**	%	**36 - 136 (LCL - UCL)**		
Nitrobenzene-d5 (Surrogate)	**BXG2138-BLK1**	**65.4**	%	**31 - 135 (LCL - UCL)**		
2-Fluorobiphenyl (Surrogate)	**BXG2138-BLK1**	**76.8**	%	**20 - 140 (LCL - UCL)**		
2,4,6-Tribromophenol (Surrogate)	**BXG2138-BLK1**	**65.7**	%	**20 - 150 (LCL - UCL)**		
p-Terphenyl-d14 (Surrogate)	**BXG2138-BLK1**	**60.4**	%	**30 - 150 (LCL - UCL)**		

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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 - 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: BXG2138										
Acenaphthene	BXG2138-BS1	LCS	1.5194	1.6611	mg/kg	91.5		50 - 140		
1,4-Dichlorobenzene	BXG2138-BS1	LCS	1.5026	1.6611	mg/kg	90.5		40 - 140		
2,4-Dinitrotoluene	BXG2138-BS1	LCS	1.7671	1.6611	mg/kg	106		40 - 140		
Hexachlorobenzene	BXG2138-BS1	LCS	0.82628	1.6611	mg/kg	49.7		46 - 140		
Hexachlorobutadiene	BXG2138-BS1	LCS	1.4200	1.6611	mg/kg	85.5		40 - 120		
Hexachloroethane	BXG2138-BS1	LCS	1.5932	1.6611	mg/kg	95.9		40 - 120		
Nitrobenzene	BXG2138-BS1	LCS	1.4323	1.6611	mg/kg	86.2		40 - 130		
N-Nitrosodi-N-propylamine	BXG2138-BS1	LCS	1.4168	1.6611	mg/kg	85.3		40 - 120		
Pyrene	BXG2138-BS1	LCS	1.1615	1.6611	mg/kg	69.9		40 - 150		
1,2,4-Trichlorobenzene	BXG2138-BS1	LCS	1.4932	1.6611	mg/kg	89.9		40 - 140		
4-Chloro-3-methylphenol	BXG2138-BS1	LCS	1.7094	1.6611	mg/kg	103		40 - 130		
2-Chlorophenol	BXG2138-BS1	LCS	1.3237	1.6611	mg/kg	79.7		40 - 130		
2-Methylphenol	BXG2138-BS1	LCS	1.4667	1.6611	mg/kg	88.3		40 - 140		
3- & 4-Methylphenol	BXG2138-BS1	LCS	2.8904	3.3223	mg/kg	87.0		40 - 120		
4-Nitrophenol	BXG2138-BS1	LCS	1.0046	1.6611	mg/kg	60.5		20 - 120		
Pentachlorophenol	BXG2138-BS1	LCS	1.0264	1.6611	mg/kg	61.8		20 - 130		
Phenol	BXG2138-BS1	LCS	1.3597	1.6611	mg/kg	81.9		40 - 120		
2,4,6-Trichlorophenol	BXG2138-BS1	LCS	1.4247	1.6611	mg/kg	85.8		44 - 130		
2-Fluorophenol (Surrogate)	BXG2138-BS1	LCS	2.0755	2.6578	mg/kg	78.1		28 - 144		
Phenol-d5 (Surrogate)	BXG2138-BS1	LCS	2.0824	2.6578	mg/kg	78.4		36 - 136		
Nitrobenzene-d5 (Surrogate)	BXG2138-BS1	LCS	2.2759	2.6578	mg/kg	85.6		31 - 135		
2-Fluorobiphenyl (Surrogate)	BXG2138-BS1	LCS	2.2705	2.6578	mg/kg	85.4		20 - 140		
2,4,6-Tribromophenol (Surrogate)	BXG2138-BS1	LCS	2.1414	2.6578	mg/kg	80.6		20 - 150		
p-Terphenyl-d14 (Surrogate)	BXG2138-BS1	LCS	0.77610	1.3289	mg/kg	58.4		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: BXG2138	Used client sample: N										
