



State of Oregon
Department of Environmental Quality
700 NE Multnomah St. Suite 600, Portland, OR 97232

DEQ use only

Wastewater Solids and Biosolids Annual Report

Part I: Wastewater solids production and disposition

Part I: Must be completed by all domestic wastewater facilities.

A. REPORTING PERIOD

1. This report is for biosolids produced during the calendar year: 2018

B. PERMIT INFORMATION

1. Permit Type (select one): ☒ NPDES or ☐ WPCF DEQ File No.: 89103
DEQ Permit No.: 101713 EPA Permit No.: OR-002086-9

C. FACILITY INFORMATION

1. Legal name of facility: City of Toledo WWTP

Physical address

2. Street Address: 1105 SE Fir st

City: toledo State: or Zip code: 97391

Mailing address ☐ Same as physical address.

3. Mailing Address: PO Box 220

City: toledo State: or Zip code: 97391

Facility Type (check all that apply)

4. ☐ Major or Tier 1 facility (design flow of 1 mgd or greater, or serving a population of 10,000 or greater)
☒ Minor or Tier 2 facility (design flow less than 1 mgd or serving a population less than 10,000)
☐ Class I wastewater treatment facility (i.e., facility with a pre-treatment program)
☐ Biosolids only facility
☐ Lagoon treatment system
☐ Other, please specify:

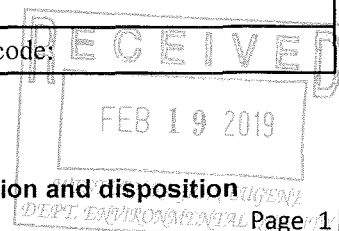
D. CONTACT INFORMATION

Responsible official

1. Name: Matt MacPhail Title: Senior Operator
Email Address: wwtp@cityoftoledo.org Telephone: 541 336 2138
Mailing Address: PO Box 220
City: toledo State: or Zip code: 97391

Biosolids contact ☒ Same as responsible official

2. Name: Title:
Email Address: Telephone:
Mailing Address:
City: State: Zip code:



E. WASTEWATER SOLIDS RECEIVED

Please indicate if you received wastewater solids or hauled from other facilities for processing.

Did you receive wastewater solids or hauled waste from other facilities? ☐ Yes ☒ NO

If you received unprocessed wastewater solids, please list sources below. All weight values should be reported in US tons. (US ton= 2,000 lbs) Attach additional pages if necessary.

Name	Type	Quantity	Units (choose one)	% solids
1.	☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%
	☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%
	☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%
	☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%
	☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%

F. WASTEWATER SOLIDS TREATMENT PROCESSES

Please indicate the solids treatment processes used at your facility (mark all that apply)

Thickening technology	Stabilization Technology	Dewatering technology
☒ Gravity ☐ DAF ☐ Centrifugation ☐ Other:	☒ Aerobic digestion ☐ Anaerobic digestion ☐ Lime stabilization ☐ ATAD ☐ Composting ☐ Thermal ☐ Lagoon ☐ Other: cannibalization	☐ Belt press ☐ Plate and frame press ☐ Screw press ☐ Centrifuge ☐ Vacuum filter ☐ Drying beds ☐ Heat drying ☒ Other: cannibalization

Dry tons = wet tons x %solids

Dry tons = $\frac{(\text{gal} \times \% \text{solids} \times 8.34)}{100} \times 0.0005$

G. WASTEWATER SOLIDS DISPOSITION

Please indicate how wastewater solids were managed at your facility. Please specify reporting units. All weight values should be reported in US tons. US ton.= 2,000 lbs

Disposition of wastewater solids	Quantity (choose one)			% solids
1. ☒ Treated and land applied, sold, or given-away as biosolids or biosolids-derived products	Gallons	Wet tons	Dry Tons 46.07	0.00%
2. ☐ Sent to landfill. Name:	Gallons	Wet tons	Dry Tons	0.00%
3. ☐ Sent to another permitted facility for treatment. Name:	Gallons	Wet tons	Dry Tons	0.00%
4. ☐ Long-term storage at treatment facility (e.g., lagoon, drying bed, etc.)*	Gallons	Wet tons	Dry Tons	0.00%
5. ☐ Other. Please specify:	Gallons	Wet tons	Dry Tons	0.00%

* If you operate a lagoon system and do not have accurate data on the quantity of solids in your lagoon, please check the box for long-term storage, but you may leave the quantity and other information blank.

H. LAGOON SYSTEM OPERATION and MAINTENANCE

The following section is required for facilities that operate wastewater treatment lagoons.

1. A survey of wastewater solids have been completed within the last year: ☐ Y ☐ N

2. In what year were solids last removed from the lagoon:

3. When do you estimate the next solids removal? Select only one of the following:

- ☐ Within the next calendar year
☐ Within the next 5 years
☐ Greater than 5 years from present

I. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

I certify that the information in this report is true and correct to the best of my knowledge and belief. Information and records used or referenced with this report will be maintained and made available to the Oregon Department of Environmental Quality on request.

Signature

Title

Date

Print Name:



Wastewater Solids and Biosolids Annual Report

Part II: Biosolids production and quality

Part II: Must be completed by facilities that produced Class A or Class B biosolids for land application, or sold or gave away biosolids derived products for distribution and marketing.

J. BIOSOLIDS PRODUCTION and DISPOSITION			
Please specify quantity (in dry US tons) of finished biosolids stored or produced at your facility.			
		Class A	Class B
1.	Produced during reporting period		
			46.07
	Total biosolids production	0	0
Please indicate how finished biosolids were managed (i.e., land applied, sold, stored, or other).			
		Class A	Class B
	Land applied in bulk to agricultural land		46.07
	Land applied in bulk to forest land		
	Land applied in bulk to reclamation site		
	Land applied in bulk to a public contact site (e.g., park, roadside golf course)		
2.	Sold or given away as feedstock for a biosolids-derived product		
	Sold or given away in bags or other containers		
	Carried-over into next year (i.e., onsite storage)		
	Sent to landfill		
	Other, please specify:		
	Total biosolids disposition (add above lines)	0	46.07

K. BIOSOLIDS SAMPLING

Select your facility's minimum regulatory monitoring frequency (select only one box):

Monitoring frequency	☒ Once per year	☐ Once per quarter (four times per year)	☐ Once per 60 days (six times per year)	☐ Once per month (12 times per year)
Metric tons	<290	290 > 1,500	1,500 > 15,000	≥ 15,000
US Tons	<319	319 > 1,650	1,650 > 16,500	≥ 16,500

Provide details on compliance sampling.

Sample type - Annual - Quarterly - 60 days - Monthly	Class	Processes (select all that apply)			Sampling date	
					Pollutants	Nutrients
Annual	☐ A ☒ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	5/31/18	5/31/18
Click Arrow	☐ A ☒ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	5/4/18	
Click Arrow	☐ A ☒ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	5/5/18	
Click Arrow	☐ A ☒ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	6/1/18	
Click Arrow	☒ A ☐ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	6/2/18	
Click Arrow	☐ A ☐ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	4/26/18	
Click Arrow	☐ A ☒ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	5/3/18	
Click Arrow	☐ A ☒ B	☒ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☒ Other	9/7/18	
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		

L. BIOSOLIDS POLLUTANT MONITORING

Report pollutant monitoring data from collected samples. Express results in mg/kg (ppm) based on dry wt. Please attach laboratory reports for results only. No lab QA/QC.

Biosolid Type: Class A ☐ Class B ☒

Sample type	Average Pollutant Concentrations								
- Annual - Quarterly - 60 days - Monthly	As (mg/kg)	Cd (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Mo (mg/kg)	Ni (mg/kg)	Se (mg/kg)	Zn (mg/kg)
Annual	6.64	1.87	252	32.8	.661	5.19	18.8	5.32	570
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Click Arrow									
Annual Mean									
Table 1¹ Ceiling conc.	75	85	4300	840	57	75	420	100	7500
Table 3² Pollutant conc.	41	39	1500	300	17	N/A	420	100	2800

¹ 40 CFR § 503.13 Table 1 – Ceiling concentrations. Samples with pollutant concentrations that exceed the Table 1 limits are not eligible for land application and must be disposed by other means.

² 40 CFR § 503.13 Table 3 – Pollutant Concentrations. Samples with pollutant concentrations that exceed the Table 3 limits are subject to cumulative pollutant loading rates in 40 CFR § 503.13 Table 2. Annual and cumulative pollutant additions to land application sites must be submitted with the annual report.

M. BIOSOLIDS NUTRIENT MONITORING

Report nutrient monitoring data from collected samples. Express results in mg/kg (ppm) based on dry weight, except where otherwise noted. Please attach laboratory reports for results only. No lab QA/QC.

