



Midwest Laboratories
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15 February 2019

Work Order: 1545814

KARLA ADAMI
CITY OF LARAMIE WWTP - 34024
PO BOX C
LARAMIE, WY 82073
RE: 503 Regs for Biosolids

Enclosed are the results of analyses for samples received by the laboratory on 2019-02-12 10:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Ferris", with a long, sweeping horizontal stroke extending to the right.

Robert Ferris
Project Manager
raf4@midwestlabs.com



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CITY OF LARAMIE WWTP - 34024
 PO BOX C
 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
01	1545814-01	Solid	2019-02-11 12:00	2019-02-12 10:30
02	1545814-02	Solid	2019-02-11 12:00	2019-02-12 10:30
03	1545814-03	Solid	2019-02-11 12:00	2019-02-12 10:30
04	1545814-04	Solid	2019-02-11 12:00	2019-02-12 10:30

Containers used for the following analyses:

- 1545814-01 A: EPA 9045, SM 2540 G
- 1545814-01 B: PAI-DK 01, SM 4500-NH3 C-1997
- 1545814-01 C: Total Metals per EPA 6010B, Total Metals per EPA 6020, Total Metals per EPA 7471
- 1545814-01 D: EPA 353.2
- 1545814-02 A: EPA 9045, SM 2540 G
- 1545814-02 B: PAI-DK 01, SM 4500-NH3 C-1997
- 1545814-02 C: Total Metals per EPA 6010B, Total Metals per EPA 6020, Total Metals per EPA 7471
- 1545814-02 D: EPA 353.2
- 1545814-03 A: EPA 9045, SM 2540 G
- 1545814-03 B: PAI-DK 01, SM 4500-NH3 C-1997
- 1545814-03 C: Total Metals per EPA 6010B, Total Metals per EPA 6020, Total Metals per EPA 7471
- 1545814-03 D: EPA 353.2
- 1545814-04 A: EPA 9045, SM 2540 G
- 1545814-04 B: PAI-DK 01, SM 4500-NH3 C-1997
- 1545814-04 C: Total Metals per EPA 6010B, Total Metals per EPA 6020, Total Metals per EPA 7471
- 1545814-04 D: EPA 353.2



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2019-02-15 20:18

Analysis Results Reviewed by:

Total Metals per EPA 6010B reviewed by kkh9.

Total Metals per EPA 6020 reviewed by kkh9.

Total Metals per EPA 7471 reviewed by kkh9.

EPA 353.2 reviewed by jdb5.

EPA 9045 reviewed by jdb5.

PAI-DK 01 reviewed by bjs0.

SM 2540 G reviewed by jdb5.

SM 4500-NH3 C-1997 reviewed by bjs0.



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 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Sample ID: 01
Laboratory ID: 1545814-01
Sampled Date/Time: 2019-02-11 12:00

Analyte	Dry Weight Result	Reporting Limit	Units	As Received Result	Method	Prepared	Analyzed	Analyst	(Container) / Notes
Total Metals									
Arsenic	3.4	0.002	mg/kg dry	2.9 mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)
Barium	129.9	0.05	mg/kg dry	108.7 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Cadmium	0.6	0.1	mg/kg dry	0.5 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Calcium	41340	6.0	mg/kg dry	34580 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Chromium	11.4	0.4	mg/kg dry	9.6 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Copper	96.7	0.2	mg/kg dry	80.9 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Iron	7698	1.5	mg/kg dry	6439 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Lead	12.8	0.8	mg/kg dry	10.7 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Magnesium	6441	1.4	mg/kg dry	5388 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Manganese	187.2	0.1	mg/kg dry	156.6 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Mercury	0.24	0.001	mg/kg dry	0.20 mg/kg	EPA 7471	2019-02-13	2019-02-14	pjd8	(C)
Molybdenum	1.7	0.2	mg/kg dry	1.4 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Nickel	8.3	0.2	mg/kg dry	6.9 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Phosphate (P2O5)	7301	13.6	mg/kg dry	mg/kg	Calculation	2019-02-13	2019-02-13	ery3	
Phosphorus	3188	0.8	mg/kg dry	2667 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Potash (K2O)	5973	7.1	mg/kg dry	mg/kg	Calculation	2019-02-13	2019-02-13	ery3	
Potassium	4978	2.2	mg/kg dry	4164 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Selenium	2.2	0.009	mg/kg dry	1.8 mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)
Silver	0.8	0.1	mg/kg dry	0.7 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Sodium	396.1	1.0	mg/kg dry	331.3 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Sulfur	2540	1.0	mg/kg dry	2125 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Zinc	126.0	0.6	mg/kg dry	105.4 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Environmental Chemistry									
Ammonia as N	1390	29.9	mg/kg dry	1160 mg/kg	SM 4500-NH3 C-1997	2019-02-14	2019-02-14	cjs4	(B)
Total Kjeldahl Nitrogen	10100	299	mg/kg dry	8420 mg/kg	PAI-DK 01	2019-02-15	2019-02-15	cbv7	(B)
Nitrate/Nitrite Nitrogen	46.5	1.0	mg/kg dry	38.9 mg/kg	EPA 353.2	2019-02-14	2019-02-14	jaj4	(D)
Organic Nitrogen	8680	299	mg/kg dry	mg/kg	Calculation	2019-02-15	2019-02-15	cbv7	
pH @ 18.3°C			S.U.	8.07 S.U.	EPA 9045	2019-02-14	2019-02-14	jsa6	(A)
Percent Solids		0.01	%	83.65 %	SM 2540 G	2019-02-13	2019-02-14	jsp2	(A)



