

John Huntington
H2O & S Inc.
7757 SE 92nd
Portland, OR 97266

Paul Kennedy
DEQ Western Region
165 East 7th Avenue, Suite 100
Eugene, Oregon 97401

RE: Annual Biosolids Report 2018

Dear Mr. Kennedy-

Please find enclosed a copy of the 2018 Annual Biosolids Report for the H2O & S WWTP.

We contracted with Zwald Transport of Tillamook to do our annual biosolids hauling in 2018. On August 10, 2018, we sent four loads of 5,500 gallons each to the field in Logsdan, Oregon we call Wyscaver #3. We applied the 22,000 gallons onto approximately 1.74 acres.

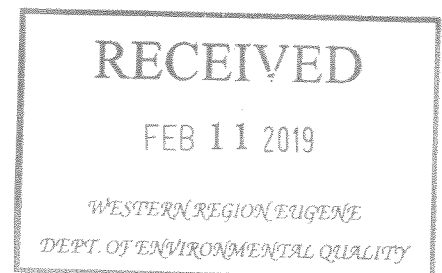
The total municipal flow (we only process municipal flow) through the plant for the year 2018 was 13,068,000 gallons or 13.07 MGD. This was calculated from the DMRs for 2018. As was said above, 22,000 gallons of treated sludge were applied to the Wyscaver property. The concentration of this material was at 1.7 % solids. This took four truck loads (each load being 5500 gallons). The total amount of Dry Solids applied to the property was: $0.022 \text{ MGD} \times 17,000 \text{ mg/L} \times 8.34 = 3,119 \text{ pounds}$ or 1.56 tons. As you know, we use alkaline stabilization both for Pathogen Reduction and Vector Attraction Reduction of our Class B Biosolids (addition of sufficient alkali to raise the pH of the biosolids to at least 12 at 25 C and maintain a pH of ≥ 12 for 2 hours and a pH of ≥ 11.5 for 22 more hours).

The total area of land the biosolids were applied to was 120' X 630'. This is equivalent to 75,600' or 1.74 acre (0.704 hectare).

If you have any questions about this matter, please contact me at 503-667-6735 or 503-777-2909.

Sincerely,

John Huntington
Treatment Plant Supervisor
H2O & S Inc.





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.: 41740
DEQ Permit No.: 101269 EPA Permit No.: OR002635-2

C. FACILITY INFORMATION

1. Legal name of facility: H2O & S WWTP

Physical address

2. Street Address: Inn at Otter Crest, Otter Crest Loop 1 Mile West of Hwy 101

City: Otter Rock

State: Oregon

Zip code: 97369

Mailing address ☐ Same as physical address.

3. Mailing Address: 7757 SE 92nd Ave.

City: Portland

State: Oregon

Zip code: 97266

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: John P. Huntington Title: Treatment Plant Manager
Email Address: hasenheld@yahoo.com Telephone: 503-777-2909
Mailing Address: 7757 SE 92nd Ave.
City: Portland State: Oregon Zip code: 97266

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.					
1.	Name	Type	Quantity	Units (choose one)	% solids
		☐ 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)			
1.	Thickening technology	Stabilization Technology	Dewatering technology
	☐ Gravity ☐ DAF ☐ Centrifugation ☐ Other:	☒ Aerobic digestion ☐ Anaerobic digestion ☒ Lime stabilization ☐ ATAD ☐ Composting ☐ Thermal ☐ Lagoon ☐ Other:	☐ Belt press ☐ Plate and frame press ☐ Screw press ☐ Centrifuge ☐ Vacuum filter ☐ Drying beds ☐ Heat drying ☐ Other:

$$\text{Dry tons} = \text{wet tons} \times \% \text{solids}$$

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

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					
1.	Disposition of wastewater solids	Quantity	(choose one)	%	solids
	☒ Treated and land applied, sold, or given-away as biosolids or biosolids-derived products	Gallons 22,000	Wet tons 70.79	Dry Tons 1.56	1.7
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

* 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:

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

3. ☐ 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

Treatment Plant Manager

02/12/19

Title

Date

Print Name: John P. Huntington



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		1.56
Total biosolids production	0	1.56
Please indicate how finished biosolids were managed (i.e., land applied, sold, stored, or other).		
	Class A	Class B
2. Land applied in bulk to agricultural land		1.56
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)		
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	1.56

K. BIOSOLIDS SAMPLING

Select your facility's minimum regulatory monitoring frequency (select only one box):							
1.	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.							
2.	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	06/27/18	06/27/18
	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		
	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		
	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	18.2	1.0	183	12	0.00732	3.4	16.0	29.7	687
Click Arrow									
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 ☒

Sample type	Average Nutrient Concentrations							
	TKN (mg/kg)	NO ₃ -N (mg/kg)	NH ₄ -N (mg/kg)	P (mg/kg)	K (mg/kg)	pH (S.U.)	Total solids (%)	F. coli MPN ☒ CFU ☐
1. - Annual								
- Quarterly								
- 60 days								
- Monthly								
Annual	5.3	0.14	0.31	2.0	0.39	6.7	1.7	5300
Click Arrow								
Click Arrow								
Click Arrow								
Click Arrow								
Click Arrow								
Click Arrow								
Click Arrow								
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.

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

 Treatment Plant Manager 02/12/19
Signature Title Date

Print Name: John P. Huntington



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.	3	Wyscaver	4,10,S,9W	Pasture	100	1.56	1.74	☒ Yes ☐ No	☐
2.								☐ Yes ☐ No	☐
3.								☐ Yes ☐ No	☐
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.		
 Signature	Treatment Plant Manager Title	02/12/19 Date
Print Name: John P. Huntington		

2018 H2O &S Annual Biosolids Report Form

Facility Information

Name: H2O & S, Inc.

Location Address: Inn at Otter Rock

Otter Rock Loop, 1 Mile West of Highway 101

Mailing Address: 7757 SE 92nd Avenue, Portland, Oregon 97266

Contact Name: John P. Huntington

E-mail: hasenheld@yahoo.com

Permit Number

Permit Type: NPDES # 101269

WPCF: N/A

Telephone: 503-777-2909

Fax: 503-777-1547

Biosolids Process Descriptions

Generation

Wastewater Sources & Volumes

Gallons/yr

Municipal

13,068,000

Industrial

N/A

Septage

Not Allowed

Total Gallons

13,068,000 (13.07 MGD)

Solids Produced

Dry Tons (DT)/yr

Primary

N/A

Secondary

1.56DT

Other

N/A

Total DT

1.56DT

Preparation

Plant consists of one extended aeration channel, one 41,000 gallon aerobic digester, a 12,000 gallon aerobic batch tank, a 55,000 gallon clarifier, a chlorine contact chamber and an ocean outfall. The annual influent volume is 13,068,000 gallons.

Influent enters the facility at the bar screen, flow through a primary settling chamber then into an aeration basin (41,000 capacity). The flow then moves from the aeration basin to the clarifier and is returned to the aeration basin. Solids are target wasted to the sludge digester. The decantate from the clarifier flows to the chlorine contact chamber for disinfection prior to discharge from the outfall to the Pacific Ocean.

Storage

<u>Containers</u>	<u>Number of Units</u>	<u>Volumes of Each Container</u>	<u>= Total Volume</u>
Tanks	1	12,000 gallons	12,000 gallons
Aerobic Digester	1	41,000 gallons	41,000 gallons
TOTAL CAPACITY			53,000 gallons

Application

List transport equipment used from facility to site(s):

5,500 gallon tanker truck contracted from Zwald Transport of Tillamook

List application method and equipment used to apply at site:

The biosolids being applied, gravity flow out of the tanker truck through a splash plate, which evenly applies the biosolids on the field. Tanker speed is adjusted so that the amount of material and applied per acre is at or below the approved agronomic loading given in the DEQ site authorization.