Biosolid Type: Class A ☐ Class B ☒

1.	Sample type	Average Nutrient Concentrations							F. coli MPN ☐ CFU ☒
	- Annual - Quarterly - 60 days - Monthly	TKN (mg/kg)	NO ₃ -N (mg/kg)	NH ₄ -N (mg/kg)	P (mg/kg)	K (mg/kg)	pH (S.U.)	Total solids (%)	
	Annual	4.65	.042	.328	2.98	2090	6.5	3.72	
	Click Arrow								1
	Click Arrow								1
	Click Arrow								1
	Click Arrow								1
	Click Arrow								1
	Click Arrow								1
	Click Arrow								1
	Click Arrow								
	Click Arrow								
	Click Arrow								
	Click Arrow								
	Annual Mean								

N. BIOSOLIDS PATHOGEN REDUCTION MONITORING and RECORDS

Identify alternative(s) used to meet Class A or Class B pathogen reduction (PR): 40 CFR §503.32
Attach documentation on pathogen reduction.

	Class A Alternatives	Class B Alternatives
1.	Biosolids have been tested for (select one or both): ☐ fecal coliform ☐ salmonella ☐ Alternative 1: Thermally treated biosolids ☐ Alternative 2: Biosolids treated in a high pH-high temperature process ☐ Alternative 3: Biosolids treated in other processes that meet enteric virus and helminth ova criteria. ☐ Alternative 4: Biosolids treated in unknown processes that meet enteric virus and helminth ova criteria. ☐ Alternative 5: Use of a Process to Further Reduce Pathogens (PFRP) (select all that apply) ☐ (a) Composting ☐ (b) Heat drying ☐ (c) Heat treatment ☐ (d) Thermophilic aerobic digestion ☐ (e) Beta ray irradiation ☐ (f) Gamma ray irradiation ☐ (g) Pasteurization ☐ Alternative 6: Use of a Process equivalent to a PFRP. Identify:	☒ Alternative 1: Monitoring of fecal coliform as the geometric mean of the density of fecal coliform of seven representative samples (select option met): ☐ < 2 million Most Probable Number (MPN) per gram of solids (dry wt. basis) ☒ < 2 million Colony Forming Units (CFU) per gram of total solids (dry wt. basis) ☐ Alternative 2: Biosolids treated in one of the Processes to Significantly Reduce Pathogens (PSRP) described below: ☒ (a) Aerobic digestion ☐ (b) Air drying ☐ (c) Anaerobic digestion ☐ (d) Composting ☒ (e) Lime stabilization ☐ Alternative 3: Biosolids treated in a process that is equivalent to a PSRP. Identify:

O. BIOSOLIDS VECTOR ATTRACTION REDUCTION and RECORDS

Identify option(s) used to meet vector attraction reduction (VAR): 40 CFR §503.33
Attach documentation demonstrating compliance.

In-plant options:

- ☒ Option 1: 38% reduction in volatile solids content. Select method used for determining volatile solids reduction:
- ☐ Full mass balance equation
 - ☐ Approximate mass balance equation
 - ☐ Van Kleeck equation
 - ☒ Volatile solids loss across all sewage sludge treatment processes
- ☐ Option 2: Bench-scale anaerobic digestion for 40 additional days at 30 °C to 37 °C.
- ☐ Option 3: Bench-scale aerobic digestion for 30 additional days at 20 °C.
1. ☐ Option 4: SOUR at 20 °C. (Only for material <2% solids with no dilution.)
- ☐ Option 5: Aerobic treatment for at least 14 days over 40 °C with an average temperature of over 45 °C.
- ☐ Option 6: Alkali addition to raise pH to at least 12 at 25 °C and maintain a pH ≥ 12 for 2 hours and a pH ≥ 11.5 for 22 more hours.
- ☐ Option 7: Drying with no unstabilized (primary) solids to at least 75% solids.
- ☐ Option 8: Drying with unstabilized (primary) solids to at least 90% solids.

Site management options:

- ☐ Option 9: Injection with no biosolids present on land surface 1 hour after injection. (Class A biosolids only: Injection within 8 hours of pathogen reduction.)
- ☐ Option 10: Incorporation within 6 hours of application. (Class A biosolids only: Incorporation within 8 hours of pathogen reduction.)

If VAR was met through Option 1, a 38% reduction in volatile solids, report the average reduction percentage found.

Biosolid Type	Average Volatile Solid Reduction
2. Class A	0.00%
Class B	45
	0.00%
	0.00%

P. VIOLATIONS OF 40 CFR §503 or OAR CHAPTER 340 DIVISION 50

Did any violations of 40 CFR §503 or OAR Chapter 340 Division 50 occur during the reporting period?

- ☒ No.
- ☐ Yes. Provide a detailed description of the violation(s) and remedial actions taken to prevent reoccurrences in the future. If this was a spill, please include the OARS report #.

Q. SUMMARY OF PART II ATTACHMENTS

Information DEQ requests with all annual reports:

1. ☐ Analytical laboratory reports for pollutant monitoring. No lab QA/QC
☐ Analytical laboratory reports for nutrient monitoring. No lab QA/QC
☐ Documentation to demonstrate compliance with pathogen reduction requirements.
☐ Documentation to demonstrate compliance with vector attraction reduction requirements.

Information required if pollutants in Section L exceed Table 3 values:

2. ☐ Annual and cumulative pollutant additions to land application sites, if any pollutant concentration exceeds the Table 3 values.

Optional and supplemental information:

3. ☐ Other information on changes to solids handling or land application site management.
☐ Other information on biosolids violations and remedial actions.
☐ Other. Please specify:

R. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in 40 CFR §503.32 (identified in Section P of this report) and the vector attraction reduction requirements in 40 CFR §503.33 (identified in Section Q of this report) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.


Signature

senior operator

Title

2/15/19

Date

Print Name: Matt MacPhail



State of Oregon
Department of Environmental Quality
700 NE Multnomah St. Suite 600, Portland, OR 97232

DEQ use only

Wastewater Solids and Biosolids Annual Report

Part III: Biosolids land application site information

Part III: Must be completed by facilities that land applied Class B biosolids during the reporting period.
Add additional pages as needed.

S. LAND APPLICATION SITE INFORMATION

	Site ID	Owner (Last Name)	Location, PLSS (Township, Range, Section, Tax Lot)	Crop(s)	Appl. rate (lbs N/ac)	Total applied (DT/site)*	Total area applied (acres)	Was site applied to the previous year?	Soil test**
1.	Hughes	Hughes	0 of sec 4 & 33, 200 of sec 11, t10s, r9w	hay	32.3	8.84	7.1	☒ Yes ☐ No	☒ y
2.	Kosydar 1	Kosydar	t.l. 100 of sec 21, t9s, r10w w.m.	hay	39.8	17.68	11.5	☒ Yes ☐ No	☒ y
3.	wr2017-21-bs	Kosydar	t 9n, r 10w sec 21	hay	27.1	19.55	18.7	☐ Yes ☒ No	☒ y
4.								☐ Yes ☐ No	☐
5.								☐ Yes ☐ No	☐
6.								☐ Yes ☐ No	☐
7.								☐ Yes ☐ No	☐
8.								☐ Yes ☐ No	☐
9.								☐ Yes ☐ No	☐
10.								☐ Yes ☐ No	☐
11.								☐ Yes ☐ No	☐
12.								☐ Yes ☐ No	☐
13.								☐ Yes ☐ No	☐
14.								☐ Yes ☐ No	☐
15.								☐ Yes ☐ No	☐

Attach additional pages as required to report on all sites that received class B biosolids during the reporting period.

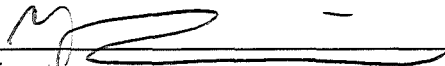
* Please report in units of dry US tons (US ton = 2,000 lbs)

** Please attach laboratory report showing sample results only. No lab QA/QC.

T. SUMMARY OF PART III ATTACHMENTS

1.	Information required with some annual reports:
	☐ Additional copies of Table S for additional land application. ☐ Analytical results from soil testing
2.	Example of documentation held by the permittee and available upon request:
	☐ Additional land application site information. ☐ Figures showing where biosolids were applied. ☐ Nitrogen loading calculations

U. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

	I certify, under penalty of law, that the information that will be used to determine compliance with the site restrictions in Sec. 503.32(b)(5) for each site on which Class B sewage sludge was applied was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.	
	 _____	senior operator _____
	Signature	Title
	Print Name: Matt MacPhail	
	_____	2/15/19 _____ Date

City of TOLEDO Class B Biosolid Certification Statement

I certify, under penalty of law, that the information used to determine compliance with the Class B Pathogen Reduction requirements in 40 CRF part 503.32(b)(2) and the Vector Attraction Reduction requirements in 40 CRF part 503.33(b)(3) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluated this information. I certify that all Class B biosolids land applied have met the above mentioned Pathogen and Vector Attraction Reduction requirements. I also certify that all Class B biosolids were land applied at agronomic rates. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Date: 2-15-19

Name: Matt MacPhail

Position: Senior Engineer

Signature



Screening: Heli-sleeve removes particles and discharges to a dumpster that is emptied weekly and taken to a landfill.

