CITY OF SALEM, OREGON
DEPARTMENT OF PUBLIC WORKS
WILLOW LAKE WATER POLLUTION CONTROL FACILITY

2019
BIOSOLIDS PROGRAM
ANNUAL REPORT

Reporting Period: January 1, 2019 - December 31, 2019

PREPARED FOR

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

NPDES Permit Number 101145

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Section 2:
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CITY OF SALEM AND CONTRACTOR INFORMATION

Name and address of person(s) performing biosolids reuse activities for Willow Lake Water Pollution Control Facility:

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road North
Salem, OR 97303

Contacts: Jue Zhao, Wastewater Division Manager **Phone:** 503-588-3480
Mark Stevenson, Residuals & Hauled Waste Supervisor **Phone:** 503-763-3479

Ossprey LLC.	**Service:**	Summer Cake Application
PO Box 980	**Contact:**	Fanny Etzel
Jefferson OR 97325	**Phone:**	360-225-9094

Horner Enterprises Inc	**Service:**	Winter Long Distance Hauling
PO Box 442	**Contact:**	Jay Horner
Sweet Home OR 97386	**Phone:**	541-979-2099

Tribeca Transport LLC.	**Service:**	Summer Augment Cake Liquid & Transport & Application
1415 Port Way	**Contact:**	Eric Thwaites
Woodland WA 98674	**Phone:**	360-518-0041

Goodman Sanitation Inc.	**Service:**	Winter Application
931 NE Harlow Rd	**Contact:**	Alex Mauck
Troutdale OR 97060	**Phone:**	503-666-2280

Section 3:
Signed Certification Statements

2019
CERTIFICATION STATEMENT: CITY OF SALEM

1. Facility Identification

Facility Name:	**Willow Lake Water Pollution Control Facility**
Ownership:	City of Salem, Oregon (Municipality)
Address:	5915 Windsor Island Road North Salem, OR 97303
Telephone Number:	(503) 588-6380
Facility Contacts:	Jue Zhao Wastewater Services Division Manager Mark Stevenson Residuals and Hauled Waste Manager
Ownership Director:	Mr. Peter Fernandez Public Works Director 555 Liberty St. SE, Room 325 Salem, OR 97310-3503 (503) 588-6008

2. Reporting Period: January 1, 2019- December 31, 2019

3. NPDES Permit Number: 101145 (Renewed on November 18, 2004)

4. Facility Status: Preparer of Biosolids

5. Biosolids Production: **3153.23** Dry Tons
2860.56 Metric Tons

6. Final Utilization Method: Land Application by Preparer and Contractor

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

5/1/2020

Jue Zhao
Wastewater Services Division Manager — Date Signed

Mark E Stevenson 5/1/2020

Mark Stevenson
Residuals and Hauled Waste Manager — Date Signed

Certification Statement for Pathogen and VAR Requirements

POTW Willow Lake Water Pollution Control Facility

Source Name: Anaerobically- Digested Liquid Biosolids

Source Period: 01-Jan-2019 to 31-Dec-2019

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)(3) Appendix B, PSRP Condition 3-(anaerobic digestion) and the Vector Attraction Reduction requirements in 40 CRF part 503.33(b)(2)-(anaerobic digestion) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gathered and evaluated this information.

Mark E Stevenson

May 1, 2020

Mark Stevenson, Residuals and Hauled Waste Manager Date

I certify, under penalty of law, 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.

Mark E Stevenson

May 1, 2020

Mark Stevenson, Residuals and Hauled Waste Manager Date

Certification Statement for Pathogen and VAR Requirements

POTW Willow Lake Water Pollution Control Facility

Source Name: Anaerobically-Digested Dewatered Biosolids

Source Period: 01-Jan-2019 to 31-Dec-2019

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)(3) Appendix B, PSRP Condition 3-(anaerobic digestion) and the Vector Attraction Reduction requirements in 40 CRF part 503.33(b)(2)-(anaerobic digestion) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gathered and evaluated this information.

Mark E Stevenson

May 1, 2020

Mark Stevenson, Residuals and Hauled Waste Manager Date

I certify, under penalty of law, 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.

Mark E Stevenson

May 1, 2020

Mark Stevenson, Residuals and Hauled Waste Manager Date

Certification Statements for Site Management Requirements

Class B biosolids are subject to management practice restrictions specified in 503.14. These requirements are consistent with Salem's DEQ approved site authorization and management plan conditions. Site restrictions [(503.32(b)(5)] are met by limiting public access and controlling agricultural practices. In addition, records of cumulative metals additions are maintained under 503.13(a)(2)(I) to assure that regulated trace inorganic pollutant additions do not exceed 503.13(b)(2), Table 2 limits. Monitoring of biosolids produced after January 1, 2019, reveals pollutant concentrations fall well within 503.13(b)(3), Table 3 limits. Records of all biosolids applied to the sites have been maintained by both the City and the biosolids applicator. Presently zinc is the limiting metal and the calculated site life at current application rates is approximately 436 years.

The following certification statements are required from the biosolids applicator, City of Salem, Willow Lake Water Pollution Control Facility (WLWPCF).

"I certify, under penalty of law, that the site management practices in 503.14 and the site restrictions in 503.32(b)(5) have been met. This determination has been made under direction and supervision of the City of Salem in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices and site restrictions have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

Mark E Stevenson

May 1, 2020

Mark Stevenson, Residuals and Hauled Waste Manager Date

"I certify, under penalty of law, that the requirements to obtain information in 503.12(e)(2) have been met for each site on which bulk Class B biosolids (sewage sludge) are applied. This determination has been made under direction and supervision of the City of Salem in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the requirements to obtain information have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

Mark E Stevenson

May 1, 2020

Mark Stevenson, Residuals and Hauled Waste Manager Date

Section 4:
2019 Annual Biosolids Report

2019 ANNUAL BIOSOLIDS REPORT

Introduction

The City of Salem owns a municipal sewage collection system and two wastewater treatment facilities, the Willow Lake Water Pollution Control Facility (WLWPCF) and the River Road Wet Weather Treatment Facility (RRWWTF), that are operated under the National Pollutant Discharge Elimination System Permit Number 101145, Department of Environmental Quality (DEQ) File No. 78140.

The WLWPCF provides wastewater treatment for a population of approximately 229,000, including Salem, Keizer, Turner, and unincorporated parts of Marion County. In 2019, total annual rainfall recorded at the WLWPCF was 27.21 inches. The annual wastewater flow totaled 13.02 billion gallons.

Septage is accepted at a receiving facility located at the Septic Receiving Station at the Salem Airport approximately 11 miles from the WLWPCF. The facility received an annual total **of** 22,917,430 gallons of septage which was conveyed to the WLWPCF for treatment.

Salem also manages an Environmental Protection Agency (EPA) approved pretreatment program which oversees 42 permitted dischargers including several categorical industries (see Table 1: 2019 City of Salem - Permitted Industries).