Acenaphthene	MS	1408395-63	ND	1.4431	1.6393	mg/kg		88.0		40 - 140	
	MSD	1408395-63	ND	1.3870	1.6892	mg/kg	4.0	82.1	30	40 - 140	
1,4-Dichlorobenzene	MS	1408395-63	ND	1.4579	1.6393	mg/kg		88.9		30 - 150	
	MSD	1408395-63	ND	1.3803	1.6892	mg/kg	5.5	81.7	30	30 - 150	
2,4-Dinitrotoluene	MS	1408395-63	ND	1.7972	1.6393	mg/kg		110		30 - 140	
	MSD	1408395-63	ND	1.5572	1.6892	mg/kg	14.3	92.2	30	30 - 140	
Hexachlorobenzene	MS	1408395-63	ND	0.82119	1.6393	mg/kg		50.1		30 - 150	
	MSD	1408395-63	ND	0.74551	1.6892	mg/kg	9.7	44.1	30	30 - 150	
Hexachlorobutadiene	MS	1408395-63	ND	1.2952	1.6393	mg/kg		79.0		20 - 140	
	MSD	1408395-63	ND	1.3174	1.6892	mg/kg	1.7	78.0	30	20 - 140	
Hexachloroethane	MS	1408395-63	ND	1.5624	1.6393	mg/kg		95.3		30 - 140	
	MSD	1408395-63	ND	1.4863	1.6892	mg/kg	5.0	88.0	30	30 - 140	
Nitrobenzene	MS	1408395-63	ND	1.3808	1.6393	mg/kg		84.2		30 - 140	
	MSD	1408395-63	ND	1.3439	1.6892	mg/kg	2.7	79.6	30	30 - 140	
N-Nitrosodi-N-propylamine	MS	1408395-63	ND	1.5199	1.6393	mg/kg		92.7		30 - 120	
	MSD	1408395-63	ND	1.3184	1.6892	mg/kg	14.2	78.1	30	30 - 120	
Pyrene	MS	1408395-63	ND	1.1709	1.6393	mg/kg		71.4		40 - 150	
	MSD	1408395-63	ND	1.1803	1.6892	mg/kg	0.8	69.9	30	40 - 150	
1,2,4-Trichlorobenzene	MS	1408395-63	ND	1.4003	1.6393	mg/kg		85.4		30 - 150	
	MSD	1408395-63	ND	1.3900	1.6892	mg/kg	0.7	82.3	30	30 - 150	
4-Chloro-3-methylphenol	MS	1408395-63	ND	1.7522	1.6393	mg/kg		107		40 - 130	
	MSD	1408395-63	ND	1.4683	1.6892	mg/kg	17.6	86.9	30	40 - 130	
2-Chlorophenol	MS	1408395-63	ND	1.3566	1.6393	mg/kg		82.8		40 - 130	
	MSD	1408395-63	ND	1.1780	1.6892	mg/kg	14.1	69.7	30	40 - 130	
2-Methylphenol	MS	1408395-63	ND	1.5653	1.6393	mg/kg		95.5		30 - 140	
	MSD	1408395-63	ND	1.3118	1.6892	mg/kg	17.6	77.7	30	30 - 140	
3- & 4-Methylphenol	MS	1408395-63	ND	3.1985	3.2787	mg/kg		97.6		40 - 130	
	MSD	1408395-63	ND	2.5927	3.3784	mg/kg	20.9	76.7	30	40 - 130	
4-Nitrophenol	MS	1408395-63	ND	0.98235	1.6393	mg/kg		59.9		20 - 140	
	MSD	1408395-63	ND	0.80538	1.6892	mg/kg	19.8	47.7	30	20 - 140	
Pentachlorophenol	MS	1408395-63	ND	0.98298	1.6393	mg/kg		60.0		20 - 130	
	MSD	1408395-63	ND	0.82912	1.6892	mg/kg	17.0	49.1	30	20 - 130	
Phenol	MS	1408395-63	ND	1.4620	1.6393	mg/kg		89.2		30 - 130	
	MSD	1408395-63	ND	1.2536	1.6892	mg/kg	15.4	74.2	30	30 - 130	
2,4,6-Trichlorophenol	MS	1408395-63	ND	1.3689	1.6393	mg/kg		83.5		40 - 140	
	MSD	1408395-63	ND	1.3228	1.6892	mg/kg	3.4	78.3	30	40 - 140	