Biosolids Quality

EQ ☐

Class A ☐

Class B ☒

Testing Frequency (times/yr)

	<u>1</u>	<u>4</u>	<u>6</u>	<u>12</u>
[In metric tons]	<290	>290>1500	1,500>15,000	>15,000
[In U.S. tons]	<319	319>1,650	1,650>16,500	>16,500

Test Data

Nutrient Monitoring

<u>Item</u>	<u>1st quarter</u>	<u>2nd quarter</u>	<u>3rd quarter</u>	<u>4th quarter</u>	<u>Average</u>
TKN	5.3				5.3
NO3-N	0.14				0.14
NH4-N	0.31				0.31
P	2.0				2.0
K	0.39				0.39
pH	6.7				6.7
T.S.*	1.7				1.7
V.S. **	77.0				77.0

All test data expressed in % dry weight (dw) except pH which is standard units.

* T.S. = Total Solids

**V.S. = Volatile Solids

Pollutant Monitoring

<u>Metals</u>	<u>1st quarter</u>	<u>2nd quarter</u>	<u>3rd quarter</u>	<u>4th quarter</u>	<u>Average</u>
Arsenic	18.2				18.2
Cadmium	1.6				1.6
Chromium	16.0				16.0
Copper	183.00				183.00
Lead	12.00				12.00
Mercury	0.00732				0.007
Nickel	16.00				16.00
Selenium	29.7				29.7
Zinc	687.00				687.00
Molybdenum	3.4				3.4

All test data expressed in mg/kg (ppm) based on dry weight.

Solids Treatment Processes

The EPA'S 40 CFR parts 503 and DEQ's Oregon Administrative Rules (OR) 340-50 allow permittees to use EPA approved alternatives to satisfy Class B biosolids pathogen or vector attraction reduction criteria. The H2O & s WWTP uses the following approved methods for treatment of its biosolids:

A. Pathogen Reduction-

Use of a process to significantly reduce pathogens (PSRP) 40 CFR 503.32(b)(3) Alt 2 #5. This involves sufficient use of an alkaline stabilization agent added to the sewage biosolids to raise the pH of the biosolids to 12 for ≥ 2 hours of contact (mixed).

B. Vector Attraction Reduction

As above, the plant uses addition of alkali to achieve vector reduction (40 CFR 503.33(b)(6)). This involves the addition of sufficient alkali to raise the pH of the biosolids to at least 12 S.U.s at 25C and maintain a pH of ≥ 12 for 2 hours and a pH of ≥ 11.5 for 22 more hours.

Biosolid Analysis Year

2018

final at 22,000 gallons

Source	Otter Crest	Lab analysis #	1507637	Date	06/27/18
File No.	41740	ALG (Analytical Lab Group)	*used in spreadsheet		
Phone No.	503.667.6735		541.485.8404		
Contact	John Huntington				

Nutrient and metals analysis are an average of representative sampling events taken over the year biosolids are land applied.
Nutrient and metal concentrations are determined from the current year's representative solids analysis.
Site loading rates for nutrients and metal must be adjusted based on current analysis to meet authorized site loading rates.

COLOR KEY

	requires entered value
	calculated value
	replace 1 with coefficient from selection

SOLIDS ANALYSIS

Cake Biosolid	1	0.85	Replace the 1 with the appropriate decimal
Liquid Biosolid	1	0.5	Dewater (10-50%) and Liquid
% Total Solids	1.7		
% Volatile Solids	77		

PATHOGEN REDUCTION

Class A Biosolid			Put X next to Class A if true
Class B Biosolid	503.32(b)(2)	X	Put X next to Class B if true
			Cite 503.32 Alternative

Fecal Coliform in put number 5,300
org.-100ml/1 dry gr.

VECTRO ATTRACTION REDUCTION (DIGESTION METHOD)

Volatile Solids Reduction Method	in put number	in put number	Cite 503.33 Option
----------------------------------	---------------	---------------	--------------------

Year
Source
File No.

2018
Otter Crest
41740

pg. 2

Anaerobic D.	1	0.2	Replace the 1 with the appropriate decimal
Aerobic D.	1	0.3	Replace the 1 with the appropriate decimal
Drying Bed	1	0.15	Replace the 1 with the appropriate decimal
Gal/yr.	22,000		

* Note If cake biosolids are generated then is total cubic yards instead of total gallons

Note biosolid cake conversion is 0.65 ton/ yd³

Pounds Equation

lb. TS/yr. = %TS x 8.34 x gal/yr.