The WLWPCF conducts land application of biosolids on local, authorized sites from early spring through October each year. During the winter months and periods of local inclement weather, dewatered biosolids are hauled to authorized sites in Eastern Oregon for land application or stored onsite to be land applied on local, authorized sites during the summer season.

Wastewater Processing Systems

The WLWPCF is sited on 40 acres between the City of Keizer's urban growth boundary and the Willamette River in Marion County, Oregon. The facility is designed for an average dry weather flow of 35 million gallons per day (mgd). Plant upgrades completed in 2010 increased the design peak wet weather flow to 155 MGD. Treated effluent is discharged to the Willamette River at River Mile 78.4.

Wastewater treatment processes include mechanical screening, primary and secondary treatment, sludge thickening, anaerobic digestion, solids dewatering, chlorine disinfection, and dechlorination. The facility can operate in a variety of secondary treatment modes, including trickling filter, conventional air activated sludge, and trickling filter/air activated sludge. These secondary treatment processes provide flexibility for wide variations in Biochemical Oxygen Demand (BOD) resulting from increased loading rates during vegetable canning season.

The RRWWTF is sited at River Road Park approximately 4 miles upstream from the WLWPCF on the 72-inch interceptor. The RRWWTF is designed to receive flows which exceed the hydraulic capacity of WLWPCF. Utilizing interceptor diversion gates for flow control, the facility provides secondary treatment and disinfection for excessive flows during storm events. The RRWWTF is designed for a nominal daily flow of 50 mgd and a peak hour flow of 75 mgd. Treated effluent is discharged to the

Willamette River at River Mile 82.6.

The RRWWTF treatment processes include fine screening, high rate clarification (HRC) utilizing polymer and micro-sand for coagulation, and Ultraviolet (UV) disinfection. Influent flow is passed through screening channels prior to coagulation treatment. Solids in excess of 6 mm in diameter are returned to the 72-inch interceptor sewer for transport to the WLWPCF.

The City's treatment plant staff works collectively to prevent Sanitary Sewer Overflows (SSOs) by utilizing flow routing options for optimum conveyance and effective treatment capacity. The combined design peak wet weather flow for the WLWPCF and the RRWWTF is 205 mgd.

Solids Treatment Processes

Solids from primary treatment processes are thickened in one of three gravity thickeners. Solids from secondary treatment are thickened on a Gravity Belt Thickener. Typically, solids are thickened to approximately five percent prior to mesophilic primary/secondary anaerobic digestion.

The south digester facility is composed of two gas-mixed, fixed cover, primary digesters which overflow to two secondary digesters. The north digester facility is composed of two mechanically mixed, fixed cover, primary digesters which overflow to a floating dome, secondary digester. The digester facilities produce gas that provides fuel for the cogeneration system. Each primary digester is externally heated with coiled heat exchangers using a modified hot water loop from the cogeneration system. Boilers are connected to the heat loop as a redundant auxiliary heat source.

Annual Digester Feed Gallons

The WLWPCF produced a total of 35,657,812 gallons of thickened primary and secondary sludge in 2019 which were fed to the primary digesters. The primary and secondary sludge flow streams were divided between the north and south digester facilities using magnetic flow meters and automated feed valves. Approximately 56 percent of the treatment plant's solids production was stabilized in the larger south primary digesters while the north facility received 43.4 percent (see Table 6: 2019 Digester Balance: In Versus Out). The remaining 0.4 percent of the digester volumes consists of received sludge from other municipal wastewater treatment facilities.

Contracted Sludge and Waste Products Received

In 2019, the WLWPCF received sludge and biosolids products from one (1) other municipal wastewater treatment facilities in Oregon, each constituting 0.5 percent or less of the total digester volume, as follows:

- A total of 153,000 gallons of aerobic digested biosolids and waste activated sludge from Aurora in January – March, April, June, August, October, November, and December.

These solids were received, sampled, and sent directly to the digesters. Pumping was scheduled to facilitate a standard 60/40 flow split between the two (North and South) digester complexes using the automated feed valves. Volatile solids concentrations were very similar to Salem's and within the typical range of domestic biosolids at about 80 percent of total solids.

Design organic loading on the primary digesters is approximately 0.23 pounds volatile solids/day/cubic feet of digester volume. The average organic loading on the primary digesters in 2019 was 0.063 volatile pounds/day/cubic feet of digester volume. This figure reflects the calculated sum of received and produced solids entering the primary digesters (see Table 2: 2019 Digester Volatile Feed Pounds).

Class B Biosolids – Pathogen Reduction

All biosolids produced in 2019 met the Class B Pathogen Reduction requirements as specified in 40 CFR §503.32(b) (3), Appendix B: Processes to Significantly Reduce Pathogens (PSRP), Item 3, which states: Anaerobic digestion - Sewage sludge is treated in the absence of air for a specific Mean Cell Residence Time (MCRT) at a specific temperature. Values for the MCRT and temperature shall be between 15 days at 35 to 55 degrees Celsius and 60 days at 15 degrees Celsius (see signed Certification Statements in Section 2).

The annual average MCRT (four primary digesters) was 45.6 days and ranged between 32.2 and 58.1 days at an average temperature of 98.8 degrees Fahrenheit or 37.1 degrees Celsius (see Table 3: 2019 Digester Performances: Monthly and Annual Averages).

Class B Biosolids – Vector Attraction Reduction (VAR)

All biosolids produced in 2019 met the Class B Vector Attraction Reduction (VAR) requirements as specified in 40 CFR §503.33(b) (1) which states: The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent (see signed Certification Statements in Section 2).

The average volatile solids reduction rate in the digesters ranged between 64.1 and 73.8 percent (see Table 4: 2019 Volatile Solids Reduction: Monthly and Annual Averages).

Biosolids Analyses

Samples of liquid, centrifuge dewatered and BFP dewatered biosolids were composited separately and analyzed for pollutants listed in 40 CFR §503.13, Table 1, and for Total Solids, Total Volatile Solids, pH, and nutrients, including Total Kjeldahl Nitrogen (TKN), Nitrate-nitrogen (NO_3-N), Ammonia-nitrogen (NH_3-N), Phosphorus (P), and Potassium (K). During the months that each biosolids product was generated, the biosolids sampling and analyses were conducted monthly or more often than the frequency of once per 60 days that is required in 40 CFR §503.16, Table 1, and is based on the annual amount of biosolids applied to the land. All biosolids analyses were performed in-house (see Tables 5a, 5b and 5c: 2019 Monthly Biosolids Analyses).

Raw digester feed and received solids were analyzed for total solids and total volatile solids daily. Primary digester feed rates and temperatures were also recorded daily. Primary digester alkalinity and pH were measured three times per week. Monthly averages were used to calculate total volatile solids reduction.

When producing dewatered products, biosolids samples (centrate, pressate, feed solids, and dewatered product) were collected every four hours. During local liquid application, biosolids samples were taken

when filling the tanker trucks.