Grit removal: Pista grit removes grit and discharges to a dumpster that is emptied weekly and taken to a landfill.

Settling, Thickening, Digestion, and Dewatering: Sludge is settled in three stages. First, during the cannibalization process, sludge is settled in an anaerobic environment, and sludge is pumped from the bottom back into the aerobic zone, while clear water is pumped off the top to another process. After sludge is thickened some, it is pumped up to the aerobic digester cell and allowed to aerate for several weeks, after which the air is turned off, and sludge allowed to settle, clear water is then pumped off to another process. After the sludge meets its Vector Attraction Reduction parameters, it is pumped to a storage tank, where water is removed again, before being put into the hauling truck and taken out for land application.

VAR: Sludge is thickened in the primary digester using a cannibalization process for several weeks. When operators notice a visible thickening, sludge is then transferred to an aerobic digester cell, where it is allowed to aerate for at least two weeks, after which air is shut off, and the sludge is allowed to settle, with clear water pumped off. A sample is then taken, and SOUR, pH, temp, TSS, and VSS are run. If the sludge meets SOUR <1.5 and VSS reduction of at least 38%, then lime is added to bring up the pH to 6.5, after which it is deemed ready to haul, and pumped to a storage tank.

City of Toledo WWTP
Fecal Coliform Test SM9222

Date	5-4-18	Location	huc1
Time	11:00 A	Sampler	DV
Sample pH	6.5	Sample T	16.8 °C

mls filtered	Colony Count	Remarks
3	0	
10	0	
10	0	

Tester	mm	Colonies/100ml	0
Date/Time	5-4-18 11:30 A		
Lot #	A8099 exp. 3/19		
Cl2	—	FTU	—

Date	5-5-18	Location	huc1
Time	10:30 A	Sampler	DV
Sample pH	6.5	Sample T	16.9 °C

mls filtered	Colony Count	Remarks
3	0	
10	0	
10	0	

Tester	mm	Colonies/100ml	0
Date/Time	5-5-18 11:00 A		
Lot #	A8099 exp 3/19		
Cl2	—	FTU	—

City of Toledo WWTP
Fecal Coliform Test SM9222

Date	6-1-18	Location	h ₂ l
Time	10:40 A	Sampler	DJN
Sample pH	6.3	Sample T	16.5° C

mls filtered	Colony Count	Remarks
3	1	
10	0	
10	1	10

Tester	MM	Colonies/100ml	
Date/Time	6-1-18 11:50 A		
Lot #	A8099 exp 3/19		
Cl2	-	FTU	-

Date	6-2-18	Location	h ₂ l
Time	10:20 A	Sampler	DJN
Sample pH	6.5	Sample T	16.5° C

mls filtered	Colony Count	Remarks
3	0	
10	0	
10	0	

Tester	MM	Colonies/100ml	
Date/Time	6-2-18 10:50 A		
Lot #	A8099 exp 3/19		
Cl2	-	FTU	-

City of Toledo WWTP
Fecal Coliform Test SM9222

Date	4-26-18	Location	hurl
Time	7:00 AM - 10:00 AM	Sampler	PV
Sample pH	6.6	Sample T	16.0°C

mls filtered	Colony Count	Remarks
3	0	
10	0	
10	0	

Tester	MM	Colonies/100ml	0
Date/Time	4-26-18 11:25 A		
Lot #	A8099 RLP 3/19		
Cl2	-	FTU	-

Date	5-3-18	Location	hurl
Time	1:10 P	Sampler	MM
Sample pH	6.5	Sample T	18.5°C

mls filtered	Colony Count	Remarks
3	0	
10	0	
10	0	

Tester	MM	Colonies/100ml	0
Date/Time	1:50 P 5-3-18		
Lot #	A8099 OLP 3/19		
Cl2	-	FTU	-

**City of Toledo WWTP
Fecal Coliform Test SM9222**

Date	9-7-18	Location	ha-1
Time	11:15 A	Sampler	DY
Sample pH	6.5	Sample T	20.1

mls filtered	Colony Count	Remarks
B	0	
10	0	
10	0 = 1	

Tester	MM	Colonies/100ml
Date/Time	9-7-18 11:20 A	
Lot #		
Cl2	—	FTU

Date		Location	
Time		Sampler	
Sample pH		Sample T	

mls filtered	Colony Count	Remarks

Tester		Colonies/100ml
Date/Time		
Lot #		
Cl2		FTU

9

Tech Initials	Date	Time	Oven Temp	Sample Point	Dish	Sample Volume	Tare	Gross 1	Gross 2	Susp. Solids	
mm	4-26-18	11:15 A	103°F	h4-1	18	3-1	1.4035	1.5367		41.400	58%
		2:12 P	550°F	VSS				1.4586		26.033	
mm	4-27-18	9:10 A	103°F	2A-3	10	3-1	1.4058	1.5300		8.066	25%
		12:45 P	550°F	VSS				1.4118		6.066	
mm	4-27-18	9:25 A	103°F	cell 2	12	3-1	1.4173	1.4766		19.766	64%
		1:20 P	550°F	VSS				1.4384		12.766	
mm	4-27-18	9:40 A	103°F	2A-3	10	3-1	1.4024	1.526		16.400	
		11:20 A	550°F	VSS				1.4357		5.233	
mm	4-28-18	9:00 A	103°F	cell 2	12	3-1	1.4034	1.4647		20.433	61%
		11:30 A	550°F	VSS				1.4253		13.133	
mm	4-28-18	11:32 A	103°F	cell 1	17	3-1	1.4063	1.4676		20.433	62%
		1:50 P	550°F	VSS				1.4295		12.700	
mm	5-3-18	2:10 P	103°F	h4-1	13	3-1	1.4196	1.5332		37.466	54%
		7:13 A	550°F					1.4665		23.233	
mm	5-4-18	2:45 A	103°F	Aqu-1	14	3-1	1.3964	1.5040		35.700	61%
		2:47 P	550°F	VSS				1.4340		21.666	
mm	5-8-18	11:02 A	103°F	h4-1	18	3-1	1.4019	1.5011		33.066	59%
		1:13 P	550°F	VSS				1.4425		14.533	
mm	6-1-18	11:25 A	103°F	h4-1	15	3-1	1.4090	1.5308		40.600	55%
		1:47 P	550°F	VSS				1.4598		23.666	
mm	6-24-18	11:10 A	103°F	h4-1	17	3-1	1.4074	1.5208		37.866	54%
		1:21 P	550°F	VSS				1.4541		22.233	
mm	6-3-18	10:20 A	103°F	h4-1	10	3-1	1.4058	1.5166		36.433	21.00 58%
		12:45 P	550°F	VSS				1.4518		21.600	
mm	6-7-18	12:17 P	103°F	h4-1	14	3-1	1.4189	1.5135		31.533	59%
		3:27 P	550°F	VSS				1.4576		18.633	
mm	7-4-18			FE	5	100ml					
				6E	6	100ml					
				2E	7	500ml					
				8E	8	500ml					
				BB	3	500ml					
mm	9-7-18			h4-1	17	3-1	1.4067				
			6.5 pH	VSS							
mm	9-7-18	11:06 A	103°F	h4-1	1	3-1	1.4217	1.5324		37.066	56%
		1:13 P	550°F	VSS				1.4703		20.700	
DV	9-8-18	11:08 A	103°F	H4-1	1	3ml	1.4208	1.5460		41.733	57%
			550°F	VSS				1.4748		23.733	
DV	9-9-18	11:41	103°F	H4-1	17	3ml	1.4075	1.5177		36.733	56%
			550°F	VSS				1.4562		20.500	

PM DATA ENTRY WORKS

DATE 9.5.18.