Dry TS US ton/yr.	1.56
lb. TS/yr.	3119.00
Total US tons	1.56

105.92	Cubic yards hauled
70.798	Total US tons
141596	Total Lb.s
63.7182	Total Metric Tons

Conversion

US-> Metric tons multiply by 1.11

Metric -> US tons multiply by 0.9

Total Metric tons

1.40355

NUTRIENT ANALYSIS

	mg/kg dry-wt.	%
Total Organic	4.89	49900
TKN	5.3	53000
NH4	0.31	3100
NO3	0.14	1400
Phosphorus	2	20000
Potassium	0.39	3900

Organic N = (%TKN-%NH4)

Inorganic N = (%NH4 + %NO3)

	mg/kg dry-wt.	lb. / yr.	lb./ac-yr.	kg/ha
Phosphorus	20000	62.3800	35.85057	40.15264
Potassium	3900	12.1641	6.99086	7.82977

pH

6.7

Source 2018
File No. Otter Crest
41740

pg. 3

NITROGEN	mg/kg dry-wt.	lb. / yr.	lb./ac-yr.	kg/ha
Total Organic	4.99	155.6381	89.4472	100.1808
TKN	5.3	165.3070	95.0040	106.4045
NH4	0.31	9.6689	5.5568	6.2237
NO3	0.14	4.3866	2.50954	2.81069
lb. mineralized organic N/dry ton			99.8000	
lb. inorganic N/dry ton			5.1724	
Total lb. available N/ ton			104.972	

NUTRIENT LOADING

Crop nitrogen loading rate N lb./acre	100.000	112	kg/ha
Total acres land applied for year.	1.74		

Number dry tons land applied per acre	0.90	2.01	metric ton/ha
lb. Nitrogen per dry ton	108.80		
Total lb. Org-N produced per year	155.64		
Total lb. NH4 produced per year	9.67		
Total lb. NO3 produced per year	4.37	1.56	lb. N / yd ³
Total lb. Available N per year	169.67	0.01	lb. N / gallon
Min. number of acres required per year (Nitrogen)	1.70		

BIOSOLID METALS ANALYSIS AND CALCULATIONS

Sample calculation:

$$(((5.0 \text{ mg As} / 1000000 \text{ mg TS} \times 140000 \text{ lb. Total Solids}) = 0.07 \text{ lb. As/yr.}$$

$$(((5.0 \text{ mg As} / 1000000 \text{ mg TS}) \times 140000 \text{ lb. TS}) / 52 \text{ ac} = 0.013 \text{ lb. As/ac-yr.}$$
(EPA cumulative loading 41 total lb. As/ac / 0.013 lb. As/ac/yr.) = 2719.3 yr. site life for As
(0.013 lb. As/ac-yr.) x 1.12 conversion factor = 0.015 kg/ha-yr.
(2.6 tons biosolid is equivalent to a loading rate of 100 lb. total available N/ac) .

Metal Analysis	mg/kg dry-wt.	
Arsenic	18.2	
Cadmium	1.6	
Chromium	16	
Copper	183	
Lead	12	
Mercury	0.00732	
Molybdenum	3.4	2
Nickel	16	
Selenium	29.7	
Zinc	687	

Biosolid Metal Loadings in comparison to 40 CFR Part 503.13 Table 1 Ceiling Limits

	Biosolid concentration	Ceiling Limits 503.13	Ceiling Limits 503.13	Yearly Loading Metal lbs./yr.	Yearly Loading Metal lbs./ac-yr.	Yearly Loading kg/yr.
Metals	mg/kg	Table 1 Conc mg/kg	Table 1 metal lb./ton biosolid			
Arsenic	18.2	75	0.150	0.05677	0.03262	0.037
Cadmium	1.6	85	0.170	0.00499	0.00287	0.003
Chromium	16	1200	2.400	0.04990	0.02868	0.032
Copper	183	4300	8.600	0.57078	0.32803	0.367
Lead	12	840	1.680	0.03743	0.02151	0.024
Mercury	0.00732	57	0.114	0.00002	0.00001	0.000
Molybdenum	3.4	75	0.150	0.01060	0.00609	0.007
Nickel	16	420	0.840	0.04990	0.02868	0.032
Selenium	29.7	100	0.200	0.09263	0.05324	0.060
Zinc	687	7500	15.000	2.14275	1.23147	1.379

There is no Ceiling limit for Chromium, table value is a past limit that is no longer valid, Cr is used here for loading calculations only.