Biosolids Production Quantity

A total of 38,706,835 gallons of digested biosolids were utilized to produce centrifuge dewatered, BFP dewatered, and liquid biosolids products in 2019. The proportions of each product were:

- Centrifuge dewatered biosolids: 69.31percent or 26,827,220 gallons
- BFP dewatered biosolids: 23.48 percent or 9,086,615 gallons
- Liquid biosolids: 7.22 percent or 2,793000 gallons (See Table 6: 2019 Digester Balance: In Versus Out)

Based on the monthly composite sample analyses which were used to calculate monthly dry ton values for these biosolids products, a total of 3,124.14 dry tons was produced in 2019 (see Table 7: 2019 Biosolids Products Generated).

Dewatered Biosolids Production and Polymer Costs

Details of Salem's dewatered biosolids production in 2019, including polymer dosages, capture rates and costs, are provided in Table 8: 2019 Centrifuge and Belt Filter Press Production. Average daily total solids concentrations for the various flow streams (centrate, pressate, feed solids, and dewatered product) were used to estimate polymer costs in Table 8 rather than the monthly composite sample results. The combined polymer cost for dewatered biosolids (BFP and Centrifuge) production in 2019 was $263,755.

Biosolids Application, Storage and Disposal Quantities

Salem land applied a total of 2,662.23 dry tons of biosolids on a total of 1262 acres in 2019. These totals were comprised of 19 applications of Class B biosolids (liquid and dewatered) on all or part of 24 DEQ-authorized sites in hay, grass seed and pasture. Amounts that were land applied in 2019 included:

- 932.91 dry tons of centrifuge dewatered biosolids from 2018-19 winter application on 438 eastern Oregon application sites.
- 1216.75 dry tons of BFP and CENT dewatered biosolids applied on 448 acres locally
- 254.89 dry tons of liquid biosolids applied on190 acres
- 256.68 dry tons of CENT dewatered biosolids on 186 acres of eastern Oregon 2019-20 winter application sites.

There was 491 dry tons of Biosolids staged at Storage site at WLWPCF. The dewatered biosolids transported to approved Eastern Oregon winter land application sites during this winter season (2018-19) was Centrifuge dewatered biosolids. The current acreage at Filbin Ranches (Approved Winter land application sites in Eastern Oregon) of 598 acres will need to rest for a year. City of Salem is currently in the final stages of getting authorization of 574 acres, which is projected to be plenty of acreage to apply the biosolids produced for the remaining of the 2020-21 winter season.

The WLWPCF certifies that all biosolids products were applied to the DEQ-authorized sites in 2019 at rates consistent with the allowable rates of plant available nitrogen (PAN) specified in the DEQ site authorization letters (see signed Certification Statements in Section 2). Site restrictions identified in the DEQ site authorization letters specifically and those outlined in 40 CFR §503.32 (b) (5) were also followed.

Liquid biosolids were applied using 6,000 gallon pressurized tanker trucks at application rates pre-approved by the DEQ. The average annual application rate of 1.33dry tons per acre yielded an average of 111.60 pounds of PAN per acre.

Dewatered biosolids were transported to sites using tarp-covered semi-end dump trailers. Dewatered product was applied using a tractor and manure spreader. The average annual application rate of 2.55 dry tons per acre provided approximately 100.69 pounds of PAN per acre.

The total pounds of nutrients applied to the fields in 2019 were:

- 115,055.99 pounds of PAN
- 81,287.00 pounds of P
- 13,734.03 pounds of K

Application Site Management

Setback distances, restrictions and site management conditions are specified in the DEQ authorization letters for each site that received biosolids through land application. The WLWPCF Biosolids Program staff use a Global Positioning System (GPS) to accurately measure acreage and to mark setbacks or buffer zones around wells, structures, surface water features, roads, and property lines. A minimum setback of 50 feet to surface waters is required, as is a setback of 200 feet to wells. Application site worksheets and maps were completed daily for each site during land application. Biosolids Program staff and augment contract service staff carry route maps and a copy of the DEQ site authorization letters when in transport to application sites and during field applications.

Soil samples collected from the sites each year are analyzed for percent organic matter, pH, cation (Ca, Mg, Na and K) concentrations, cation exchange capacity (CEC), NO_3-N, and available P (using the Bray 1 or "weak" Bray method). Domestic wells on the sites and on adjoining properties are analyzed for NO3-N as requested by property owner(s). To date, the City's monitoring of site soils and wells on properties adjacent to Salem's authorized sites have not revealed any problems related to the beneficial reuse of biosolids via land application at agronomic rates.

The results of soil and well testing are included in the reports to farmers along with an estimate of the economic value of biosolids applications. In 2019, these values were based on prices for fuel and fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9, 2020 for average 2019 Fuel and Fertilizer prices, and an assumed hourly wage of $14 for labor (see Section 5: Application Site Reports). In 2019, the WLWPCF Biosolids Program saved its participating farmers a total of $116,328.45.

Biosolids Spill Incidents

The City of Salem's Biogro Program had no biosolids spill incidents in 2019.

Anticipated Biosolids Production and Acreage Requirements For 2020

Salem anticipates very little change concerning biosolids production and acreage requirements in 2020. Annual biosolids production is anticipated to fall within the range of 3,100 and 3,400 dry tons. Although the acreage of authorized sites is sufficient at this time, a few farmers have indicated a desire to have more acreage authorized in the future.

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

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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: 2019

B. PERMIT INFORMATION

1.	Permit Type (select one): ■ NPDES or ☐ WPCF	DEQ File No.: 78140
	DEQ Permit No.: 101145	EPA Permit No.: ORL026409

C. FACILITY INFORMATION

1.	Legal name of facility: Willow Lake Water Pollution Control Facility		
2.	**Physical address**		
	Street Address: 5915 Windsor Island Road N.		
	City: Salem	State: OR	Zip code: 97303
3.	**Mailing address** ■ Same as physical address.		
	Mailing Address:		
	City:	State:	Zip code:
4.	**Facility Type (check all that apply)**		
	■ 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

1.	**Responsible official**		
	Name: Jue Zhao	Title: Wastewater Plant Manager	
	Email Address: jzhao@cityofsalem.net	Telephone: 503-588-6380	
	Mailing Address: 5915 Windsor Island Road N.		
	City: Salem	State: OR	Zip code: 97303
2.	**Biosolids contact** ☐ Same as responsible official		
	Name: Mark Stevenson	Title: Residuals and Hauled Waste Supervisor	
	Email Address: mstevenson@cityofsalem.net	Telephone: 503-763-3479	
	Mailing Address: 5915 Windsor Island Road N.		
	City: Salem	State: OR	Zip code: 97303

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** ☐ **N0**

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.	City of Aurora	☐ septage ☒ sludge	153,000	☒ gallons ☐ wet tons ☐ dry tons	2.25%
		☐ 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
1.	☒ 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:

$$Dry\ tons = \text{wet tons x \%solids} \qquad Dry\ tons = \frac{(gal\ x\ \%solids\ x\ 8.34)}{100}\ x0.0005$$