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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: BXG2138	Used client sample: N										
2-Fluorophenol (Surrogate)	MS	1408395-63	ND	2.1051	2.6230	mg/kg		80.3		28 - 144	
	MSD	1408395-63	ND	1.8740	2.7027	mg/kg	11.6	69.3		28 - 144	
Phenol-d5 (Surrogate)	MS	1408395-63	ND	2.2618	2.6230	mg/kg		86.2		36 - 136	
	MSD	1408395-63	ND	1.8984	2.7027	mg/kg	17.5	70.2		36 - 136	
Nitrobenzene-d5 (Surrogate)	MS	1408395-63	ND	2.4268	2.6230	mg/kg		92.5		31 - 135	
	MSD	1408395-63	ND	2.0803	2.7027	mg/kg	15.4	77.0		31 - 135	
2-Fluorobiphenyl (Surrogate)	MS	1408395-63	ND	2.1948	2.6230	mg/kg		83.7		20 - 140	
	MSD	1408395-63	ND	2.2486	2.7027	mg/kg	2.4	83.2		20 - 140	
2,4,6-Tribromophenol (Surrogate)	MS	1408395-63	ND	2.0947	2.6230	mg/kg		79.9		20 - 150	
	MSD	1408395-63	ND	1.9185	2.7027	mg/kg	8.8	71.0		20 - 150	
p-Terphenyl-d14 (Surrogate)	MS	1408395-63	ND	0.79066	1.3115	mg/kg		60.3		30 - 150	
	MSD	1408395-63	ND	0.75086	1.3514	mg/kg	5.2	55.6		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: BXG1769						
Oil and Grease	BXG1769-BLK1	ND	mg/kg	50	20	

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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: BXG1769										
Oil and Grease	BXG1769-BS1	LCS	639.00	768.00	mg/kg	83.2		59 - 117		

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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: BXG1769	Used client sample: N										
Oil and Grease	DUP	1411671-69	ND	ND		mg/kg			30		
	MS	1411671-69	ND	634.00	768.00	mg/kg		82.6		56 - 111	
	MSD	1411671-69	ND	636.00	768.00	mg/kg	0.3	82.8	30	56 - 111	

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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: BXG1620						
Moisture	BXG1620-BLK1	ND	%	0.05	0.05	
QC Batch ID: BXG2204						
Total Cyanide	BXG2204-BLK1	ND	mg/kg	0.50	0.37	
QC Batch ID: BXG2206						
Ammonia as N	BXG2206-BLK1	ND	mg/kg	10	5.0	
QC Batch ID: BXG2400						
Total Kjeldahl Nitrogen	BXG2400-BLK1	ND	mg/kg	40	16	
QC Batch ID: BXG2401						
Total Phosphate	BXG2401-BLK1	ND	mg/kg	30	13	
QC Batch ID: BXG2540						
Nitrate as NO3	BXG2540-BLK1	ND	mg/kg	4.4	1.2	

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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: BXG1727										
pH	BXG1727-BS1	LCS	3.9180	4.0000	pH Units	98.0		95 - 105		
QC Batch ID: BXG2204										
Total Cyanide	BXG2204-BS1	LCS	16.150	15.000	mg/kg	108		80 - 120		
QC Batch ID: BXG2206										
Ammonia as N	BXG2206-BS1	LCS	99.340	100.00	mg/kg	99.3		80 - 120		
QC Batch ID: BXG2400										
Total Kjeldahl Nitrogen	BXG2400-BS1	LCS	380.66	400.00	mg/kg	95.2		90 - 110		
QC Batch ID: BXG2401										
Total Phosphate	BXG2401-BS1	LCS	606.00	613.20	mg/kg	98.8		85 - 115		
QC Batch ID: BXG2540										
Nitrate as NO3	BXG2540-BS1	LCS	22.665	22.134	mg/kg	102		90 - 110		