Biosolid Metal Loadings in comparison to 40 CFR Part 503.13 Table 2 Cumulative Limits

	Analysis Biosolid conc. mg/kg	Cumulative Pollutant Limits		Yearly lb. Metal per ton biosolids	Biosolid Loading lb./ac-yr.	Biosolid Loading kg/ha-yr.
		CFR 503.13 Table 2 mg/ha	40 CFR 503.13 Table 2 metal lb./ac biosolid			
Metals						
Arsenic	18.2	41	45.920	2.548	1.4644	1.640
Cadmium	1.6	39	43.680	0.224	0.1287	0.144
Chromium	16	1200	1344.000	2.240	1.2874	1.442
Copper	183	1500	1680.000	25.620	14.7241	16.491
Lead	12	300	336.000	1.680	0.9655	1.081
Mercury	0.00732	17	19.040	0.001	0.0006	0.001
Molybdenum	3.4	75	84.000	0.476	0.2736	0.306
Nickel	16	420	470.400	2.240	1.2874	1.442
Selenium	29.7	100	112.000	4.158	2.3897	2.676
Zinc	687	2800	3136.000	96.180	55.2759	61.909

There are no limits for Chromium or Molybdenum under Table 2, Mo concentration comes from Table 1. Ceiling Limit.

Biosolid Metal Loadings in comparison to 40 CFR Part 503.13 Table 3 Pollutant Concentration Loading Limits

	Biosolid Analysis mg/kg	Pollutant Conc. Limits		Loading lb./ac-yr.	Loading kg/ha-yr.	Site Life in years
		Table 3 mg/ha	lb. Metal per /ac biosolid			
Metals						
Arsenic	18.2	41	45.920	0.033	0.037	1122
Cadmium	1.6	39	43.680	0.003	0.003	12141
Chromium	16	1200	1344.000	0.029	0.032	37357
Copper	183	1500	1680.000	0.328	0.367	4083
Lead	12	300	336.000	0.022	0.024	12452
Mercury	0.00732	17	19.040	0.000	0.000	1158788
Molybdenum	3.4	75	84.000	0.006	0.007	10987
Nickel	16	420	470.400	0.029	0.032	13075
Selenium	29.7	100	112.000	0.053	0.060	1677
Zinc	687	2800	3136.000	1.231	1.379	2030

There are no limits for Chromium or Molybdenum under Table 3, Mo concentration comes from Table 1. Ceiling Limit.

40 CFR 503.13 Tables 1-4.

T1, Ceiling loading, bulk biosolids sold or given away, bag or container, can not exceed pollutant concentration Table 1.

T2, Cumulative Loading, has to meet Table 1 and 2 limits, no lawn/garden Class A no ability to tract.

T3, Pollutant Concentration , bulk biosolid land applied on agriculture land, forest,
public contact site or reclamation site has to meet Tables 1 &3.

T4, Annual Pollutant loading Rate, for land application of Class A biosolid
given away in bag or container, has to meet Table 1 & 4.



ALG ORELAP ID #OR100012
361 West 5th Ave
Eugene, OR 97401
TEL: (541) 485-8404 FAX: (541) 484-5995
Website:

July 25, 2018

John Huntington
H2O & S, Inc.
7757 SE 92nd Ave.
Portland, OR 97266
TEL: (541) 992-0622
FAX (541) 764-2206

RE: Inn at Otter Crest

Order No.: 1806D46

Dear John Huntington:

Analytical Laboratory Group received 3 sample(s) on 6/27/2018 for the analyses presented in the following report.

The analysis was performed according to our laboratory's NELAP/TNI-approved quality assurance program. Any exceptions to this quality assurance program are noted on the case narrative.

Testing methods used are sufficiently sensitive enough to meet the requirements that support client/permittee NPDES permits that we have on file. The client is responsible for reviewing reports. The permittee is responsible for meeting permit limits.