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 3153.23	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
[signature]	Wastewater Plant Manager	4/8/2020

Print Name: Jue Zhao

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

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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			
1.	**Please specify quantity (in dry US tons) of finished biosolids stored or produced at your facility.**		
		Class A	**Class B**
	Produced during reporting period		3153.23
	Total biosolids production	0	0
2.	**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		2662.23
	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)		491
	Sent to landfill		
	Other, please specify:		
	Total biosolids disposition (add above lines)	0	3153.23

K. BIOSOLIDS SAMPLING

1. 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

2. Provide details on compliance sampling.

Sample type - Annual - Quarterly - 60 days - Monthly	Class	Processes (select all that apply)	Sampling date: Pollutants	Sampling date: Nutrients
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	1/31/19	1/31/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	2/28/19	2/28/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	3/31/19	3/31/19
Annual	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	4/30/19	4/30/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	5/31/19	5/31/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	6/30/19	6/30/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	7/31/19	7/31/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	8/31/19	8/31/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	9/30/19	9/30/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	10/31/19	10/31/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	11/30/19	11/30/19
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	12/31/19	12/31/19

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)**
Monthly	5.76	1.4	317	19.1	0.6	5.23	12.9	7.59	901
Monthly	5.01	1.34	303	17.5	0.77	5.06	14.0	6.93	815
Monthly	5.53	1.41	295	17.7	0.47	4.8	13.9	7.18	810
Monthly	4.25	1.17	278	20.2	0.71	4.38	12.9	6.45	743
Monthly	4.65	1.28	314	17.5	0.69	4.77	13.9	7.03	881
Monthly	5.19	1.33	314	16.0	0.57	4.7	13.7	6.88	892
Monthly	5.8	1.51	312	15.2	0.02	5.3	13.9	6.0	972
Monthly	5.95	1.48	372	18.3	0.83	5.75	14.0	6.45	1074
Monthly	5.6	1.46	366	17.6	0.03	6.3	16.3	6.55	1129
Monthly	8.35	1.67	415	23.5	0.96	6.68	15.9	11.21	1017
Monthly	9.86	1.62	374	19.7	0.01	5.99	14.1	9.6	1030
Monthly	11.6	1.62	366	17.0	0.01	6.39	13.3	11.19	1052
Annual Mean	6.46	1.44	335	18.26	0.47	5.45	14.1	7.75	943
Table 1[1] Ceiling conc.	75	85	4300	840	57	75	420	100	7500
Table 3[2] Pollutant conc.	41	39	1500	300	17	N/A	420	100	2800

1

[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							
1.	- 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 (%)	F. coli MPN ☐ CFU ☐
	Monthly	57795	2.1	8629	15204	1444	8.14	24.54	
	Monthly	60445		8924	14938	1503	7.97	24.10	
	Monthly	57279		8982	15888	1680	7.99	24.83	
	Monthly	58222	.0	9016	14081	1565	8.73	25.14	
	Monthly	62174	2.0	11229	15171	2085	8.16	20.13	
	Monthly	96110		41901	23971	5118	7.73	14.10	
	Monthly	86573	6.9	43005	17979	4915	7.73	9.47	
	Monthly	87751		39507	18889	4599	7.73	9.5	
	Monthly	83779	14.35	35328	16781	3959	8.02	9.56	
	Monthly	73400		27324	15934	3960	7.91	15.04	
	Monthly	59716	0.0	8187	14364	1519	8.08	25.62	
	Monthly	57683		8295	15026	1455	8.01	25.3	
	Annual Mean	7007	4.22	20860	16519	2808	8.02	18.94	

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.

1.

Class A Alternatives	Class B Alternatives
Biosolids have been tested for (select one or both): ☐ fecal coliform ☐ salmonella	☐ 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 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 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.

1.

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.
- [ ] 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.)

2. **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
Class A	0.00%
Class B	68.30%
	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

1.	**Information DEQ requests with all annual reports:**
	■ 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.
2.	**Information required if pollutants in Section L exceed Table 3 values:**
	☐ Annual and cumulative pollutant additions to land application sites, if any pollutant concentration exceeds the Table 3 values.
3.	**Optional and supplemental information:**
	☐ 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	Title	Date
	Waste Water Treatment Plant Manage	4/8/2020

Print Name: Jue Zhao

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.	Etzel 4A	Etzel	T9S,R2W,Sect17,TL 01800	W.OR Hay	92.98	76.05	33	■ Yes ☐ No	x
2.	Elam (1-F)	Elam	T8S,R2W, Sect.21,TL 501-1401	W.OR Hay	120.59	56.79	19	■ Yes ☐ No	x
3.	Elam (17acre)	Elam	T8S,R2W, Sect.21, TL 501-1401	W. OR Hay	121.29	39.08	13	■ Yes ☐ No	x
4.	Elam Bricker	Elam	T8S,R2W, Sect.22, TL 900	W.OR Hay	124.17	84.38	57	■ Yes ☐ No	x
5.	Elam Cook	Elam	T9S,R2W, Sect.9, TL 600 & 800	W.OR. Hay	76.76	190.26	100	☐ Yes ■ No	x
6.	G. Rouse 1	Rouse	T9S,R2W,Sect.7, TL1300	W.OR Hay	87.26	26.01	25	■ Yes ☐ No	x
7.	G. Rouse 2	Rouse	T9S,R2W,Sect.7, TX 1300	W.OR. Hay	117.73	9.83	7	■ Yes ☐ No	x
8.	G. Rouse 3	Rouse	T9S,R2W,Sect.7,TL 1300	W.OR. Hay	116.92	23.70	17	■ Yes ☐ No	x
9.	G. Rouse 4	Rouse	T9S,R2W,Sect.7, TL 1400	W.OR. Hay	100.07	34.72	14	■ Yes ☐ No	x
10.	G. Rouse 5	Rouse	T9S,R2W,Sect.7, TL 1300	W.OR. Hay	125.19	124.12	40	■ Yes ☐ No	☐
11.	J. Gross 3	Gross	T8S,R2W,Sect.22, TL 00100	P. Rygrass	121.23	85.92	28	■ Yes ☐ No	x
12.	J. Gross 8	Gross	T9S,R2W,Sect.32 TL:#1200	A. Rygrass	107.98	96.35	36	☐ Yes ■ No	x
13.	JGross 8	Gross	T9S,R2W,Sect.32 TL:#1200	A. Rygrass	128.52	118.80	38	☐ Yes ■ No	x
14.	J. Gross 11	Gross	T8S,R2W,Sect.17TL # 00700	P. Rygrass	134.97	307.46	90	■ Yes ☐ No	x
15.	Orton 1	Orton	T8S,R5W,Sect.31&32, 600700,&800	W.OR Hay	115.54	82.65	60	■ Yes ☐ No	x
	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.