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 PO BOX C
 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Sample ID: 02
Laboratory ID: 1545814-02
Sampled Date/Time: 2019-02-11 12:00

Analyte	Dry Weight Result	Reporting Limit	Units	As Received Result	Method	Prepared	Analyzed	Analyst	(Container) /
									Notes
Total Metals									
Arsenic	3.7	0.002	mg/kg dry	3.1 mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)
Barium	171.8	0.05	mg/kg dry	143.7 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Cadmium	0.6	0.1	mg/kg dry	0.5 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Calcium	33960	5.9	mg/kg dry	28400 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Chromium	13.7	0.4	mg/kg dry	11.4 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Copper	137.4	0.2	mg/kg dry	114.9 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Iron	9414	1.5	mg/kg dry	7874 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Lead	21.1	0.8	mg/kg dry	17.6 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Magnesium	8945	1.4	mg/kg dry	7482 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Manganese	234.3	0.1	mg/kg dry	196.0 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Mercury	0.15	0.001	mg/kg dry	0.12 mg/kg	EPA 7471	2019-02-13	2019-02-14	pjd8	(C)
Molybdenum	2.2	0.1	mg/kg dry	1.8 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Nickel	10.9	0.2	mg/kg dry	9.1 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Phosphate (P2O5)	10420	13.4	mg/kg dry	mg/kg	Calculation	2019-02-13	2019-02-13	ery3	
Phosphorus	4549	0.8	mg/kg dry	3805 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Potash (K2O)	9086	7.0	mg/kg dry	mg/kg	Calculation	2019-02-13	2019-02-13	ery3	
Potassium	7572	2.2	mg/kg dry	6333 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Selenium	2.8	0.009	mg/kg dry	2.3 mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)
Silver	1.1	0.1	mg/kg dry	0.9 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Sodium	503.2	1.0	mg/kg dry	420.9 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Sulfur	3364	1.0	mg/kg dry	2814 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Zinc	173.1	0.6	mg/kg dry	144.8 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Environmental Chemistry									
Ammonia as N	1220	29.9	mg/kg dry	1020 mg/kg	SM 4500-NH3 C-1997	2019-02-14	2019-02-14	cjs4	(B)
Total Kjeldahl Nitrogen	11600	299	mg/kg dry	9680 mg/kg	PAI-DK 01	2019-02-15	2019-02-15	cbv7	(B)
Nitrate/Nitrite Nitrogen	42.8	1.0	mg/kg dry	35.8 mg/kg	EPA 353.2	2019-02-14	2019-02-14	jaj4	(D)
Organic Nitrogen	10400	299	mg/kg dry	mg/kg	Calculation	2019-02-15	2019-02-15	cbv7	
pH @ 18.2°C			S.U.	8.21 S.U.	EPA 9045	2019-02-14	2019-02-14	jsa6	(A)
Percent Solids		0.01	%	83.64 %	SM 2540 G	2019-02-13	2019-02-14	jsp2	(A)