Quality control data is within laboratory defined or method specified acceptance limits except if noted on the case narrative.

If you have any questions regarding these tests results, please feel free to call.

A handwritten signature in cursive script that reads "Kimberly J. Reeve Morghan".

Kimberly Reeve Morghan
Quality Manager
361 West 5th Ave
Eugene, OR 97401



ALG ORELAP ID #OR100012

361 West 5th Ave

Eugene, OR 97401

TEL: (541) 485-8404 FAX: (541) 484-5995

Website:

Analytical Report

Date Reported: 7/25/2018

WO#: 1806D46
CLIENT: H2O & S, Inc.
Project: Inn at Otter Crest

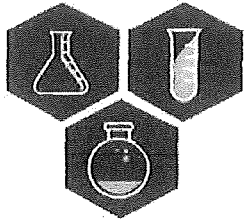
Received Date: 6/27/2018 3:25:00 PM
Sampler Name: John P Huntington
Matrix: Biosolid

Lab ID: 1806D46-001	Client Sample ID	Aerobic Digester Grab		Collection Date: 6/27/2018 9:35:00 AM				
Analyses	Method	Result	Qual	PQL	LOD	Units	Date Analyzed	Analys
Nitrate	EPA 300.0	0.14		0.010	0.0050	% Dry W	06/28/18 16:52	TG
Ammonia-N	EPA 350.2	0.31		0.010	0.0050	%-dry	07/09/18 10:50	TG
Hydrogen Ion (pH)	EPA 9040C	6.7	H	0	0	pH Units	06/27/18 17:03	TN
Phosphorus, Total (As P)	EPA 365.3	2.0		0.010	0	% Dry W	06/29/18 14:17	RV
Percent Moisture	D2216	98		0.10	0	%	07/03/18 15:35	RV
Nitrogen, Kjeldahl, Total	EPA 351.3	5.3		0.010	0	% Dry W	07/13/18 10:00	ER
Total Solids	EPA 160.3	1.7		0.10	0	%	07/03/18 15:35	RV
Volatile Solids	EPA 160.3	77		0.10	0	%	07/03/18 15:35	RV

Lab ID: 1806D46-002	Client Sample ID	Aerobic Digester Grab		Collection Date: 6/27/2018 9:35:00 AM				
Analyses	Method	Result	Qual	PQL	LOD	Units	Date Analyzed	Analys
Percent Moisture	D2216	98		0.10	0	%	06/29/18 16:27	RV
Total Solids	EPA 160.3	1.7		0.10	0	%	06/29/18 16:27	RV
Coliform, Fecal	SM 9221 E	5,300		5.9	0	MPN/gra	06/27/18 17:26	JL

Definitions: A Accredited by ORELAP
LOD Limit of Detection
MCL Maximum Contaminant Level
ND Not Detected at the Reporting Limit
PL Permit Limit
PQL Practical Quantitation Level or Reporting Limit

Qualifiers: H Holding times for preparation or analysis exceeded



NEILSON RESEARCH CORPORATION

Environmental Testing Laboratory

7/24/2018

Cynthia O Kelley
Analytical Laboratory Group, Inc.
361 West Fifth Avenue
Eugene, OR 97401

TEL: (800) 262-5973

FAX: (541) 484-5995

RE: 1806D46

Order No.: 1806C55

Dear Cynthia O Kelley:

Neilson Research Corporation received 1 sample(s) on 6/29/2018 for the analyses presented in the following report.

The results relate only to the parameters tested or to the sample as received by the laboratory. This report shall not be reproduced except in full, without the written approval of Neilson Research Corporation. If you have any questions regarding these test results, please feel free to call.

Sincerely,
Neilson Research Corporation

Tamra R. Schmedemann
Project Manager

Neilson Research Corporation

245 South Grape Street, Medford, Oregon 97501 541-770-5678 Fax 541-770-2901

Analysis Report

ORELAP 100016
EPA OR00028

Analytical Laboratory Group, Inc.