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.	Sandau/Mader	Saundau	T7S,R2W,Sect.26, TL2000/2100/230	P. Rygrass	101.93	126.32	50	☐ Yes ■ No	☒
2.	Elam1(22acre)	Elam	T8,R2W,Sect21, TL 0501&1401	W.OR. Hay	107.97	28.32	22	■ Yes ☐ No	☒
3.	Filbin 5	Filbin	T2S, R13E,Sec.26&35, TL 477	E. OR Pasture	83.96	603.12	277	☐ Yes ■ No	☒
4.	Filbin 6	Filbin	T3&2,R13E, Sec.1&36, TL 100&4800	E.OR Pasture	79.0	330.83	161.31	■ Yes ☐ No	☒
5.	Filbin 5	Filbin	T2S, R13E,Sec.26&35, TL 477	E.OR Pasture	53.0	257.48	185.94	☐ 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	Title	Date
	Waste Water treatment Plant Manager	4/8/2020

Print Name: Jue Zhao

Section 5: Tables

Table 1: City of Salem - 2019 Permitted Industries				
Business Name	**Address**	**Standard**	**Category**	**NAICS Description**
Ace Septic Tank Service	10980 Portland Rd NE	40 CFR Part 403	Septic	Septic Tank and Related Services
Angels Toilets Co LLC	368 W Locust ST	40 CFR Part 403	Septic	Septic Tank and Related Services
Bennett Septic Service	38544 S Hardy RD, Molalla	40 CFR Part 403	Septic	Septic Tank and Related Services
Best Pots Inc	100 41st Ave SE, Albany	40 CFR Part 403	Septic	Septic Tank and Related Services
Best Septic, Inc.	110 N Clevland ST, Eugene	40 CFR Part 403	Septic	Septic Tank and Related Services
Better Portable Toilets Inc	1048 Old Salem RD NE, Albany	40 CFR Part 403	Septic	Septic Tank and Related Services
Buck's Sanitary Service	3980 W 12th Ave, Eugene	40 CFR Part 403	Septic	Septic Tank and Related Services
Capital Chrome & Precision Grinding	1520 Hickory St NE	40 CFR Part 413	ZDCM	Electroplating, Plating, Polishing, Anodizing, and Coloring
Capital Recycling & Disposal	1890 16th St. SE	40 CFR Part 413	SIU	Soilid Waste Collection
Carl's Septic LLC	810 Mule Deer ST NW	40 CFR Part 403	Septic	Septic Tank and Related Services
Carl's Septic Tank Cleaning	6329 Stageline Ln SE	40 CFR Part 403	Septic	Septic Tank and Related Services
Clinkscales Portable Toilets	421 W Main St, Molalla	40 CFR Part 403	Septic	Septic Tank and Related Services
Divert Inc	950 SE Jackson ST	40 CFR Part 433	SIU	Resource recovery; environmental sustainability
Ennis-Flint	1675 Commercial St NE	40 CFR Part 433	SIU	Thermoplastic Manufacturing, Paint Production and Glass
Farmers Septic Company	15127 Evans Valley Rd, Silverton	40 CFR Part 403	Septic	Septic Tank and Related Services
Garmin AT Inc	2345 Turner Rd SE	40 CFR Part 433	ZDCM	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
Honest Drain Solutions LLC	23325 S Ward CT, Oregon City	40 CFR Part 403	Septic	Septic Tank and Related Services
Honey Bucket	1685 McGilchrist St SE	40 CFR Part 403	Septic	Septic Tank and Related Services
Hopson Services LLC	40195 N Dogwood RD, Millcity	40 CFR Part 403	Septic	Septic Tank and Related Services
ISA Corporation	3787 Fairview Industrial Dr SE	40 CFR Part 428	SIU	Surgical Appliance and Supplies Manufacturing
JALM LLC	924 Meadow Drive, Molalla	40 CFR Part 403	Septic	Farm and Labor Contractor
Kerr Concentrates Inc	2340 Hyacinth St NE	40 CFR Part 403	SIU	Flavoring Syrup and Concentrate Manufacturing
Kettle Foods Inc	3125 Kettle Ct SE	40 CFR Part 403	SIU	Other Snack Food Manufacturing
LRI Landfill	31317 Neridian E, Graham WA	40 CFR Part 403	SIU	Soilid Waste Landfill
McMinnville Pumping LLC	743 NE 5TH ST	40 CFR Part 403	Septic	Septic Tank and Related Services
Meduri Farms Inc	3985 Portland Rd NE	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
Norpac 8	2325 Madrona Ave SE	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
Northwest Septic Service	Otis, OR	40 CFR Part 403	Septic	Septic Tank and Related Services
Oregon Portable Toilets LLC	10255 Portland Rd NE	40 CFR Part 403	Septic	Septic Tank and Related Services
Oregon Cherry Growers	1520 Woodrow St NE	40 CFR Part 403	SIU	Fruit and Vegetable Canning
Oregon Fruit Products	150 Patterson St NW	40 CFR Part 403	SIU	Fruit and Vegetable Canning
Oregon Sewer and Drain	839 Industrial Way NE, Silverton	40 CFR Part 403	Septic	Septic Tank and Related Services
Oregon State Penitentiary	2605 State St	40 CFR Part 403	SIU	Correctional Institutions
Packaging Corporation of America	2121 Madrona Ave SE	40 CFR Part 403	SIU	Corrugated containers and packaging supplies
REsys Inc	4560 Ridge Dr NE	40 CFR Part 403	SIU	Other Commercial and Service Industry Machinery Manufacturing
RainSweet East Plant	1460 Sunnyview Rd NE	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
RainSweet West Plant	740 Bassett St NW	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
Recology Organics, Aumsville	8712 Aumsville Hwy SE	40 CFR Part 403	SIU	Compost Manufacturing
River City Environmental	5410 NE 109th Ave, Portland	40 CFR Part 403	Septic	Septic Tank and Related Services
Riverbend Landfill Waste Management	13469 SW Hwy 18, McMinnville	40 CFR Part 403	SIU	Solid Waste Landfill
Roto Rooter (Sewer Service) Plumbing & Service Co	2715 19th St SE	40 CFR Part 403	Septic	Septic Tank and Related Services
SAIF Corporation	400 High St. SE	40 CFR Part 403	SIU	Other Commercial and Service Industry Machinery Manufacturing
Salem Health Regional Laboratory	3300 State St	40 CFR Part 403	SIU	Medical Laboratories
Salem Health Patient Care Bldg A	890 Oak St SE	40 CFR Part 403	SIU	General Medical and Surgical Hospitals
SeQuential Pacific Biodiesel	4735 Turner Rd SE	40 CFR Part 403	SIU	Petroleum Refineries
Seneca Foods dba Truitt Family Foods - East	1105 Front St NE	40 CFR Part 403	SIU	Fruit and Vegetable Canning
Seneca Foods Corp./dba Truitt Brothers Inc. WEST	556 Murlark Ave NW	40 CFR Part 403	SIU	Perishable Prepared Food Manufacturing
Valley Landfills Inc Republic Services	28972 Coffin Butte Rd	40 CFR Part 403	SIU	Solid Waste Landfill
Ventura Foods LLC	3371 Portland Rd NE	40 CFR Part 403	SIU	Fats and Oils Refining and Blending
Yamasa Corporation	3500 Fairview Industrial Dr SE	40 CFR Part 403	SIU	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing
Yaquina Bay Fruit Processors LLC	2828 Cherry Ave NE	40 CFR Part 433	SIU	Fruit and Vegetable Canning