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 PO BOX C
 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Sample ID: 03
Laboratory ID: 1545814-03
Sampled Date/Time: 2019-02-11 12:00

Analyte	Dry Weight	Reporting	Units	As Received	Method	Prepared	Analyzed	Analyst	(Container) /
	Result	Limit		Result					Notes
Total Metals									
Arsenic	3.2	0.002	mg/kg dry	2.7 mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)
Barium	138.0	0.05	mg/kg dry	113.5 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Cadmium	0.5	0.1	mg/kg dry	0.4 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Calcium	39710	6.0	mg/kg dry	32660 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Chromium	11.2	0.4	mg/kg dry	9.2 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Copper	95.5	0.2	mg/kg dry	78.5 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Iron	7805	1.5	mg/kg dry	6420 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Lead	12.3	0.8	mg/kg dry	10.1 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Magnesium	6162	1.5	mg/kg dry	5068 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Manganese	190.2	0.1	mg/kg dry	156.4 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Mercury	0.16	0.001	mg/kg dry	0.13 mg/kg	EPA 7471	2019-02-13	2019-02-14	pjd8	(C)
Molybdenum	1.6	0.2	mg/kg dry	1.3 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Nickel	8.3	0.2	mg/kg dry	6.8 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Phosphate (P2O5)	7303	13.8	mg/kg dry	mg/kg	Calculation	2019-02-13	2019-02-13	ery3	
Phosphorus	3189	0.8	mg/kg dry	2623 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Potash (K2O)	5950	7.2	mg/kg dry	mg/kg	Calculation	2019-02-13	2019-02-13	ery3	
Potassium	4958	2.3	mg/kg dry	4078 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Selenium	1.9	0.009	mg/kg dry	1.6 mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)
Silver	0.8	0.1	mg/kg dry	0.6 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Sodium	385.7	1.0	mg/kg dry	317.2 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Sulfur	2491	1.0	mg/kg dry	2049 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Zinc	127.9	0.6	mg/kg dry	105.2 mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)
Environmental Chemistry									
Ammonia as N	1440	30.4	mg/kg dry	1180 mg/kg	SM 4500-NH3 C-1997	2019-02-14	2019-02-14	cjs4	(B)
Total Kjeldahl Nitrogen	10500	304	mg/kg dry	8670 mg/kg	PAI-DK 01	2019-02-15	2019-02-15	cbv7	(B)
Nitrate/Nitrite Nitrogen	45.9	1.0	mg/kg dry	37.8 mg/kg	EPA 353.2	2019-02-14	2019-02-14	jaj4	(D)
Organic Nitrogen	9100	304	mg/kg dry	mg/kg	Calculation	2019-02-15	2019-02-15	cbv7	
pH @ 18.2°C			S.U.	8.18 S.U.	EPA 9045	2019-02-14	2019-02-14	jsa6	(A)
Percent Solids		0.01	%	82.25 %	SM 2540 G	2019-02-13	2019-02-14	jsp2	(A)



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 PO BOX C
 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Sample ID: 04
Laboratory ID: 1545814-04
Sampled Date/Time: 2019-02-11 12:00