361 West Fifth Avenue

Eugene, OR 97401

Client Sample ID: 1806D46-003A

Sample Location: Digester Grab

Project: 1806D46

Lab Order: 1806C55

NRC Sample ID 1806C55-01A

Collection Date: 6/27/2018 9:35:00 AM

Received Date: 6/29/2018 9:30:00 AM

Reported Date: 7/24/2018 3:09:15 PM

Matrix: Solid

ANALYTICAL RESULTS

Analyses	Result	Qual	MDL	MRL	Units	DF	NELAP	Date Analyzed
TRACE METALS								
	EPA 7471A							
Mercury	0.00732		0.0000227	0.00199	mg/Kg	1	A	Analyst: JWC 7/12/2018
TRACE METALS								
	EPA 6010B							
Arsenic	ND		18.2	294	mg/Kg-dry	1	A	Analyst: JWC 7/12/2018
Cadmium	1.6	J	0.988	58.9	mg/Kg-dry	1	A	7/12/2018
Chromium	16	J	0.988	294	mg/Kg-dry	1	A	7/12/2018
Copper	183	MI	3.49	58.9	mg/Kg-dry	1	A	7/12/2018
Lead	12	J	4.27	294	mg/Kg-dry	1	A	7/12/2018
Molybdenum	3.4	J	1.45	294	mg/Kg-dry	1	A	7/12/2018
Nickel	16	J	2.77	29.4	mg/Kg-dry	1	A	7/12/2018
Potassium	3880		280	294	mg/Kg-dry	1	A	7/12/2018
Selenium	ND		29.7	294	mg/Kg-dry	1	A	7/12/2018
Zinc	687	MI	11.6	294	mg/Kg-dry	1	A	7/12/2018
% TOTAL SOLIDS								
	SM 2540G							
Total Solids	1.70		0.0100	0.01	%	1	A	Analyst: SCM 7/3/2018

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	ND	Not Detected at the Minimum Reporting Limit
	S	Spike Recovery outside accepted recovery limits		

Analytical Laboratory Group, Inc.

361 WEST FIFTH AVENUE

EUGENE, OREGON 97401

800-262-5973/541-485-8404 Fax 541-484-5995

Email: alglabs@alglabsinc.com



CHAIN OF CUSTODY

Attention: Cynthia O'Kelley				Client: Analytical Laboratory Group, Inc			
Phone: 541-485-8404				Address 361 West 5th Avenue			
Fax: 541-484-5995				Eugene, OR 97401			
Client Project: Neilson Subcontract				ALG PO# 180628-01			
Lab ID	ALG Sample ID	ALG Client ID	Sample Matrix & Description Grab/Comp	Collection		Bottles	Analysis Requested
				Date	Time		
CIA	1806D46-003A	Digester Grab	BioSolid/Grab	6/27/18	0935	P	503 Biosolids Metals: As, Cd, Cr, Cu, Pb, Mo, Ni, K, Se, Zn, Hg by EPA 6010B/7471A; Total Solids by EPA 2540G

Notes:

Please Return Shipper
Include: MDL
Report mg/Kg-dr

Turn Around Time Requested:			Shipped Via:			Refrigerated		
NORMAL			UPS			YES 230		
SOC and PO made by:		Date	Time	Received by:		Date	Time	
Rhonda Hill		6/28/18	13:12					
Relinquished by:		Date	Time	Received by:		Date	Time	
Relinquished by:		Date	Time	Received by Laboratory:		Date	Time	
				J. Merrill		6-29-18	930	

Analytical Laboratory Group, Inc.

361 WEST FIFTH AVENUE

EUGENE, OREGON 97401

800-262-5973/541-485-8404 Fax 541-484-5995

Email: alglabs@alglabsinc.com

NPUC

CHAIN OF CUSTODY

Attention: John Huntington

Client: H2O & S, Inc.