Source - cityofsalem.net (Environmental Services-Pretreatment Program page (01/23/2019)

Table 2: 2019 Digester Volatile Feed Pounds

Date	North Digester Feed Vol Lbs	North Digester Feed Vol Lbs - Aurora	South Digester Feed Vol LBS	South Digester Feed Vol Lbs - Aurora	Total Volatile Feed Pounds
Jan-19	466,725	2,448	713,182	3,671	1,186,026
Feb-19	413,837		626,310		1,040,147
Mar-19	494,736	748	760,400	1,122	1,257,007
Apr-19	529,433	1,750	637,387	2,625	1,171,196
May-19	707,404		528,679		1,236,083
Jun-19	642,501	2,394	469,019	3,591	1,117,505
Jul-19	454,451		615,131		1,069,582
Aug-19	443,711	3,979	656,017	5,968	1,109,675
Sep-19	437,244		644,784		1,082,028
Oct-19	480,482	440	728,906	660	1,210,489
Nov-19	436,817	1,771	661,828	2,656	1,103,072
Dec-19	444,013	1,865	666,773	2,798	1,115,449
Total	5,951,354	15,395	7,708,416	23,093	13,698,258
Avg Vol Lbs/Day/Cuft Ratio	**0.064**	**0.00016**	**0.063**	**0.00019**	**0.063**

Source: Hach WIMS - Bioedge Digester Performance Report
Source: Hach WIMS - Aurora Sludge
NPD 1 & 2 = 256,000 cubic feet
SPD 1&2 = 336,000 cubic feet
365 Days/Year

NOTE: In 2018, WLWPCF received solids from the Aurora Wastewater Treatment Plant. Received gallons were fed to the Primary Digesters via automatic valves to achieve split feed flows of 40% and 60% to the North and South Digesters, respectively.

Table 3: 2019 Digester Performance: Monthly and Annual Averages

Date	NPD1 Detention Time (Days)	NPD2 Detention Time (Days)	SPD1 Detention Time (Days)	SPD2 Detention Time (Days)	NPD1 Temp (*F)	NPD2 Temp (*F)	SPD1 Temp (*F)	SPD2 Temp (*F)
Jan-19	49.3	46.0	40.4	43.4	98.4	98.3	98.2	98.4
Feb-19	48.1	47.8	43.0	42.5	98.5	98.4	98.5	98.2
Mar-19	44.6	44.0	39.4	38.4	98.5	98.5	98.3	98.4
Apr-19	42.1	42.1		35.4	97.7	98.2	98.9	98.0
May-19	31.8	31.4		28.6	98.4	98.4	97.7	98.5
Jun-19	34.1	34.7		31.9	98.9	98.6		99.1
Jul-19	50.4	50.2	76.3	45.0	98.9	98.5	98.0	98.6
Aug-19	51.6	52.0	47.2	47.2	98.7	98.0	98.4	98.5
Sep-18	51.2	51.6	46.5	46.0	98.9	98.5	98.4	98.3
Oct-18	50.1	49.8	44.8	44.7	98.5	98.1	98.2	98.1
Nov-18	52.6	51.2	46.2	46.2	98.5	98.3	98.2	98.3
Dec-18	54.3	53.2	48.2	48.4	98.5	98.4	98.4	98.6
Maximum	54.3	53.2	76.3	48.4	98.9	98.6	98.9	99.1
Minimum	31.8	31.4	39.4	28.6	97.7	98.0	97.7	98.0
Average	46.7	46.2	48.0	41.5	98.5	98.3	99.7	98.5

Source: Hach WIMS - BIOEDGE Digester Performance Report

NPD 1 & 2 = 0.9336 MG each

SPD 1 & 2 = 1.2617 MG each

365 Days/Year

Note: This table includes gallons received from the Aurora Wastewater Treatment Plant in 2019 which were fed to the Primary Digesters via automatic valves to achieve split feed flows of 40% and 60% to the North and South Digesters, respectively.

Table 4: 2019 Volatile Solids Reduction: Monthly and Annual Averages

Date	North Digester Feed Vol Lbs - Produced	North Digester Feed Vol Lbs - Received Aurora	South Digester Feed Vol Lbs - Produced	South Digester Feed Vol Lbs - Received Aurora	Biogro Vol Reduction %	BFP Vol Reduction %	CENT Vol Reduction %
Jan-19	466,725	2,448	713,182	3,671			68.9%
Feb-19	413,837		626,310				64.8%
Mar-19	494,736	748	760,400	1,122			67.8%
Apr-19	529,433	1,750	637,387	2,625			64.1%
May-19	707,404		528,679			54.0%	66.4%
Jun-19	642,501	2,394	469,019	3,591	60.9%	64.1%	67.9%
Jul-19	454,451		615,131		63.2%	65.0%	
Aug-19	443,711	3,979	656,017	5,968	65.7%	62.4%	
Sep-19	437,244		655,784		60.2%	55.2%	
Oct-19	480,482	440	728,906	660	71.0%	66.8%	70.2%
Nov-19	436,817	1,771	661,828	2,656		66.9%	73.8%
Dec-19	444,013	1,865	666,773	2,798			70.7%
Total	5,951,354	15,395	7,719,416	23,091			
Maximum	707,404	3,979	760,400	5,968	71.0%	66.9%	73.8%
Minimum	413,837	440	469,019	660	60.2%	54.0%	64.1%
Average	495,946	1,924	643,285	2,886	64.2%	62.0%	68.3%

Source: Hach WIMS - BIOEDGE Digester Performance Report: Monthly & Annual Averages including Aurora Sludge

Source: Hach WIMS - Aurora Sludge

Note: This table includes volatile solids pounds received from the Aurora Wastewater Treatment Plants in 2019. Received pounds of volatile solids were calculated using the plant standard split feed flow of 40% and 60% to the North and South Primary Digesters, respectively.