Analyte	Dry Weight		Reporting		As Received		Method	Prepared	Analyzed	Analyst	(Container) / Notes
	Result	Limit	Units	Result	Units	Result					
Total Metals											
Arsenic	3.6	0.002	mg/kg dry	3.1	mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)	
Barium	166.0	0.05	mg/kg dry	141.4	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Cadmium	0.5	0.1	mg/kg dry	0.4	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Calcium	29610	5.7	mg/kg dry	25220	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Chromium	12.3	0.3	mg/kg dry	10.4	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Copper	110.5	0.2	mg/kg dry	94.1	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Iron	8177	1.4	mg/kg dry	6965	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Lead	14.9	0.8	mg/kg dry	12.7	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Magnesium	6428	1.4	mg/kg dry	5475	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Manganese	195.2	0.1	mg/kg dry	166.3	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Mercury	0.13	0.0009	mg/kg dry	0.11	mg/kg	EPA 7471	2019-02-13	2019-02-14	pjd8	(C)	
Molybdenum	2.1	0.1	mg/kg dry	1.8	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Nickel	8.6	0.2	mg/kg dry	7.3	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Phosphate (P2O5)	8495	13.0	mg/kg dry		mg/kg	Calculation	2019-02-13	2019-02-13	ery3		
Phosphorus	3710	0.8	mg/kg dry	3160	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Potash (K2O)	6379	6.8	mg/kg dry		mg/kg	Calculation	2019-02-13	2019-02-13	ery3		
Potassium	5316	2.1	mg/kg dry	4528	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Selenium	2.7	0.009	mg/kg dry	2.3	mg/kg	EPA 6020	2019-02-13	2019-02-14	ras7	(C)	
Silver	0.9	0.1	mg/kg dry	0.7	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Sodium	408.8	1.0	mg/kg dry	348.2	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Sulfur	2782	1.0	mg/kg dry	2370	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Zinc	139.5	0.6	mg/kg dry	118.8	mg/kg	EPA 6010B	2019-02-13	2019-02-13	ery3	(C)	
Environmental Chemistry											
Ammonia as N	1170	29.3	mg/kg dry	996	mg/kg	SM 4500-NH3 C-1997	2019-02-14	2019-02-14	cjs4	(B)	
Total Kjeldahl Nitrogen	9630	293	mg/kg dry	8200	mg/kg	PAI-DK 01	2019-02-15	2019-02-15	cbv7	(B)	
Nitrate/Nitrite Nitrogen	40.0	1.0	mg/kg dry	34.0	mg/kg	EPA 353.2	2019-02-14	2019-02-14	jaj4	(D)	
Organic Nitrogen	8460	293	mg/kg dry		mg/kg	Calculation	2019-02-15	2019-02-15	cbv7		
pH @ 18.4°C			S.U.	8.14	S.U.	EPA 9045	2019-02-14	2019-02-14	jsa6	(A)	
Percent Solids		0.01	%	85.18	%	SM 2540 G	2019-02-13	2019-02-14	jsp2	(A)	



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 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Total Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B901001										
Blank (B901001-BLK1)										
					Prepared: 2019-02-13 Analyzed: 2019-02-14					
Mercury	<	0.000004	mg/kg wet							U
LCS (B901001-BS1)										
					Prepared: 2019-02-13 Analyzed: 2019-02-14					
Mercury	0.001	0.000004	mg/kg wet	0.00100		108	80-120			
Matrix Spike (B901001-MS1)										
					Source: 1545274-01		Prepared: 2019-02-13 Analyzed: 2019-02-14			
Mercury	3.5	0.01	mg/kg dry	3.10	0.08	110	80-120			
Matrix Spike Dup (B901001-MSD1)										
					Source: 1545274-01		Prepared: 2019-02-13 Analyzed: 2019-02-14			
Mercury	3.2	0.01	mg/kg dry	2.99	0.08	104	80-120	8.53	20	
Batch B901003										
Blank (B901003-BLK1)										
					Prepared & Analyzed: 2019-02-13					
Barium	<	0.002	mg/kg wet							U
Cadmium	<	0.004	mg/kg wet							U
Calcium	<	0.2	mg/kg wet							U
Chromium	<	0.01	mg/kg wet							U
Copper	<	0.006	mg/kg wet							U
Iron	<	0.05	mg/kg wet							U
Lead	<	0.03	mg/kg wet							U
Magnesium	<	0.05	mg/kg wet							U
Manganese	<	0.004	mg/kg wet							U
Molybdenum	<	0.005	mg/kg wet							U
Nickel	<	0.007	mg/kg wet							U
Phosphorus	<	0.03	mg/kg wet							U
Potassium	0.08	0.08	mg/kg wet							J
Silver	<	0.004	mg/kg wet							U
Sodium	0.05	0.03	mg/kg wet							J
Sulfur	0.08	0.03	mg/kg wet							J
Zinc	<	0.02	mg/kg wet							J



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CITY OF LARAMIE WWTP - 34024
 PO BOX C
 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Total Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B901003

LCS (B901003-BS1)