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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: BXG1727	Used client sample: N										
pH	DUP	1415989-01	10.293	10.298		pH Units	0.0		20		
QC Batch ID: BXG1906	Used client sample: Y - Description: Composite Biosolids, 07/16/2014 09:00										
Solids	DUP	1416060-01	71.230	71.140		%	0.1		20		
QC Batch ID: BXG2204	Used client sample: Y - Description: Composite Biosolids, 07/16/2014 09:00										
Total Cyanide	DUP	**1416060-01**	**4.1117**	**4.0017**		**mg/kg**	**2.7**		**20**		
	MS	**1416060-01**	**4.1117**	**11.602**	**10.000**	**mg/kg**		**74.9**		**80 - 120**	**Q03**
	MSD	**1416060-01**	**4.1117**	**11.413**	**10.000**	**mg/kg**	**1.6**	**73.0**	**20**	**80 - 120**	**Q03**
QC Batch ID: BXG2206	Used client sample: Y - Description: Composite Biosolids, 07/16/2014 09:00										
Ammonia as N	DUP	**1416060-01**	**5285.0**	**4577.5**		**mg/kg**	**14.3**		**20**		
	MS	**1416060-01**	**5285.0**	**4343.0**	**100.00**	**mg/kg**		**-942**		**80 - 120**	**A03**
	MSD	**1416060-01**	**5285.0**	**4679.5**	**100.00**	**mg/kg**	**7.5**	**-606**	**20**	**80 - 120**	**A03**
QC Batch ID: BXG2400	Used client sample: Y - Description: Composite Biosolids, 07/16/2014 09:00										
Total Kjeldahl Nitrogen	DUP	**1416060-01**	**19710**	**16541**		**mg/kg**	**17.5**		**20**		
	MS	**1416060-01**	**19710**	**20778**	**400.00**	**mg/kg**		**267**		**90 - 110**	**A03**
	MSD	**1416060-01**	**19710**	**21454**	**400.00**	**mg/kg**	**3.2**	**436**	**20**	**90 - 110**	**A03**
QC Batch ID: BXG2401	Used client sample: Y - Description: Composite Biosolids, 07/16/2014 09:00										
Total Phosphate	DUP	**1416060-01**	**54100**	**50531**		**mg/kg**	**6.8**		**20**		
	MS	**1416060-01**	**54100**	**58659**	**613.20**	**mg/kg**		**744**		**80 - 120**	**A03**
	MSD	**1416060-01**	**54100**	**59264**	**613.20**	**mg/kg**	**1.0**	**842**	**20**	**80 - 120**	**A03**
QC Batch ID: BXG2540	Used client sample: N										
Nitrate as NO3	DUP	1416340-09	63.436	64.277		mg/kg	1.3		20		
	MS	1416340-09	63.436	289.98	223.58	mg/kg		101		80 - 120	
	MSD	1416340-09	63.436	287.29	223.58	mg/kg	0.9	100	20	80 - 120	

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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: BXG1775						
Hexavalent Chromium	BXG1775-BLK1	ND	mg/L	0.20	0.070	
QC Batch ID: BXG1838						
Total Dissolved Solids @ 180 C	BXG1838-BLK1	ND	mg/L	6.7	6.7	

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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: BXG1775										
Hexavalent Chromium	BXG1775-BS1	LCS	4.9429	5.0000	mg/L	98.9		85 - 115		
QC Batch ID: BXG1838										
Total Dissolved Solids @ 180 C	BXG1838-BS1	LCS	555.00	586.00	mg/L	94.7		90 - 110		