Table 5a: 2019 Monthly Biosolids Analyses - Centrifuge Dewatered Biosolids

Tests	Units	Method	Month												
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
Total Solids	%	2540B	24.54	24.10	24.83	25.14	24.87	25.76				26.16	25.62	25.30	**25.15**
Volatile Solids	%	2540E	15.92	15.44	15.62	15.74	15.45	15.46				17.29	17.16	17.27	**16.15**
Volatile Reduction	%														**#DIV/0!**
pH	std units	4500H+B	8.14	7.97	7.99	8.73	8.12	8.09				8.13	8.08	8.01	**8.14**
TKN	mg/kg	4500-N-B	57795	60445	57279	58222	61271	55952				57682	59716	57683	**58449**
Ammonia Nitrogen	mg/kg	4500-NH3 B	8629	8924	8982	9016	9291	9850				7832	8187	8295	**8778**
Nitrate Nitrogen	mg/kg	352.1	2.1		32.5		1.4							1.7	**9.4**
Phosphorus	mg/kg	365.3	15204	14938	15888	14081	15802	1624\17				14019	14364	15026	**14915**
Potassium	mg/kg	200.7	1444	1503	1680	1565	1835	1497				1531	1519	1455	**1559**
Arsenic	mg/kg	200.7	5.76	5.01	5.53	4.25	4.60	5.08				7.96	9.86	11.6	**6.63**
Cadmium	mg/kg	200.7	1.40	1.34	1.41	1.17	1.25	1.31				1.63	1.62	1.60	**1.41**
Chromium	mg/kg	200.7	35.6	34.3	33.2	31.2	31.5	27.7				35.7	34.9	34.7	**33.2**
Copper	mg/kg	200.7	317	303	295	278	304	324				413	374	366	**330**
Lead	mg/kg	200.7	19.1	17.5	17.7	20.2	16.9	16.2				18.3	19.7	17.0	**18.1**
Mercury	mg/kg	245.1	0.60	0.77	0.47	0.71	0.57	0.64				1.36	0.01	0.01	**0.57**
Molybdenum	mg/kg	200.7	5.23	5.06	4.80	4.38	4.64	4.59				6.55	5.99	6.39	**5.29**
Nickel	mg/kg	200.7	12.9	14.0	13.9	12.9	14.0	13.7				14.7	14.1	13.3	**13.7**
Selenium	mg/kg	200.7	7.6	6.9	7.2	6.45	7.1	7.1				11.3	9.6	11.2	**8.26**
Silver	mg/kg	200.7	3.45	3.20	3.73	3.94	3.84	3.84				4.48	4.68	5.73	**4.10**
Zinc	mg/kg	200.7	901	815	810	743	879	879				992	1030	1052	**900**

Source: Hach WIMS - Biosolids Annual Summary Report

Table 5b: 2019 Monthly Biosolids Analyses - Belt Filter Press Dewatered Biosolids

Tests	Units	Method	Month												
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
Total Solids	%	2540B					15.38		16.55	16.63	16.64	16.55			**16.35**
Volatile Solids	%	2540E					10.10		10.86	11.43	11.60	11.33			**11.06**
Volatile Reduction	%														**#DIV/0!**
pH	std units	4500H+B					8.20		8.10	8.08	8.70	8.27			**8.27**
TKN	mg/kg	4500-N-B					63076		58615	59704	60796	60146			**60467**
Ammonia Nitrogen	mg/kg	4500-NH3 B					13166		12301	11823	11654	11615			**12112**
Nitrate Nitrogen	mg/kg	352.1					2.5		1.0		2.90				**2.1**
Phosphorus	mg/kg	365.3					14540		14340	14874	13259	14249			**14252**
Potassium	mg/kg	200.7					2334		1934	1827	1720	2067			**1976**
Arsenic	mg/kg	200.7					4.7		6.0	5.90	6.0	9.1			**6.34**
Cadmium	mg/kg	200.7					1.30		1.72	1.56	1.50	1.71			**1.56**
Chromium	mg/kg	200.7					31.2		32.8	36.1	34.9	36.2			**34.2**
Copper	mg/kg	200.7					323		380	398	380	439			**384**
Lead	mg/kg	200.7					18.0		17.8	19.7	17.7	21.4			**18.9**
Mercury	mg/kg	245.1					0.81		0.01	0.99	0.01	0.69			**0.50**
Molybdenum	mg/kg	200.7					4.9		5.50	5.70	6.50	7.00			**5.92**
Nickel	mg/kg	200.7					13.8		14.3	14.4	14.6	15.6			**14.5**
Selenium	mg/kg	200.7					7.0		7.0	7.4	6.7	11.6			**7.9**
Silver	mg/kg	200.7					3.4		5.10	5.80	4.50	4.60			**4.68**
Zinc	mg/kg	200.7					882		1045	1131	1157	1081			**1059**

Source: Hach WIMS - Biosolids Annual Summary Report

Table 5c: 2019 Monthly Biosolids Analyses - Liquid Biosolids

Tests	Units	Method	Month												
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
Total Solids	%	2540B						2.43	2.38	2.36	2.48	2.41			**2.41**
Volatile Solids	%	2540E						1.63	1.52	1.59	1.67	1.61			**1.60**
Volatile Reduction	%														**#DIV/0!**
pH	std units	4500H+B						7.36	7.36	7.37	7.34	7.34			**7.35**
TKN	mg/kg	4500-N-B						136267	114531	115797	106762	102373			**115146**
Ammonia Nitrogen	mg/kg	4500-NH3 B						73952	73708	67190	59002	62525			**67275**
Nitrate Nitrogen	mg/kg	352.1							12.8		25.8				**19.3**
Phosphorus	mg/kg	365.3						23971	21618	22903	20302	19535			**21666**
Potassium	mg/kg	200.7						8739	7895	7371	6198	7983			**7637**
Arsenic	mg/kg	200.7						5.30	5.60	6.00	5.10	8.0			**6.00**
Cadmium	mg/kg	200.7						1.34	1.30	1.40	1.41	1.66			**1.42**
Chromium	mg/kg	200.7						27.4	29.7	32.1	38.4	37.0			**32.9**
Copper	mg/kg	200.7						304	312	345	352	394			**341**
Lead	mg/kg	200.7						15.7	15.2	16.9	17.4	30.7			**19.2**
Mercury	mg/kg	245.1						0.84	0.03	0.67	0.04	0.84			**0.48**
Molybdenum	mg/kg	200.7						4.80	5.10	5.80	6.10	6.50			**5.66**
Nickel	mg/kg	200.7						13.7	13.5	13.5	17.9	17.5			**15.2**
Selenium	mg/kg	200.7						6.7	6.0	5.5	6.40	10.7			**7.1**
Silver	mg/kg	200.7						3.50	4.00	4.80	6.30	4.60			**4.64**
Zinc	mg/kg	200.7						905	898	1016	1101	979			**980**