Prepared & Analyzed: 2019-02-13

Barium	1.02	0.002	mg/kg wet	1.00		102	80-120			
Cadmium	0.97	0.004	mg/kg wet	1.00		97.3	80-120			
Calcium	51.45	0.2	mg/kg wet	51.0		101	80-120			
Chromium	0.97	0.01	mg/kg wet	1.00		97.0	80-120			
Copper	1.95	0.006	mg/kg wet	2.00		97.4	80-120			
Iron	1.97	0.05	mg/kg wet	2.00		98.7	80-120			
Lead	0.98	0.03	mg/kg wet	1.00		98.5	80-120			
Magnesium	20.46	0.05	mg/kg wet	21.0		97.4	80-120			
Manganese	1.96	0.004	mg/kg wet	2.00		97.8	80-120			
Molybdenum	2.00	0.005	mg/kg wet	2.00		100	80-120			
Nickel	0.98	0.007	mg/kg wet	1.00		98.4	80-120			
Phosphorus	21.05	0.03	mg/kg wet	20.0		105	80-120			
Potassium	29.87	0.08	mg/kg wet	30.0		99.6	80-120			
Silver	0.99	0.004	mg/kg wet	1.00		99.2	80-120			
Sodium	6.11	0.03	mg/kg wet	6.00		102	80-120			
Sulfur	5.11	0.03	mg/kg wet	5.00		102	80-120			
Zinc	1.95	0.02	mg/kg wet	2.00		97.4	80-120			

Matrix Spike (B901003-MS1)

Source: 1545274-01

Prepared & Analyzed: 2019-02-13

Barium	299.1	0.4	mg/kg dry	197	98.39	102	75-125			
Cadmium	182.0	0.7	mg/kg dry	197	0.77	92.1	75-125			
Chromium	195.1	2.4	mg/kg dry	197	11.57	93.2	75-125			
Copper	486.7	1.2	mg/kg dry	394	115.1	94.4	75-125			
Iron	5199	9.9	mg/kg dry	394	4633	144	75-125			
Lead	189.6	5.2	mg/kg dry	197	<	96.3	75-125			MI
Manganese	578.8	0.8	mg/kg dry	394	210.4	93.6	75-125			
Molybdenum	383.5	1.0	mg/kg dry	394	5.45	96.0	75-125			
Nickel	193.4	1.3	mg/kg dry	197	10.98	92.7	75-125			
Silver	187.2	0.9	mg/kg dry	197	<	95.1	75-125			
Zinc	652.5	3.9	mg/kg dry	394	280.3	94.6	75-125			



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 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Total Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B901003

Matrix Spike Dup (B901003-MSD1)

Source: 1545274-01

Prepared & Analyzed: 2019-02-13

Barium	304.8	0.4	mg/kg dry	197	98.39	105	75-125	1.87	20	
Cadmium	184.2	0.7	mg/kg dry	197	0.77	93.1	75-125	1.24	20	
Chromium	200.3	2.4	mg/kg dry	197	11.57	95.8	75-125	2.66	20	
Copper	494.9	1.2	mg/kg dry	394	115.1	96.4	75-125	1.68	20	
Iron	5228	9.9	mg/kg dry	394	4633	151	75-125	0.546	20	MI
Lead	185.5	5.2	mg/kg dry	197	<	94.2	75-125	2.18	20	
Manganese	583.5	0.8	mg/kg dry	394	210.4	94.7	75-125	0.817	20	
Molybdenum	389.2	1.0	mg/kg dry	394	5.45	97.4	75-125	1.47	20	
Nickel	194.9	1.3	mg/kg dry	197	10.98	93.4	75-125	0.799	20	
Silver	189.6	0.9	mg/kg dry	197	<	96.2	75-125	1.26	20	
Zinc	656.3	3.9	mg/kg dry	394	280.3	95.4	75-125	0.580	20	

Batch B901005

Blank (B901005-BLK1)

Prepared: 2019-02-13 Analyzed: 2019-02-14

Arsenic	0.0002	0.00002	mg/kg wet							J
Selenium	0.0007	0.00008	mg/kg wet							J

LCS (B901005-BS1)

Prepared: 2019-02-13 Analyzed: 2019-02-14

Arsenic	0.20	0.00002	mg/kg wet	0.200		102	80-120			
Selenium	0.21	0.00008	mg/kg wet	0.200		103	80-120			