LOCATION - DESCRIPTION
PARAMETER

all #1
UNITS

DIG -aerobic digester TU

00010	TEMP-WATER-C	Degrees C	20.3°C
00011	TEMP-WATER-F	Degrees F.	
00300	DISS-OXYGEN	MG/L	
00403	PH-LAB	S.U.	3.6
00530	RESIDUE-TOT NFLT	MG/L	
00535	RESIDUE-VOL NFLT	MG/L	
M90025	OXYGEN-UPTAKE	MG/L/HR	
M91029	LIME-CAOH	LB LS/D	
M91030	LIME-CAO	LB LS/D	
M91070	DAY OF WEEK	NUMBER	
SOUR	SPECIFIC UPTAKE	mgO2/hr/gm	
SPIN	CENTRIFUGE	%	

Good

to

Go

START D.O. 8.61

START Temp 20.3°C

min	DO
1	8.63
2	8.64
3	8.56
4	8.51
5	8.54
6	8.46
7	8.41
8	8.39
9	8.41
10	8.37

$$\frac{.26}{10} \times 60 = 1.56 \text{ OUR}$$

$$\frac{\text{OUR } 1.56 \times 1000}{\text{Dig. VSS } 9100} = .17 \text{ SOUR}$$

$$\frac{.77 - .63}{.77 - (.77 \times .63)} = \frac{.14}{.77 - .48} = \frac{.14}{.29} = .48 \text{ 8 VSS Reduction}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 8.30.18

LOCATION - DESCRIPTION Gll #2
PARAMETER UNITS

DIG -aerobic digester TU
00010 TEMP-WATER-C Degrees C 20.2⁰⁰
00011 TEMP-WATER-F Degrees F.
00300 DISS-OXYGEN MG/L
00403 PH-LAB S.U. 3.0
00530 RESIDUE-TOT NFLT MG/L
00535 RESIDUE-VOL NFLT MG/L
M90025 OXYGEN-UP TAKE MG/L/HR
M91029 LIME-CAOH LB LS/D
M91030 LIME-CAO LB LS/D
M91070 DAY OF WEEK NUMBER
SOUR SPECIFIC UPTAKE mgO2/hr/gm
SPIN CENTRIFUGE %

START D.O. 9.14
START Temp 20.2⁰⁰

min	DO
1	9.09
2	9.04
3	8.97
4	8.89
5	8.88
6	8.85
7	8.81
8	8.80
9	8.75
10	8.76

$$\frac{.42}{10} \times 60 = 2.52 \text{ OUR}$$

$$\frac{\text{OUR } 2.52 \times 1000}{\text{Dig. VSS } 12,000} = .08 \text{ SOUR}$$

$$\frac{.77 - .63}{.77 - (.77 \times .63)} = \frac{.14}{.77 - .48} = \frac{.14}{.29} = 48 \text{ 8 VSS Reduct}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 7.18.18.

LOCATION - DESCRIPTION
PARAMETER

cell 2
UNITS

DIG -aerobic digester TU

00010	TEMP-WATER-C	Degrees C	21.1
00011	TEMP-WATER-F	Degrees F	
00300	DISS-OXYGEN	MG/L	
00403	PH-LAB	S.U.	3.3
00530	RESIDUE-TOT NFLT	MG/L	
00535	RESIDUE-VOL NFLT	MG/L	
M90025	OXYGEN-UPTAKE	MG/L/HR	
M91029	LIME-CAOH	LB LS/D	
M91030	LIME-CAO	LB LS/D	
M91070	DAY OF WEEK	NUMBER	
SOUR	SPECIFIC UPTAKE	mgO2/hr/gm	
SPIN	CENTRIFUGE	%	

Good
to

Go

3

START D.O. 8.64

START Temp 21.1

8.64
8.44
-20

min	DO
1	8.64
2	8.63
3	8.59
4	8.56
5	8.50
6	8.46
7	8.52
8	8.51
9	8.45
10	8.44

$$\frac{20}{10} \times 60 = 1.2 \text{ OUR}$$

$$\frac{\text{OUR } 1.2 \times 1000}{\text{Dig. VSS } 11,300} = .10 \text{ SOUR}$$

$$\frac{.78 - .66}{.78 - (.78 \times .66)} = \frac{.12}{.78 - .51} = \frac{.12}{.27} = 44 \text{ \% VSS Reduction}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 6.15.18.

LOCATION - DESCRIPTION cell 1
PARAMETER UNITS

DIG -aerobic digester TU

00010	TEMP-WATER-C	Degrees C	_____
00011	TEMP-WATER-F	Degrees F.	_____
00300	DISS-OXYGEN	MG/L	_____
00403	PH-LAB	S.U.	2.0
00530	RESIDUE-TOT NFLT	MG/L	_____
00535	RESIDUE-VOL NFLT	MG/L	_____
M90025	OXYGEN-UPTAKE	MG/L/HR	_____
M91029	LIME-CAOH	LB LB/D	_____
M91030	LIME-CAO	LB LB/D	_____
M91070	DAY OF WEEK	NUMBER	_____
SOUR	SPECIFIC UPTAKE	mgO2/hr/gm	_____
SPIN	CENTRIFUGE	%	_____

Good
to
Go

START D.O. 8.41
START Temp 21.2°C

min	DO
1	8.35
2	8.26
3	8.33
4	8.32
5	8.27
6	8.24
7	8.21
8	8.18
9	8.16
10	8.12

$$\frac{.29}{10} \times 60 = 1.74 \text{ OUR}$$

$$\frac{\text{OUR } 1.74 \times 1000}{\text{Dig. VSS } 10,433} = \frac{.16}{1.74} \text{ SOUR}$$

$$\frac{.76 - .64}{.76 - (.76 \times .64)} = \frac{.12}{.76 - .48} = \frac{.12}{.28} = .43 \text{ 8 VSS Reduction}$$

1.5 SOUR OR LOWER
80% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 5.25.18

LOCATION - DESCRIPTION
PARAMETER

all #2
UNITS

DIG -aerobic digester TU

00010 TEMP-WATER-C	Degrees C	20.3 °C
00011 TEMP-WATER-F	Degrees F.	
00300 DISS-OXYGEN	MG/L	
00403 PH-LAB	S.U.	3.5
00530 RESIDUE-TOT NFLT	MG/L	
00535 RESIDUE-VOL NFLT	MG/L	
M90025 OXYGEN-UPTAKE	MG/L/HR	
M91029 LIME-CAOH	LB LB/D	
M91030 LIME-CAO	LB LB/D	
M91070 DAY OF WEEK	NUMBER	
SOUR SPECIFIC UPTAKE	mgO2/hr/gm	
SPIN CENTRIFUGE	%	

Good
to

Go

START D.O. 8.57
START Temp 20.3 °C

min	DO
1	8.61
2	8.60
3	8.58
4	8.55
5	8.50
6	8.48
7	8.48
8	8.44
9	8.38
10	8.34

$$\frac{27}{10} \times 60 = 1.62 \text{ OUR}$$

$$\frac{\text{OUR } 1.62 \times 1000}{\text{Dig. VSS } 11,100} = 1.4 \text{ SOUR}$$

$$\frac{.76 - .64}{.76 - (.76 \times .64)} = \frac{.12}{.76 - .48} = \frac{.12}{.28} = 43\% \text{ VSS Reduction}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 5-11-18.

LOCATION - DESCRIPTION *all 2*
PARAMETER UNITS

DIG -aerobic digester TU

00010	TEMP-WATER-C	Degrees C	<u>11.4°C</u>
00011	TEMP-WATER-F	Degrees F.	<u> </u>
00300	DISS-OXYGEN	MG/L	<u> </u>
00403	PH-LAB	S.U.	<u>3.3</u>
00530	RESIDUE-TOT NFLT	MG/L	<u> </u>
00535	RESIDUE-VOL NFLT	MG/L	<u> </u>
M90025	OXYGEN-UP TAKE	MG/L/HR	<u> </u>
M91029	LIME-CAOH	LB LS/D	<u> </u>
M91030	LIME-CAO	LB LS/D	<u> </u>
M91070	DAY OF WEEK	NUMBER	<u> </u>
SOUR	SPECIFIC UPTAKE	mgO2/hr/gm	<u> </u>
SPIN	CENTRIFUGE	%	<u> </u>

Good to

Go

START D.O. 10.37
START Temp 11.4°C

$$.37 + .09 = .46$$

min	DO
1	10.39
2	10.39
3	10.33
4	10.29
5	10.25
6	10.22
7	10.19
8	10.04
9	9.97
10	9.91

$$\frac{.46}{10} \times 60 = 2.76 \text{ OUR}$$

$$\frac{\text{OUR } 2.76 \times 1000}{\text{Dig. VSS } 12,400} = .22 \text{ SOUR}$$

$$\frac{.75 - .63}{.75 - (.75 \times .63)} = \frac{.12}{.75 - .47} = \frac{.12}{.28} = 43\% \text{ VSS Reduction}$$