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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: BXG1775	Used client sample: Y - Description: Composite Biosolids, 07/16/2014 09:00										
Hexavalent Chromium	DUP	1416060-01	ND	ND		mg/L			20		
	MS	1416060-01	ND	5.0357	5.2632	mg/L		95.7		85 - 115	
	MSD	1416060-01	ND	5.0117	5.2632	mg/L	0.5	95.2	20	85 - 115	
QC Batch ID: BXG1838	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1416054-01	1740.0	1660.0		mg/L	4.7		20		

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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: BXG1820						
Copper	BXG1820-BLK1	0.023480	mg/L	0.10	0.012	J

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Project Number: [none]
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: BXG1820										
Copper	BXG1820-BS1	LCS	19.897	20.000	mg/L	99.5		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: BXG1820	Used client sample: N										
Copper	DUP	1415433-01	0.26872	0.24864		mg/L	7.8		20		
	MS	1415433-01	0.26872	20.242	20.408	mg/L		97.9		75 - 125	
	MSD	1415433-01	0.26872	20.812	20.408	mg/L	2.8	101	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: BXG1659						
Antimony	BXG1659-BLK1	ND	mg/kg	5.0	0.33	
Arsenic	**BXG1659-BLK1**	**0.79670**	**mg/kg**	**1.0**	**0.40**	**J**
Barium	BXG1659-BLK1	ND	mg/kg	0.50	0.18	
Beryllium	BXG1659-BLK1	ND	mg/kg	0.50	0.047	
Cadmium	BXG1659-BLK1	ND	mg/kg	0.50	0.052	
Chromium	BXG1659-BLK1	ND	mg/kg	0.50	0.050	
Cobalt	BXG1659-BLK1	ND	mg/kg	2.5	0.098	
Copper	BXG1659-BLK1	ND	mg/kg	1.0	0.050	
Lead	BXG1659-BLK1	ND	mg/kg	2.5	0.28	
Molybdenum	BXG1659-BLK1	ND	mg/kg	2.5	0.050	
Nickel	BXG1659-BLK1	ND	mg/kg	0.50	0.15	
Selenium	BXG1659-BLK1	ND	mg/kg	1.0	0.98	
Silver	BXG1659-BLK1	ND	mg/kg	0.50	0.067	
Thallium	BXG1659-BLK1	ND	mg/kg	5.0	0.64	
Vanadium	**BXG1659-BLK1**	**0.25049**	**mg/kg**	**0.50**	**0.11**	**J**
Zinc	**BXG1659-BLK1**	**0.28760**	**mg/kg**	**2.5**	**0.087**	**J**
Boron	BXG1659-BLK1	ND	mg/kg	5.0	0.50	
QC Batch ID: BXG1667						
Mercury	BXG1667-BLK1	ND	mg/kg	0.16	0.036	
QC Batch ID: BXG1772						
Total Hexavalent Chromium	**BXG1772-BLK1**	**0.15600**	**mg/kg**	**1.0**	**0.15**	**J**