Matrix Spike (B901005-MS1)

Source: 1545274-01

Prepared: 2019-02-13 Analyzed: 2019-02-14

Arsenic	48.26	0.05	mg/kg dry	39.3	7.07	105	75-125			
Selenium	47.44	0.2	mg/kg dry	39.3	6.53	104	75-125			

Matrix Spike Dup (B901005-MSD1)

Source: 1545274-01

Prepared: 2019-02-13 Analyzed: 2019-02-14

Arsenic	46.98	0.05	mg/kg dry	39.3	7.07	101	75-125	2.69	20	
Selenium	44.91	0.2	mg/kg dry	39.3	6.53	97.6	75-125	5.48	20	



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CITY OF LARAMIE WWTP - 34024
 PO BOX C
 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Environmental Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B900996										
Blank (B900996-BLK1)										
				Prepared: 2019-02-13 Analyzed: 2019-02-14						
Percent Solids	99.96	0.01	%							
LCS (B900996-BS1)										
				Prepared: 2019-02-13 Analyzed: 2019-02-14						
Percent Solids	97.35	0.01	%	97.4		99.9	80-120			
Duplicate (B900996-DUP1)										
				Source: 1546465-01		Prepared: 2019-02-13 Analyzed: 2019-02-14				
Percent Solids	64.35	0.01	%		66.22			2.86	20	
Duplicate (B900996-DUP2)										
				Source: 1546545-01		Prepared: 2019-02-13 Analyzed: 2019-02-14				
Percent Solids	21.20	0.01	%		21.44			1.13	20	
Batch B901016										
Blank (B901016-BLK1)										
				Prepared & Analyzed: 2019-02-14						
Ammonia as N	<	10.0	mg/kg wet							
LCS (B901016-BS1)										
				Prepared & Analyzed: 2019-02-14						
Ammonia as N	2781	125	mg/kg wet	3000		92.7	85-115			
Matrix Spike (B901016-MS1)										
				Source: 1545814-04		Prepared & Analyzed: 2019-02-14				
Ammonia as N	1811	29.3	mg/kg dry	587	1169	109	80-120			
Matrix Spike Dup (B901016-MSD1)										
				Source: 1545814-04		Prepared & Analyzed: 2019-02-14				
Ammonia as N	1860	29.3	mg/kg dry	587	1169	118	80-120	2.62	20	
Batch B901031										
Blank (B901031-BLK1)										
				Prepared & Analyzed: 2019-02-14						
Nitrate/Nitrite Nitrogen	<	0.2	mg/kg wet							



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 LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Environmental Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B901031										
LCS (B901031-BS1) Prepared & Analyzed: 2019-02-14										
Nitrate/Nitrite Nitrogen	19.59	1.0	mg/kg wet	20.0		97.9	85-115			
Matrix Spike (B901031-MS1) Source: 1545320-01 Prepared & Analyzed: 2019-02-14										
Nitrate/Nitrite Nitrogen	1149	25.0	mg/kg dry	500	711.6	87.6	80-120			
Matrix Spike (B901031-MS2) Source: 1545814-04 Prepared & Analyzed: 2019-02-14										
Nitrate/Nitrite Nitrogen	56.49	1.0	mg/kg dry	20.0	39.97	82.6	80-120			
Matrix Spike Dup (B901031-MSD1) Source: 1545320-01 Prepared & Analyzed: 2019-02-14										
Nitrate/Nitrite Nitrogen	1162	25.0	mg/kg dry	500	711.6	90.1	80-120	1.09	20	
Matrix Spike Dup (B901031-MSD2) Source: 1545814-04 Prepared & Analyzed: 2019-02-14										
Nitrate/Nitrite Nitrogen	55.56	1.0	mg/kg dry	20.0	39.97	78.0	80-120	1.66	20	
Batch B901038										
LCS (B901038-BS1) Prepared & Analyzed: 2019-02-14										
pH @ 18.4°C	7.32		S.U.	7.16		102	85-115			
Duplicate (B901038-DUP1) Source: 1545274-01 Prepared & Analyzed: 2019-02-14										
pH @ 19.4°C	5.98		S.U.		5.97			0.167	20	
Batch B901067										
Blank (B901067-BLK1) Prepared & Analyzed: 2019-02-15										
Total Kjeldahl Nitrogen	<	100	mg/kg wet							