1.5 SOUR OR LOWER
38% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 4-28-18

LOCATION - DESCRIPTION
PARAMETER

cell #1
UNITS

DIG -aerobic digester TU

00010	TEMP-WATER-C	Degrees C	18.6
00011	TEMP-WATER-F	Degrees F	
00300	DISS-OXYGEN	MG/L	
00403	PH-LAB	S.U.	
00530	RESIDUE-TOT NFLT	MG/L	
00535	RESIDUE-VOL NFLT	MG/L	
M90025	OXYGEN-UP TAKE	MG/L/HR	
M91029	LIME-CAOH	LB LS/D	
M91030	LIME-CAO	LB LS/D	
M91070	DAY OF WEEK	NUMBER	
SOUR	SPECIFIC UPTAKE	mgO2/hr/gm	
SPIN	CENTRIFUGE	%	

Good
to
GO

START D.O. 10.22
START Temp 18.6 °C

min	DO
1	10.23
2	10.22
3	10.21
4	10.15
5	10.15
6	10.12
7	10.09
8	10.07
9	10.02
10	9.97

$$\frac{.25}{10} \times 60 = 1.5 \text{ OUR}$$

$$\frac{\text{OUR } 1.5 \times 1000}{\text{DIE. VSS } 20,433} = .07 \text{ SOUR}$$

$$\frac{.75 - .62}{.75 - (.75 \times .62)} = \frac{.13}{.75 - .465} = \frac{.13}{.285} = 45 \text{ \% VSS Reduction}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 2-23-18

LOCATION - DESCRIPTION *cell 2*
PARAMETER UNITS

DIG -aerobic digester TU
00010 TEMP-WATER-C Degrees C 8.4
00011 TEMP-WATER-F Degrees F
00300 DISS-OXYGEN MG/L
00403 PH-LAB S.U. 3.7
00530 RESIDUE-TOT NFLT MG/L
00535 RESIDUE-VOL NFLT MG/L
M90025 OXYGEN-UP TAKE MG/L/HR
M91029 LIME-CAOH LB LB/D
M91030 LIME-CAO LB LB/D
M91070 DAY OF WEEK NUMBER
SOUR SPECIFIC UPTAKE mgO2/hr/gm
SPIN CENTRIFUGE %

START D.O. 11.90
START Temp 10.4°C

min	DO
1	11.65
2	11.81
3	11.79
4	11.79
5	11.77
6	11.75
7	11.74
8	11.72
9	11.70
10	11.67

$$\frac{.23}{10} \times 60 = 1.38 \text{ OUR}$$

$$\frac{\text{OUR } 1.38 \times 1000}{\text{Dig. VSS } 10,666} = .12 \text{ SOUR}$$

$$\frac{.77 - .63}{.77 - (.77 \times .63)} = \frac{.14}{.27} = \frac{.14}{.29} = .48 \text{ 8 VSS Reduction}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS

Toledo WWTP

PM DATA ENTRY WORKSHEET

DATE 2-1-18

LOCATION - DESCRIPTION cell 2
PARAMETER UNITS

DIG -aerobic digester TU

00010	TEMP-WATER-C	Degrees C	<u>11.8</u>
00011	TEMP-WATER-F	Degrees F	<u>53.2</u>
00300	DISS-OXYGEN	MG/L	<u>11.81</u>
00403	PH-LAB	S.U.	<u>7.2</u>
00530	RESIDUE-TOT NFLT	MG/L	<u>11.75</u>
00535	RESIDUE-VOL NFLT	MG/L	<u>11.76</u>
M90025	OXYGEN-UP TAKE	MG/L/HR	<u>11.75</u>
M91029	LIME-CAOH	LB LS/D	<u>11.72</u>
M91030	LIME-CAO	LB LS/D	<u>11.68</u>
M91070	DAY OF WEEK	NUMBER	<u>11.67</u>
SOUR	SPECIFIC UPTAKE	mgO2/hr/gm	<u>11.66</u>
SPIN	CENTRIFUGE	%	<u>11.65</u>

START D.O. 11.81START Temp 13.4 °C

min	DO
1	11.81
2	11.75
3	11.76
4	11.75
5	11.72
6	11.68
7	11.67
8	11.66
9	11.65
10	11.61

$$\frac{.20}{10} \times 60 = 1.2 \text{ OUR}$$

$$\frac{\text{OUR}}{\text{DIG. VSS}} \times 1000 = \text{SOUR}$$

$$\frac{.66 - .63}{.66 - (.66 \times .63)} = \frac{.03}{.66 - .41} = \frac{.03}{.25} = .12 \text{ 8 VSS Reduction}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS

PM DATA ENTRY WORKS

DATE 12-28-17

LOCATION - DESCRIPTION
PARAMETER

cell #2
UNITS

DIG -aerobic digester TU

00010 TEMP-WATER-C	Degrees C	_____
00011 TEMP-WATER-F	Degrees F.	_____
00300 DISS-OXYGEN	MG/L	_____
00403 PH-LAB	S.U.	3.7
00530 RESIDUE-TOT NFLT	MG/L	_____
00535 RESIDUE-VOL NFLT	MG/L	_____
M90025 OXYGEN-UP TAKE	MG/L/HR	_____
M91029 LIME-CAOH	LB LB/D	_____
M91030 LIME-CAO	LB LB/D	_____
M91070 DAY OF WEEK	NUMBER	_____
SOUR SPECIFIC UPTAKE	mgO2/hr/gm	_____
SPIN CENTRIFUGE	%	_____

Good
to
Go

START D.O. 11.02
START Temp 17.2°C

11.16
10.75
0.41

min	DO
1	11.14
2	11.16
3	11.10
4	11.04
5	11.05
6	11.07
7	11.05
8	11.00
9	10.98
10	10.90
11	10.81
12	10.75

$$\frac{0.41}{10} \times 60 = 2.46 \text{ OUR}$$

$$\frac{\text{OUR } 2.46 \times 1000}{\text{Dig. VSS } 11,666} = 0.21 \text{ SOUR}$$

$$\frac{0.75 - 0.63}{0.75 - (0.75 \times 0.63)} = \frac{0.12}{0.75 - 0.47} = \frac{0.12}{0.28} = 42.8 \text{ \% VSS Reduction}$$

1.5 SOUR OR LOWER
30% VSS Reduction OR MORE TO PASS



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-002926
Report Date: 05/31/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: 1 Sludge		Collected: 5/3/18 10:15 AM	By: Client	Matrix: Other	
Parameter	Method	As Received	Dry Weight	Units	
Ammonia Nitrogen	EPA350.1	0.0122	0.328	%	
Arsenic	EPA6020	0.247	6.64	mg/kg	
Cadmium	EPA6020	0.0694	1.87	mg/kg	
Chromium	EPA6020	1.16	31.2	mg/kg	
Copper	EPA6020	9.37	252	mg/kg	
Iron	EPA6010B	1510	40600	mg/kg	
Lead	EPA6020	1.22	32.8	mg/kg	
Mercury	EPA7471B	0.0246	0.661	mg/kg	
Molybdenum	EPA6020	0.193	5.19	mg/kg	
Nickel	EPA6010B	0.701	18.8	mg/kg	
Nitrate-Nitrite	EPA9056	0.00157	0.0422	%	
pH	EPA 9045D	6.54		SU	
Phosphorus	EPA6020	0.111	2.98	%	
Potassium	EPA6010B	77.6	2090	mg/kg	
Selenium	EPA6020	0.198	5.32	mg/kg	
Silver	EPA6020	< 0.0978	< 2.63	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.173	4.65	%	
Total Solids	SM2540B	3.72		%	
Total Volatile Solids	SM2540E	2.16*	58.1**	%	
Zinc	EPA6020	21.2	570	mg/kg	

Notes:

* Reported as % of total sample.

** Reported as % of Total Solids.

SM means Standard Methods for the Examination of Water and Wastewater, 1995, 19th Edition.

The less than "<" symbol means none detected at or above the indicated value and represents the reporting limit for the method.

This analysis is not covered under ORELAP scope of accreditation.