Phone: 503-667-6735

Address: 7757 SE 92nd Avenue

Email: hasenheld@yahoo.com

City, State, Zip Portland, OR 97266

Client Project: Inn at Otter Crest

Sampler: Print

John P. Huntington

Sampler: Signature

John P. Huntington

Client ID	Sample Matrix & Grab/Comp	Collection		Analysis Requested	Bottles - Lab Use Only				
		Date	Time		Type	#	Pres	T °C	Lab ID
Aerobic Digester <i>Per John 6/27/18 CO</i>	Biosolid/Grab	6/27/18	9:35	503 Biosolids					
		6/27/18	9:35	NO3 pH TS VS PMoist	J	1		7.7	001A
		6/27/18	9:35	NH3 TP TKN	JS	1	H2SO4	8.4	001B
		6/27/18	9:35	Metals: As Cd Cr Cu Pb Mo Ni K Se Zn Hg	P	1		9.4	001C
		6/27/18	9:35	Biosolids Fecal Coliform	SSC	1			002A

Notes:

Deliver to Lab no later than 6 hours following sample collection. Please notify the lab in advance. Fill sample containers completely and refrigerate samples.

We need results by 08/03/18

*John P. Huntington
Plant Manager*

Preservation Check

Lab ID	Date/Time	Pre-Preserved	pH	Tech

Turn Around Time Requested (Rush incurs a Surcharge):

☒ NORMAL ☐ RUSH

Shipped Via:

ALG Courier

Refrigerated

Ice

Relinquished by:

John P. Huntington

Date Time

6/27/18

Received by:

Jeffrey

Date Time

6/27/18 11:30

Relinquished by:

Date Time

Received by:

Relinquished by:

Date Time

6/27/18 15:25

Received by Laboratory:

Date Time

6/27/18 15:25

of 50 lbs. bags of Hydrated Lime Added to Batch Tank 19 (keep air running)

Initial pH measurements from 5 random samples in batch tank (pH ≥ 12)

All pH measured using calibrated automatic temperature compensation probe

Date 8/8/18 time 12:45 PM initials JPH

Sample 1		Sample 2		Sample 3		Sample 4		Sample 5	
Temp	PH	Temp	PH	Temp	PH	Temp	PH	Temp	pH
22.0°C	12.2	22.0°C	12.2	22.0°C	12.2	22.0°C	12.2	22.0°C	12.2

2 hour pH measurements from 5 random samples in batch tank (pH ≥ 12)

Date 8/8/18 time 14:45 PM initials JPH

Sample 1		Sample 2		Sample 3		Sample 4		Sample 5	
Temp	PH	Temp	PH	Temp	PH	Temp	PH	Temp	pH
22.0°C	12.3	22.0°C	12.3	22.0°C	12.2	22.0°C	12.2	22.0°C	12.2

22 (24 hour total) hour pH measurements from 5 random samples in batch tank (pH ≥ 11.5)

Date 8/9/18 time 12:45 AM initials JPH

Sample 1		Sample 2		Sample 3		Sample 4		Sample 5	
Temp	PH	Temp	PH	Temp	PH	Temp	PH	Temp	pH
21.5°C	12.0	21.0°C	12.1	21.0°C	12.0	21.0°C	12.1	21.5°C	12.0

Gallons hauled to field 22,000 on date 8/10/18 initials JPH

Stabilized biosolids must be hauled in a minimum of 48 hours after last test, if more than 48 Hours must demonstrate (re-test) that a pH of 11.5 or higher has been maintained, if not the stabilization process must be repeated.

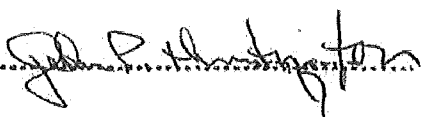
Date 8/10/18 time 6:00 AM initials JPH

Sample 1		Sample 2		Sample 3		Sample 4		Sample 5	
Temp	PH	Temp	PH	Temp	PH	Temp	PH	Temp	pH
20.5°C	11.8	21.0°C	11.7	21.0°C	11.9	20.5°C	11.6	20.5°C	11.8

8/14/2010

Attachment D:

"I certify, under penalty of law, that the pathogen requirements in 503.32(b)(2) alternative 1, the management practices in 503.14 and the vector attraction reduction requirements in 503.33(b)(1) have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements and vector attraction reduction requirements have been met. I also certify that all biosolids were land applied at the approved agronomic loading rate noted in the respective Department site authorization letter. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

Signature.......... Date.....8/10/18.....