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Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Environmental Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B901067										
LCS (B901067-BS1)										
				Prepared & Analyzed: 2019-02-15						
Total Kjeldahl Nitrogen	4261	250	mg/kg wet	4600		92.6	85-115			
Matrix Spike (B901067-MS1)										
				Source: 1546545-02						
				Prepared & Analyzed: 2019-02-15						
Total Kjeldahl Nitrogen	65390	95.7	mg/kg dry	12000	53510	99.3	80-120			
Matrix Spike Dup (B901067-MSD1)										
				Source: 1546545-02						
				Prepared & Analyzed: 2019-02-15						
Total Kjeldahl Nitrogen	65010	95.7	mg/kg dry	12000	53510	96.2	80-120	0.572	20	



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Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
 2019-02-15 20:18

Certified Analyses included in this Report

Method	Analyte	Certifications
<i>EPA 353.2 in Solid</i>	Nitrate/Nitrite Nitrogen	IA,FL
<i>EPA 6010B in Solid</i>	Barium	TX,KS,FL,UT,OK,IA,WA
	Cadmium	TX,KS,FL,UT,OK,IA,WA
	Calcium	TX,KS,IA,FL
	Chromium	TX,KS,FL,UT,OK,IA,WA
	Copper	TX,KS,FL,UT,OK,IA,WA
	Iron	FL,KS,TX,UT,OK,IA,WA
	Lead	FL,KS,TX,UT,OK,IA,WA
	Magnesium	FL,TX,KS,UT,OK,IA,WA
	Manganese	FL,KS,TX,UT,OK,IA,WA
	Molybdenum	TX,KS,FL,UT,IA,OK,WA
	Nickel	FL,KS,TX,UT,OK,IA,WA
	Phosphorus	FL,KS,TX,UT,OK,IA,WA
	Potassium	FL,KS,TX,UT,OK,IA,WA
	Silver	FL,KS,TX,UT,OK,IA,WA
	Sodium	FL,KS,TX,UT,OK,IA,WA
	Zinc	FL,KS,TX,UT,IA,WA
<i>EPA 6020 in Solid</i>	Arsenic	IA,KS,FL
	Selenium	KS,IA,FL
<i>EPA 7471 in Solid</i>	Mercury	TX,KS,FL,UT,OK,IA,WA
<i>EPA 9045 in Solid</i>	pH	FL,OK,KS,WA
<i>PAI-DK 01 in Solid</i>	Total Kjeldahl Nitrogen	IA,FL
<i>SM 2540 G in Solid</i>	Percent Solids	FL,IA,WA
<i>SM 4500-NH3 C-1997 in Solid</i>	Ammonia as N	FL

Non-Certified Analyses included in this Report

Method	Analyte
<i>EPA 6010B in Solid</i>	Sulfur

Code	Description	Number	Expires
FL	Florida Department of Health	E87918	06/30/2019
IA	Iowa Department of Natural Resources	064	05/01/2019
KS	Kansas Department of Health and Environment	E-10402	04/30/2019
NE	State of Nebraska Dept of Health & Human Services	NE-04-05	06/30/2019
OK	Oklahoma Department of Environmental Quality	2018-118	08/31/2019
TX	Texas Commission on Environmental Quality	T104704416-18-12	07/31/2019
TX-B	Texas Commission on Environmental Quality	T104704546-18-2	07/31/2019
UT	State of Utah Department of Health	NE000012018-8	07/31/2019
WA	State of Washington Department of Ecology	C912	06/07/2019

Work Order: 1545814

The result(s) issued on this report only reflect the analysis of the sample(s) submitted. For applicable test parameters, Midwest Laboratories is in compliance with NELAC requirements. Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.



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CITY OF LARAMIE WWTP - 34024
PO BOX C
LARAMIE, WY 82073

Project: 503 Regs for Biosolids

Project Manager: KARLA ADAMI

Reported:
2019-02-15 20:18

Notes and Definitions

- U Analyte included in the analysis, but not detected
- MI Matrix interference suspected in matrix spiked sample.
- J Estimated value
- < Less than reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

EPA 524.2, EPA 624, EPA 8260, OA-1, TCLP VOC, GRO, and all microbiological analyses are conducted in the facility located at 13606 B Street, Omaha, NE 68144. All other analyses are conducted in the main facility located at 13611 B Street, Omaha, NE 68144.