Abbreviations

Units of Measure

mg/kg = Milligram per kilogram

% = Percentage of sample

SU = Standard Unit

Order 18-002926

Page 2 of 4

Columbia Food Laboratories
Pixis Labs
Member of Tentamus Group
12423 NE Whitaker Way
Portland, OR 97230

info@columbiafoodlab.com
www.columbiafoodlab.com
customerservice@pixislabs.com
www.pixislabs.com
www.tentamus.com

Company registered
in the United States of America
Tax ID: 93-1227941



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (1) Jimmy 1' 4.7

Collected: 9/6/18 03:50 PM

By: Client

Matrix: Other

Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units
Ammonia Nitrogen	EPA350.1	0.000923	0.000491	0.00116	0.0006	%
Arsenic	EPA6020	3.59	0.188	4.50	0.235	mg/kg
Cadmium	EPA6020	0.104	0.0750	0.130	0.0940	mg/kg
Chromium	EPA6020	80.9	3.75	101	4.70	mg/kg
Copper	EPA6020	49.5	0.375	62.0	0.470	mg/kg
Lead	EPA6020	6.52	0.0750	8.17	0.0940	mg/kg
Mercury	EPA7471B	0.0688	0.0176	0.0862	0.0220	mg/kg
Molybdenum	EPA6020	0.414	0.375	0.519	0.470	mg/kg
Nickel	EPA6010B	65.7	1.88	82.3	2.35	mg/kg
Nitrate-Nitrite	EPA9056	< LOQ	0.000241	< LOQ	0.0003	%
Phosphorus	EPA6010B	0.136	0.0188	0.170	0.0235	%
Potassium	EPA6010B	853	188	1070	235	mg/kg
Selenium	EPA6020	1.86	0.375	2.33	0.470	mg/kg
Silver	EPA6020	< LOQ	0.188	< LOQ	0.235	mg/kg
Total Kjeldahl Nitrogen	EPA351.2	0.449	0.0246	0.563	0.0309	%
Total Solids	SM2540B	79.8	0.0100			%
Zinc	EPA6020	72.3	0.375	90.6	0.470	mg/kg

Sample Results

Sample: (3) Jimmy 1' 11.7

Collected: 9/6/18 03:45 PM

By: Client

Matrix: Other

Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units
Ammonia Nitrogen	EPA350.1	0.00267	0.000243	0.00360	0.0003	%
Arsenic	EPA6020	6.35	0.170	8.57	0.229	mg/kg
Cadmium	EPA6020	< LOQ	0.0680	< LOQ	0.0918	mg/kg
Chromium	EPA6020	23.1	0.340	31.2	0.459	mg/kg
Copper	EPA6020	17.2	0.340	23.2	0.459	mg/kg
Lead	EPA6020	10.8	0.0680	14.6	0.0918	mg/kg
Mercury	EPA7471B	0.0672	0.0189	0.0907	0.0255	mg/kg
Molybdenum	EPA6020	0.370	0.340	0.499	0.459	mg/kg
Nickel	EPA6010B	22.9	1.70	30.9	2.29	mg/kg
Nitrate-Nitrite	EPA9056	< LOQ	0.000243	< LOQ	0.0003	%

Order 18-007635

Page 2 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (3) Jimmy 1' 11.7		Collected: 9/6/18 03:45 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Phosphorus	EPA6010B	0.195	0.0170	0.263	0.0229	%	
Potassium	EPA6010B	1410	170	1900	229	mg/kg	
Selenium	EPA6020	1.27	0.340	1.71	0.459	mg/kg	
Silver	EPA6020	< LOQ	0.170	< LOQ	0.229	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.346	0.0248	0.467	0.0335	%	
Total Solids	SM2540B	74.1	0.0100			%	
Zinc	EPA6020	59.5	0.340	80.3	0.459	mg/kg	

Sample Results

Sample: (5) Howard 1' 18		Collected: 9/6/18 04:05 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000673	0.000248	0.000889	0.0003	%	
Arsenic	EPA6020	6.69	0.191	8.84	0.253	mg/kg	
Cadmium	EPA6020	< LOQ	0.0765	< LOQ	0.101	mg/kg	
Chromium	EPA6020	26.0	0.382	34.3	0.505	mg/kg	
Copper	EPA6020	17.4	0.382	23.0	0.505	mg/kg	
Lead	EPA6020	11.3	0.0765	14.9	0.101	mg/kg	
Mercury	EPA7471B	0.0574	0.0176	0.0758	0.0233	mg/kg	
Molybdenum	EPA6020	< LOQ	0.382	< LOQ	0.505	mg/kg	
Nickel	EPA6010B	23.6	1.91	31.2	2.53	mg/kg	
Nitrate-Nitrite	EPA9056	0.000342	0.000241	0.000452	0.0003	%	
Phosphorus	EPA6010B	0.137	0.0191	0.181	0.0253	%	
Potassium	EPA6010B	1460	191	1930	253	mg/kg	
Selenium	EPA6020	1.19	0.382	1.57	0.505	mg/kg	
Silver	EPA6020	< LOQ	0.191	< LOQ	0.253	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.136	0.0228	0.180	0.0301	%	
Total Solids	SM2540B	75.7	0.0100			%	
Zinc	EPA6020	59.8	0.382	79.0	0.505	mg/kg	

Order 18-007635

Page 3 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (7) Hughes 1' 7.1		Collected: 9/6/18 03:30 PM		By: Client		Matrix: Other	
Parameter	Method	As Received LOQ		Dry Weight LOQ		Units	
Ammonia Nitrogen	EPA350.1	0.000911	0.000248	0.00128	0.0003	%	
Arsenic	EPA6020	4.06	0.193	5.69	0.270	mg/kg	
Cadmium	EPA6020	0.122	0.0771	0.171	0.108	mg/kg	
Chromium	EPA6020	67.6	3.86	94.7	5.41	mg/kg	
Copper	EPA6020	39.1	0.386	54.8	0.541	mg/kg	
Lead	EPA6020	7.00	0.0771	9.80	0.108	mg/kg	
Mercury	EPA7471B	0.0729	0.0182	0.102	0.0254	mg/kg	
Molybdenum	EPA6020	0.442	0.386	0.619	0.541	mg/kg	
Nickel	EPA6010B	48.9	1.93	68.5	2.70	mg/kg	
Nitrate-Nitrite	EPA9056	0.000295	0.000248	0.000413	0.0003	%	
Phosphorus	EPA6010B	0.136	0.0193	0.190	0.0270	%	
Potassium	EPA6010B	1190	193	1670	270	mg/kg	
Selenium	EPA6020	2.14	0.386	3.00	0.541	mg/kg	
Silver	EPA6020	< LOQ	0.193	< LOQ	0.270	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.283	0.0248	0.396	0.0347	%	
Total Solids	SM2540B	71.4	0.0100			%	
Zinc	EPA6020	71.4	0.386	100	0.541	mg/kg	

Sample Results

Sample: (9) Kosy 1' 6.0		Collected: 9/6/18 02:20 PM		By: Client		Matrix: Other	
Parameter	Method	As Received LOQ		Dry Weight LOQ		Units	
Ammonia Nitrogen	EPA350.1	0.000834	0.000238	0.00115	0.0003	%	
Arsenic	EPA6020	2.81	0.192	3.89	0.266	mg/kg	
Cadmium	EPA6020	0.241	0.0768	0.333	0.106	mg/kg	
Chromium	EPA6020	101	3.84	140	5.31	mg/kg	
Copper	EPA6020	42.8	0.384	59.2	0.531	mg/kg	
Lead	EPA6020	5.88	0.0768	8.13	0.106	mg/kg	
Mercury	EPA7471B	0.0801	0.0192	0.111	0.0265	mg/kg	
Molybdenum	EPA6020	< LOQ	0.384	< LOQ	0.531	mg/kg	
Nickel	EPA6010B	85.9	1.92	119	2.66	mg/kg	
Nitrate-Nitrite	EPA9056	0.000287	0.000247	0.000397	0.0003	%	
Phosphorus	EPA6010B	0.192	0.0192	0.266	0.0266	%	

Order 18-007635

Page 4 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (9) Kosy 1' 6.0		Collected: 9/6/18 02:20 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Potassium	EPA6010B	1060	192	1470	266	mg/kg	
Selenium	EPA6020	1.56	0.384	2.16	0.531	mg/kg	
Silver	EPA6020	< LOQ	0.192	< LOQ	0.266	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.482	0.0246	0.667	0.0340	%	
Total Solids	SM2540B	72.3	0.0100			%	
Zinc	EPA6020	87.4	0.384	121	0.531	mg/kg	