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Project Manager: Doug Coats

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: BXG1659										
Antimony	BXG1659-BS1	LCS	93.663	100.00	mg/kg	93.7		75 - 125		
Arsenic	BXG1659-BS1	LCS	10.213	10.000	mg/kg	102		75 - 125		
Barium	BXG1659-BS1	LCS	104.34	100.00	mg/kg	104		75 - 125		
Beryllium	BXG1659-BS1	LCS	10.288	10.000	mg/kg	103		75 - 125		
Cadmium	BXG1659-BS1	LCS	10.027	10.000	mg/kg	100		75 - 125		
Chromium	BXG1659-BS1	LCS	101.83	100.00	mg/kg	102		75 - 125		
Cobalt	BXG1659-BS1	LCS	106.05	100.00	mg/kg	106		75 - 125		
Copper	BXG1659-BS1	LCS	100.42	100.00	mg/kg	100		75 - 125		
Lead	BXG1659-BS1	LCS	102.38	100.00	mg/kg	102		75 - 125		
Molybdenum	BXG1659-BS1	LCS	101.56	100.00	mg/kg	102		75 - 125		
Nickel	BXG1659-BS1	LCS	105.64	100.00	mg/kg	106		75 - 125		
Selenium	BXG1659-BS1	LCS	9.3048	10.000	mg/kg	93.0		75 - 125		
Silver	BXG1659-BS1	LCS	9.9801	10.000	mg/kg	99.8		75 - 125		
Thallium	BXG1659-BS1	LCS	102.80	100.00	mg/kg	103		75 - 125		
Vanadium	BXG1659-BS1	LCS	99.556	100.00	mg/kg	99.6		75 - 125		
Zinc	BXG1659-BS1	LCS	103.29	100.00	mg/kg	103		75 - 125		
Boron	BXG1659-BS1	LCS	97.025	100.00	mg/kg	97.0		75 - 125		
QC Batch ID: BXG1667										
Mercury	BXG1667-BS1	LCS	0.78496	0.80000	mg/kg	98.1		80 - 120		
QC Batch ID: BXG1772										
Total Hexavalent Chromium	BXG1772-BS1	LCS	41.316	40.000	mg/kg	103		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: BXG1659	Used client sample: N										
Antimony	DUP	1416054-01	4.2654	3.9537		mg/kg	7.6		20		J
	MS	1416054-01	4.2654	26.370	98.039	mg/kg		22.5		16 - 119	
	MSD	1416054-01	4.2654	26.899	98.039	mg/kg	2.0	23.1	20	16 - 119	
Arsenic	DUP	**1416054-01**	**0.94166**	**1.0673**		**mg/kg**	**12.5**		**20**		
	MS	**1416054-01**	**0.94166**	**12.788**	**9.8039**	**mg/kg**		**121**		**75 - 125**	
	MSD	**1416054-01**	**0.94166**	**13.429**	**9.8039**	**mg/kg**	**4.9**	**127**	**20**	**75 - 125**	**Q03**
Barium	DUP	**1416054-01**	**236.38**	**244.57**		**mg/kg**	**3.4**		**20**		
	MS	**1416054-01**	**236.38**	**360.24**	**98.039**	**mg/kg**		**126**		**75 - 125**	**Q03**
	MSD	**1416054-01**	**236.38**	**353.38**	**98.039**	**mg/kg**	**1.9**	**119**	**20**	**75 - 125**	
Beryllium	DUP	1416054-01	0.27465	0.27255		mg/kg	0.8		20		J
	MS	1416054-01	0.27465	9.1681	9.8039	mg/kg		90.7		75 - 125	
	MSD	1416054-01	0.27465	9.2364	9.8039	mg/kg	0.7	91.4	20	75 - 125	
Cadmium	DUP	1416054-01	0.31869	0.34339		mg/kg	7.5		20		J
	MS	1416054-01	0.31869	9.4855	9.8039	mg/kg		93.5		75 - 125	
	MSD	1416054-01	0.31869	9.4603	9.8039	mg/kg	0.3	93.2	20	75 - 125	
Chromium	DUP	1416054-01	23.370	24.132		mg/kg	3.2		20		
	MS	1416054-01	23.370	108.00	98.039	mg/kg		86.3		75 - 125	
	MSD	1416054-01	23.370	109.11	98.039	mg/kg	1.0	87.5	20	75 - 125	
Cobalt	DUP	1416054-01	6.0357	6.2464		mg/kg	3.4		20		
	MS	1416054-01	6.0357	84.037	98.039	mg/kg		79.6		75 - 125	