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CHAIN OF CUSTODY

Lab Work Order Number: 1545814
 Date Generated: 01/15/2019

Client Name CITY OF LARAMIE WWTP - 34024		Project Name 503 Regs for Biosolids		Requested Analyses (Test Names)					Copy To:	
Client Contact KARLA ADAMI		Project Description		503 Regulations Ag, As, M, Ba, Ca, Cd, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, P, Pb, S, Se, M, Zn	Ammonia-Titration, Nitrate/Nitrite, Percent Solids, PH, TKN-Titration					
Address PO BOX C		Purchase Order Number								
City LARAMIE		Midwest Labs Contact Robert Ferris								
State/Zip WY, 82073		Regulatory (Circle One) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								
Phone 3077215204		Regulatory Agency EPA								
Fax 307-721-3077		Sample Type (Circle One - See Below) D G W <input checked="" type="checkbox"/> U P							Email to:	
Sampler Name (printed) KARLA ADAMI										

Lab ID	Sample Name or Field ID	Sampled Date	Sampled Time	Sample Code	Matrix Code	Container Count	Preservation Code					Sample Comments	
01	01	2-11-19	12pm	S/H	S	2	11	2	1				
02	02	↓	↓	S/H	S	2	1	2	2				
03	03	↓	↓	S/H	S	2	1	2	2				
04	04	↓	↓	S/H	S	2	1	2	2				

WORKORDER: **1545814**
COC
 Sticker #: 1

Relinquished By <i>Karla Adami</i>	Date/Time 2-11-19 2pm	Received By <i>AA</i>	Date/Time 2/12/19	Date/Time 1030	Lab Internal Use Only:
Relinquished By	Date/Time	Received By	Date/Time	Date/Time	Temperature Upon Receipt: <u>8.0°</u>
Comments:					Cooler Numbers:
					Notes:

Matrix Codes: S=Solid
 Preservation Codes: 1=Cool 6°C, 11=[Group Analysis], 2=None
 Sample Type Codes: D = Drinking Water (Safe Drinking Water Act), G = Groundwater, W = Wastewater (Clean Water Act), S/H = Solid/Hazardous Waste (RCRA), U = Underground Storage Tank (UST), P = Process Water

Chain of Custody will have a signature upon receipt but no subsequent signatures.



Work Order 1545814



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WORKORDER: 1545814
COC
Sticker #: 2



Regulatory

This sheet **MUST** be filled out before samples can be processed. To ensure that holding times are met, it is your responsibility that a completed form comes attached to the Chain of Custody. **Samples must be received on ice.**

Is this sample for regulatory/permit reporting? Yes No

What city/state was your sample collected in? Laramie, Wyoming

What agency/state are you reporting to? EPA

What type of sample? (Circle One)

Drinking Water	Ground Water	Wastewater
Solid waste	Hazardous Waste	UST
Storm Water	Process Water	

SEE REVERSE SIDE FOR SAMPLING INSTRUCTIONS

RC FORM 14-2 Effective 07/01/16

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Lab Number: _____

Thermometer Used: Therm Fisher IR 14

Sample Temperature (°C): 8.5

Cooler Intact: Yes No
 Received on Ice: Yes No
 Hand Delivered: Yes No

Date & Initials of person accepting samples: Ac 2/12/19


Comments

Chain of Custody present?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Sample ID(s):	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Sample Location(s):	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Client contact:	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Analysis Requested:	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Date & Time of collection:	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Sampler name on COC?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Chain of custody relinquished with signature?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Chain of custody complete?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Sample labels match COC?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Written in indelible ink?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Labels indicate proper preservation?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Samples arrived within hold time?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<u>Salmonella expired</u>
Samples arrived within correct temperature?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Sufficient volume?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Appropriate containers used?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	
Headspace in VOA vials?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	
Trip Blank present?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	

Client Notification/Resolution: Date/Time Contacted: _____

Person Contacted: _____ Contacted By: _____

Comments/Resolution: _____



1545814
COC
Sticker #: 3