Sample Results

Sample: (11) Kosy 1' 11.5		Collected: 9/6/18 02:25 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.00101	0.000245	0.00121	0.0003	%	
Arsenic	EPA6020	3.72	0.188	4.47	0.226	mg/kg	
Cadmium	EPA6020	0.108	0.0752	0.130	0.0903	mg/kg	
Chromium	EPA6020	32.1	0.376	38.6	0.452	mg/kg	
Copper	EPA6020	26.7	0.376	32.1	0.452	mg/kg	
Lead	EPA6020	6.00	0.0752	7.21	0.0903	mg/kg	
Mercury	EPA7471B	0.0621	0.0170	0.0746	0.0204	mg/kg	
Molybdenum	EPA6020	0.400	0.376	0.481	0.452	mg/kg	
Nickel	EPA6010B	35.2	1.88	42.3	2.26	mg/kg	
Nitrate-Nitrite	EPA9056	< LOQ	0.000241	< LOQ	0.0003	%	
Phosphorus	EPA6010B	0.171	0.0188	0.206	0.0226	%	
Potassium	EPA6010B	1160	188	1390	226	mg/kg	
Selenium	EPA6020	1.61	0.376	1.94	0.452	mg/kg	
Silver	EPA6020	< LOQ	0.188	< LOQ	0.226	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.626	0.0249	0.752	0.0299	%	
Total Solids	SM2540B	83.2	0.0100			%	
Zinc	EPA6020	56.4	0.376	67.8	0.452	mg/kg	

Sample Results

Sample: (13) Kosy 1'		Collected: 9/6/18 02:35 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000492	0.000247	0.000633	0.0003	%	
Arsenic	EPA6020	3.60	0.200	4.63	0.257	mg/kg	

Order 18-007635

Page 5 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (13) Kosy 1'	Collected: 9/6/18 02:35 PM	By: Client		Matrix: Other		
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units
Cadmium	EPA6020	0.116	0.0798	0.149	0.103	mg/kg
Chromium	EPA6020	85.5	3.99	110	5.13	mg/kg
Copper	EPA6020	69.7	3.99	89.7	5.13	mg/kg
Mercury	EPA7471B	0.0823	0.0194	0.106	0.0250	mg/kg
Molybdenum	EPA6020	0.421	0.399	0.542	0.513	mg/kg
Nickel	EPA6010B	70.4	2.00	90.6	2.57	mg/kg
Nitrate-Nitrite	EPA9056	< LOQ	0.000247	< LOQ	0.0003	%
Phosphorus	EPA6010B	0.133	0.0200	0.171	0.0257	%
Potassium	EPA6010B	845	200	1090	257	mg/kg
Selenium	EPA6020	1.90	0.399	2.45	0.513	mg/kg
Silver	EPA6020	< LOQ	0.200	< LOQ	0.257	mg/kg
Total Kjeldahl Nitrogen	EPA351.2	0.267	0.0241	0.344	0.0311	%
Total Solids	SM2540B	77.7	0.0100			%
Zinc	EPA6020	107	3.99	138	5.13	mg/kg

Sample Results

Sample: (2) Jimmy 2' 4.7		Collected: 9/6/18 03:50 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000554	0.000249	0.000768	0.0003	%	
Arsenic	EPA6020	6.71	0.199	9.31	0.276	mg/kg	
Cadmium	EPA6020	< LOQ	0.0797	< LOQ	0.111	mg/kg	
Chromium	EPA6020	27.6	0.398	38.3	0.553	mg/kg	
Copper	EPA6020	18.3	0.398	25.4	0.553	mg/kg	
Lead	EPA6020	11.0	0.0797	15.3	0.111	mg/kg	
Mercury	EPA7471B	0.0777	0.0176	0.108	0.0245	mg/kg	
Molybdenum	EPA6020	0.423	0.398	0.587	0.553	mg/kg	
Nickel	EPA6010B	24.7	1.99	34.3	2.76	mg/kg	
Nitrate-Nitrite	EPA9056	0.000248	0.000241	0.000344	0.0003	%	
Phosphorus	EPA6010B	0.175	0.0199	0.243	0.0276	%	
Potassium	EPA6010B	1540	199	2140	276	mg/kg	
Selenium	EPA6020	1.23	0.398	1.71	0.553	mg/kg	
Silver	EPA6020	< LOQ	0.199	< LOQ	0.276	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.291	0.0236	0.404	0.0328	%	

Order 18-007635

Page 6 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (2) Jimmy 2' 4.7		Collected: 9/6/18 03:50 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Total Solids	SM2540B	72.1	0.0100			%	
Zinc	EPA6020	64.5	0.398	89.5	0.553	mg/kg	

Sample Results

Sample: (4) Jimmy 2' 11.7		Collected: 9/6/18 03:45 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000808	0.000246	0.00110	0.0003	%	
Arsenic	EPA6020	4.15	0.193	5.64	0.262	mg/kg	
Cadmium	EPA6020	0.158	0.0772	0.215	0.105	mg/kg	
Chromium	EPA6020	33.1	0.386	45.0	0.524	mg/kg	
Copper	EPA6020	29.2	0.386	39.7	0.524	mg/kg	
Lead	EPA6020	7.28	0.0772	9.89	0.105	mg/kg	
Mercury	EPA7471B	0.0772	0.0198	0.105	0.0269	mg/kg	
Molybdenum	EPA6020	0.485	0.386	0.659	0.524	mg/kg	
Nickel	EPA6010B	29.9	1.93	40.6	2.62	mg/kg	
Nitrate-Nitrite	EPA9056	0.000339	0.000240	0.000461	0.0003	%	
Phosphorus	EPA6010B	0.135	0.0193	0.183	0.0262	%	
Potassium	EPA6010B	974	193	1320	262	mg/kg	
Selenium	EPA6020	1.84	0.386	2.50	0.524	mg/kg	
Silver	EPA6020	0.535	0.193	0.727	0.262	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.577	0.0245	0.784	0.0332	%	
Total Solids	SM2540B	73.6	0.0100			%	
Zinc	EPA6020	58.8	0.386	79.9	0.524	mg/kg	

Sample Results

Sample: (6) Howard 2' 18		Collected: 9/6/18 04:05 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000561	0.000250	0.000785	0.0003	%	
Arsenic	EPA6020	4.22	0.191	5.90	0.268	mg/kg	
Cadmium	EPA6020	0.119	0.0766	0.166	0.107	mg/kg	
Chromium	EPA6020	63.2	3.83	88.4	5.35	mg/kg	
Copper	EPA6020	50.8	3.83	71.0	5.35	mg/kg	
Lead	EPA6020	6.59	0.0766	9.22	0.107	mg/kg	

Order 18-007635

Page 7 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (6) Howard 2' 18		Collected: 9/6/18 04:05 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Mercury	EPA7471B	0.0650	0.0188	0.0909	0.0263	mg/kg	
Molybdenum	EPA6020	0.432	0.383	0.604	0.535	mg/kg	
Nickel	EPA6010B	47.7	1.91	66.7	2.68	mg/kg	
Nitrate-Nitrite	EPA9056	< LOQ	0.000236	< LOQ	0.0003	%	
Phosphorus	EPA6010B	0.124	0.0191	0.173	0.0268	%	
Potassium	EPA6010B	1150	191	1610	268	mg/kg	
Selenium	EPA6020	1.98	0.383	2.77	0.535	mg/kg	
Silver	EPA6020	< LOQ	0.191	< LOQ	0.268	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.293	0.0236	0.410	0.0330	%	
Total Solids	SM2540B	71.5	0.0100			%	
Zinc	EPA6020	95.0	3.83	133	5.35	mg/kg	

Sample Results

Sample: (8) Hughes 2' 7.1		Collected: 9/6/18 03:30 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000571	0.000248	0.000797	0.0003	%	
Arsenic	EPA6020	2.91	0.197	4.06	0.275	mg/kg	
Cadmium	EPA6020	0.203	0.0787	0.284	0.110	mg/kg	
Chromium	EPA6020	103	3.93	144	5.49	mg/kg	
Copper	EPA6020	55.9	3.93	78.1	5.49	mg/kg	
Lead	EPA6020	5.54	0.0787	7.74	0.110	mg/kg	
Mercury	EPA7471B	0.0618	0.0181	0.0863	0.0252	mg/kg	
Molybdenum	EPA6020	< LOQ	0.393	< LOQ	0.549	mg/kg	
Nickel	EPA6010B	84.8	1.97	118	2.75	mg/kg	
Nitrate-Nitrite	EPA9056	0.000344	0.000250	0.000480	0.0003	%	
Phosphorus	EPA6010B	0.162	0.0197	0.226	0.0275	%	
Potassium	EPA6010B	975	197	1360	275	mg/kg	
Selenium	EPA6020	1.69	0.393	2.36	0.549	mg/kg	
Silver	EPA6020	< LOQ	0.197	< LOQ	0.275	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.455	0.0250	0.635	0.0349	%	
Total Solids	SM2540B	71.6	0.0100			%	
Zinc	EPA6020	109	3.93	152	5.49	mg/kg	