	MSD	1416054-01	6.0357	87.605	98.039	mg/kg	4.2	83.2	20	75 - 125	
Copper	DUP	1416054-01	19.841	20.091		mg/kg	1.3		20		
	MS	1416054-01	19.841	112.40	98.039	mg/kg		94.4		75 - 125	
	MSD	1416054-01	19.841	112.06	98.039	mg/kg	0.3	94.1	20	75 - 125	
Lead	DUP	1416054-01	9.1807	9.7222		mg/kg	5.7		20		
	MS	1416054-01	9.1807	92.929	98.039	mg/kg		85.4		75 - 125	
	MSD	1416054-01	9.1807	94.761	98.039	mg/kg	2.0	87.3	20	75 - 125	
Molybdenum	DUP	1416054-01	1.6059	1.5736		mg/kg	2.0		20		J
	MS	1416054-01	1.6059	81.806	98.039	mg/kg		81.8		75 - 125	
	MSD	1416054-01	1.6059	80.824	98.039	mg/kg	1.2	80.8	20	75 - 125	
Nickel	DUP	1416054-01	26.649	28.063		mg/kg	5.2		20		
	MS	1416054-01	26.649	105.91	98.039	mg/kg		80.8		75 - 125	
	MSD	1416054-01	26.649	109.82	98.039	mg/kg	3.6	84.8	20	75 - 125	
Selenium	DUP	1416054-01	ND	1.5549		mg/kg			20		
	MS	1416054-01	ND	10.563	9.8039	mg/kg		108		75 - 125	
	MSD	1416054-01	ND	11.424	9.8039	mg/kg	7.8	117	20	75 - 125	
Silver	DUP	**1416054-01**	**0.31417**	**0.47950**		**mg/kg**	**41.7**		**20**		**J,A02**
	MS	**1416054-01**	**0.31417**	**9.7176**	**9.8039**	**mg/kg**		**95.9**		**75 - 125**	
	MSD	**1416054-01**	**0.31417**	**9.5098**	**9.8039**	**mg/kg**	**2.2**	**93.8**	**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: BXG1659	Used client sample: N										
Thallium	DUP	**1416054-01**	**2.4308**	**1.7193**		**mg/kg**	**34.3**		**20**		**J,A02**
	MS	**1416054-01**	**2.4308**	**78.640**	**98.039**	**mg/kg**		**77.7**		**75 - 125**	
	MSD	**1416054-01**	**2.4308**	**82.661**	**98.039**	**mg/kg**	**5.0**	**81.8**	**20**	**75 - 125**	
Vanadium	DUP	1416054-01	43.188	46.152		mg/kg	6.6		20		
	MS	1416054-01	43.188	129.87	98.039	mg/kg		88.4		75 - 125	
	MSD	1416054-01	43.188	128.31	98.039	mg/kg	1.2	86.8	20	75 - 125	
Zinc	DUP	1416054-01	53.136	54.381		mg/kg	2.3		20		
	MS	1416054-01	53.136	133.78	98.039	mg/kg		82.3		75 - 125	
	MSD	1416054-01	53.136	135.21	98.039	mg/kg	1.1	83.7	20	75 - 125	
Boron	DUP	1416054-01	16.961	15.812		mg/kg	7.0		20		
	MS	1416054-01	16.961	99.972	98.039	mg/kg		84.7		75 - 125	
	MSD	1416054-01	16.961	100.71	98.039	mg/kg	0.7	85.4	20	75 - 125	
QC Batch ID: BXG1667	Used client sample: N										
Mercury	DUP	1415830-01	0.036308	ND		mg/kg			20		
	MS	1415830-01	0.036308	0.72785	0.76923	mg/kg		89.9		80 - 120	
	MSD	1415830-01	0.036308	0.75615	0.76923	mg/kg	3.8	93.6	20	80 - 120	
QC Batch ID: BXG1772	Used client sample: N										
Total Hexavalent Chromium	DUP	1416125-01	0.52600	0.51000		mg/kg	3.1		20		J
	MS	1416125-01	0.52600	35.206	40.000	mg/kg		86.7		75 - 125	
	MSD	1416125-01	0.52600	35.094	40.000	mg/kg	0.3	86.4	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.
pH1:1	pH result reported on a 1:1 dilution of sample
Q03	Matrix spike recovery(s) is(are) not within the control limits.
S09	The surrogate recovery on the sample for this compound was not within the control limits.