Order 18-007635

Page 8 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (10) Kosy 2' 6.0		Collected: 9/6/18 02:20 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000618	0.000248	0.000777	0.0003	%	
Arsenic	EPA6020	3.89	0.190	4.89	0.239	mg/kg	
Cadmium	EPA6020	0.0921	0.0761	0.116	0.0958	mg/kg	
Chromium	EPA6020	46.6	3.80	58.6	4.79	mg/kg	
Copper	EPA6020	36.4	3.80	45.8	4.79	mg/kg	
Lead	EPA6020	5.87	0.0761	7.38	0.0958	mg/kg	
Mercury	EPA7471B	0.0544	0.0187	0.0684	0.0235	mg/kg	
Molybdenum	EPA6020	0.405	0.380	0.509	0.479	mg/kg	
Nickel	EPA6010B	35.7	1.90	44.9	2.39	mg/kg	
Nitrate-Nitrite	EPA9056	0.000290	0.000243	0.000365	0.0003	%	
Phosphorus	EPA6010B	0.147	0.0190	0.185	0.0239	%	
Potassium	EPA6010B	1220	190	1530	239	mg/kg	
Selenium	EPA6020	1.73	0.380	2.18	0.479	mg/kg	
Silver	EPA6020	< LOQ	0.190	< LOQ	0.239	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.477	0.0234	0.600	0.0294	%	
Total Solids	SM2540B	79.5	0.0100			%	
Zinc	EPA6020	80.1	3.80	101	4.79	mg/kg	

Sample Results

Sample: (12) Kosy 2' 11.5		Collected: 9/6/18 02:25 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.00311	0.000249	0.00428	0.0003	%	
Arsenic	EPA6020	4.20	0.191	5.78	0.263	mg/kg	
Cadmium	EPA6020	0.139	0.0764	0.191	0.105	mg/kg	
Chromium	EPA6020	50.6	3.82	69.6	5.25	mg/kg	
Copper	EPA6020	41.4	3.82	56.9	5.25	mg/kg	
Lead	EPA6020	7.23	0.0764	9.94	0.105	mg/kg	
Mercury	EPA7471B	0.109	0.0198	0.150	0.0272	mg/kg	
Molybdenum	EPA6020	0.469	0.382	0.645	0.525	mg/kg	
Nickel	EPA6010B	32.6	1.91	44.8	2.63	mg/kg	

Order 18-007635

Page 9 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (12) Kosy 2' 11.5		Collected: 9/6/18 02:25 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Nitrate-Nitrite	EPA9056	0.000598	0.000237	0.000823	0.0003	%	
Phosphorus	EPA6010B	0.147	0.0191	0.202	0.0263	%	
Potassium	EPA6010B	1190	191	1640	263	mg/kg	
Selenium	EPA6020	1.70	0.382	2.34	0.525	mg/kg	
Silver	EPA6020	0.430	0.191	0.591	0.263	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.601	0.0245	0.827	0.0337	%	
Total Solids	SM2540B	72.7	0.0100			%	
Zinc	EPA6020	87.6	3.82	120	5.25	mg/kg	

Sample Results

Sample: (14) Kosy 2'		Collected: 9/6/18 02:35 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000663	0.000243	0.000833	0.0003	%	
Arsenic	EPA6020	9.84	0.197	12.4	0.247	mg/kg	
Cadmium	EPA6020	0.136	0.0786	0.171	0.0988	mg/kg	
Chromium	EPA6020	40.3	3.93	50.6	4.94	mg/kg	
Copper	EPA6020	36.3	3.93	45.6	4.94	mg/kg	
Lead	EPA6020	10.6	0.0786	13.3	0.0988	mg/kg	
Mercury	EPA7471B	0.0738	0.0193	0.0927	0.0242	mg/kg	
Molybdenum	EPA6020	0.411	0.393	0.516	0.494	mg/kg	
Nickel	EPA6010B	17.5	1.97	22.0	2.47	mg/kg	
Nitrate-Nitrite	EPA9056	< LOQ	0.000248	< LOQ	0.0003	%	
Phosphorus	EPA6010B	0.109	0.0197	0.137	0.0247	%	
Potassium	EPA6010B	1690	197	2120	247	mg/kg	
Selenium	EPA6020	1.14	0.393	1.43	0.494	mg/kg	
Silver	EPA6020	< LOQ	0.197	< LOQ	0.247	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.250	0.0248	0.314	0.0311	%	
Total Solids	SM2540B	79.6	0.0100			%	
Zinc	EPA6020	116	3.93	146	4.94	mg/kg	

Order 18-007635

Page 10 of 16

Columbia Food Laboratories
Pixis Labs
Member of Tentamus Group
12423 NE Whitaker Way
Portland, OR 97230

info@columbiafoodlab.com
www.columbiafoodlab.com
customerservice@pixislabs.com
www.pixislabs.com
www.tentamus.com

Company registered
in the United States of America
Tax ID: 93-1227941



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (15) May 1' 5.0		Collected: 9/6/18 03:05 PM		By: Client		Matrix: Other	
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units	
Ammonia Nitrogen	EPA350.1	0.000476	0.000247	0.000609	0.0003	%	
Arsenic	EPA6020	8.54	0.200	10.9	0.255	mg/kg	
Cadmium	EPA6020	0.0918	0.0799	0.118	0.102	mg/kg	
Chromium	EPA6020	39.0	3.99	49.9	5.11	mg/kg	
Copper	EPA6020	37.4	3.99	47.9	5.11	mg/kg	
Lead	EPA6020	9.73	0.0799	12.5	0.102	mg/kg	
Mercury	EPA7471B	0.0786	0.0192	0.101	0.0246	mg/kg	
Molybdenum	EPA6020	< LOQ	0.399	< LOQ	0.511	mg/kg	
Nickel	EPA6010B	19.1	2.00	24.5	2.55	mg/kg	
Nitrate-Nitrite	EPA9056	< LOQ	0.000246	< LOQ	0.0003	%	
Phosphorus	EPA6010B	0.0932	0.0200	0.119	0.0255	%	
Potassium	EPA6010B	1650	200	2110	255	mg/kg	
Selenium	EPA6020	1.16	0.399	1.49	0.511	mg/kg	
Silver	EPA6020	< LOQ	0.200	< LOQ	0.255	mg/kg	
Total Kjeldahl Nitrogen	EPA351.2	0.171	0.0243	0.219	0.0311	%	
Total Solids	SM2540B	78.1	0.0100			%	
Zinc	EPA6020	99.0	3.99	127	5.11	mg/kg	

Sample Results

Sample: (16) May 2' 5.0	Collected: 9/6/18 03:05 PM	By: Client		Matrix: Other		
Parameter	Method	As Received	LOQ	Dry Weight	LOQ	Units
Ammonia Nitrogen	EPA350.1	0.00108	0.000248	0.00134	0.0003	%
Arsenic	EPA6020	6.99	0.186	8.65	0.230	mg/kg
Cadmium	EPA6020	< LOQ	0.0744	< LOQ	0.0920	mg/kg
Chromium	EPA6020	32.5	3.72	40.2	4.60	mg/kg
Copper	EPA6020	24.5	3.72	30.3	4.60	mg/kg
Lead	EPA6020	11.4	0.0744	14.1	0.0920	mg/kg
Mercury	EPA7471B	0.0711	0.0198	0.0880	0.0245	mg/kg
Molybdenum	EPA6020	< LOQ	0.372	< LOQ	0.460	mg/kg
Nickel	EPA6010B	22.6	1.86	28.0	2.30	mg/kg
Nitrate-Nitrite	EPA9056	0.000362	0.000235	0.000448	0.0003	%
Phosphorus	EPA6010B	0.181	0.0186	0.224	0.0230	%
Potassium	EPA6010B	1250	186	1550	230	mg/kg

Order 18-007635

Page 11 of 16



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 18-007635
Report Date: 10/03/2018
Purchase Order:
Project Name:
Project No:



Sample Results

Sample: (16) May 2' 5.0	Collected: 9/6/18 03:05 PM	By: Client	Matrix: Other			
Silver	EPA6020	< LOQ	0.186	< LOQ	0.230	mg/kg
Total Kjeldahl Nitrogen	EPA351.2	0.426	0.0244	0.527	0.0302	%
Total Solids	SM2540B	80.8	0.0100			%
Zinc	EPA6020	85.0	3.72	105	4.60	mg/kg

Notes:

* Reported as % of total sample.

** Reported as % of Total Solids.

SM means Standard Methods for the Examination of Water and Wastewater, 1995, 19th Edition.

This analysis is not covered under ORELAP scope of accreditation.

Abbreviations

LOQ Limit of Quantification

Units of Measure

mg/kg = Milligram per kilogram

% = Percentage of sample