Source: Hach WIMS - Biosolids Annual Summary Report

Table 6: 2019 Digester Balance: In Versus Out

MONTH	N1 AVG GAL	N2 AVG GAL	AVG DAILY GAL	MONTHLY TOTAL NPD GALLONS	S1 AVG GAL	S2 AVG GAL	AVG DAILY GAL	MONTHLY TOTAL SPD GALLONS	TOTAL - RECEIVED AURORA	COMBINED TOTAL DIG. GALS	TOTAL BIOGRO GAL OUT	TOTAL BFP GAL OUT	TOTAL CENT GAL OUT	TOTAL GALLONS OUT
Jan-19	20,078	20,903	40,981	1,270,400	31,861	30,761	62,622	1,941,298	22,000	3,233,698			3,459,840	3,459,840
Feb-19	19,855	20,014	39,869	1,116,329	29,994	30,331	60,325	1,689,117		2,805,446			2,961,880	2,961,880
Mar-19	21,282	21,526	42,808	1,327,027	32,511	33,239	65,750	2,038,239	12,000	3,377,266			3,565,900	3,565,900
Apr-19	23,683	23,967	47,650	1,429,501	18,762	38,397	57,159	1,714,742	24,000	3,168,243			3,178,070	3,178,070
May-19	30,103	30,350	60,453	1,874,064		45,201	45,201	1,401,228		3,275,292		931,723	3,332,270	4,263,993
Jun-19	27,779	27,425	55,204	1,656,147		40,311	40,311	1,209,316	18,000	2,883,463	1,109,000	55,074	1,494,760	2,658,834
Jul-19	19,062	19,160	38,222	1,184,879	22,751	28,873	51,624	1,600,334		2,785,213	600,000	2,391,555		2,991,555
Aug-19	18,987	18,754	37,741	1,169,991	27,892	27,890	55,782	1,729,241	19,500	2,918,732	372,000	3,317,700		3,689,700
Sep-19	18,791	18,679	37,470	1,124,086	27,956	28,263	56,219	1,686,553		2,810,639	330,000	2,155,052		2,485,052
Oct-19	19,002	19,138	38,140	1,182,331	28,863	29,011	57,874	1,794,080	10,000	2,986,411	132,000	235,511	2,696,060	3,063,571
Nov-19	18,101	18,584	36,685	1,100,546	27,797	27,787	55,584	1,667,511	23,500	2,791,557			2,940,730	2,940,730
Dec-19	17,576	17,888	35,464	1,099,400	26,685	26,587	53,272	1,651,452	24,000	2,774,852	250,000		3,197,710	3,447,710
2019		**MIN**	**35,464**	**1,099,400**		**MIN**	**40,311**	**1,209,316**	**10,000**	**2,774,852**	**132,000**	**55,074**	**1,494,760**	**2,485,052**
		MAX	**60,453**	**1,874,064**		**MAX**	**65,750**	**2,038,239**	**24,000**	**3,377,266**	**1,109,000**	**3,317,700**	**3,565,900**	**4,263,993**
		AVG	**42,557**	**1,294,558**		**AVG**	**55,144**	**1,676,926**	**19,125**	**2,984,234**	**465,500**	**1,514,436**	**2,980,802**	**3,225,570**
			TOTAL	**15,534,701**			**TOTAL**	**20,123,111**	**153,000**	**35,810,812**	**2,793,000**	**9,086,615**	**26,827,220**	**38,706,835**
	% OF TOTAL GALLONS IN			**43.4%**	**% OF TOTAL GALLONS IN**			**56.2%**	**0.4%**	**% OF TOTAL GALLONS OUT**	**7.22%**	**23.48%**	**69.31%**	**100.0%**

Source: Hach WIMS: O-Primary Digester & O-Solids Handling Feeder Sheets
Source: Hach WIMS - Aurora Sludge

TABLE 7: 2019 BIOSOLIDS PRODUCTS PRODUCED						
MONTH	CENT. WET TONS	CENT. DRY TONS	BFP WET TONS	BFP DRY TONS	LIQUID GALLONS	LIQUID DRY TONS
JAN	927.72	227.79				
FEB	397.18	95.72				
MAR	135.60	33.67				
APR	174.21	43.80				
MAY	1,366.28	339.79	411.79	63.33		
JUN	463.10	119.29	48.57	7.16	1,109,000	112.38
JUL		0.00	1,198.94	198.42	600,000	59.55
AUG	1,829.22	512.18	1,594.64	265.19	372,000	36.61
SEP		0.00	576.02	95.85	330,000	34.13
OCT	0.00	0.00	674.66	111.66	132,000	13.27
NOV	60.96	15.62				
DEC	941.29	238.15				
TOTAL	**6,295.56**	**1,626.01**	**4,504.62**	**741.62**	**2,543,000.00**	**255.93**
TOT. DRY TONS	**CENT. DRY TONS**		**BFP DRY TONS**		**LIQUID DRY TONS**	
2,623.56	**1,626.01**		**741.62**		**255.93**	
% OF TOTAL DRY TONS	**61.98%**		**28.27%**		**9.75%**	

2019 Monthly % Total Solids			
MONTH	CENT	BFP	LIQ
JAN	24.55%		
FEB	24.10%		
MAR	24.83%		
APR	25.14%		
MAY	24.87%	15.38%	
JUN	25.76%	14.75%	2.43%
JUL		16.55%	2.38%
AUG	28.00%	16.63%	2.36%
SEP		16.64%	2.48%
OCT	26.16%	16.55%	2.41%
NOV	25.62%		
DEC	25.30%		

Source: Daily Data Entry Spreadsheet

Table 8: 2019 Centrifuge and Belt Filter Press Production

21 Inch Centrifuge

Month	Feed Gal: Million Gals	Total Poly Gal	Poly Cost	Dig Feed: Avg TS %	Avg Poly Lbs Per Dry Ton Feed	Avg Poly Cost Per Dry Ton Feed	Cake: Avg TS %	Average Centrifuge Capture Rate	
Jan-18	3.4598	3163.7	$32,871	2.06%	92.5	$110.09	24.55%	90.80%	
Feb-18	2.9619	2634.6	$27,373	2.05%	90.4	$107.61	24.10%	91.90%	
Mar-18	3.5659	2981.4	$30,977	2.04%	88.0	$104.71	24.83%	90.90%	
Apr-18	3.1781	2663.4	$27,673	2.17%	80.2	$95.41	25.14%	91.20%	
May-18	3.3323	2901.3	$30,144	2.25%	81.1	$96.51	24.87%	90.00%	
Jun-18	1.4948	1408.7700	$14,637	2.1300	96.50	$114.84	25.7600	86.9000	Poly Cost @ $10.39/gal
Jul-18									
Aug-18									
Sep-18									
Oct-18	2.6961	2291.4600	$14,637	2.30%	77.1	$91.75	26.16%	92.30%	
Nov-18	2.9407	2420.7	$25,151	2.23%	77.3	$92.00	25.62%	92.00%	
Dec-18	3.1977	2729.9	$28,364		83.6	$99.48	25.30%	91.40%	
MIN	**1.49**	**1,409**	**$14,637**	**2.04%**	**77.1**	**$91.75**	**24.10%**	**90.00%**	
MAX	**3.57**	**3,164**	**$32,871**	**213.00%**	**96.5**	**$114.84**	**2576.00%**	**8690.00%**	
AVG	**2.98**	**2,577**	**$25,759**	**28.51%**	**85.2**	**$101.38**	**308.51%**	**1046.72%**	
TOTAL	**26.83**	**23,195**	**$231,827**						

Source: OPS SQL: O-Solids Handling & BFP & CENTRIFUGE Polymer Usage & Cost Reports

3 Meter BFP

Month	Total Feed Gal: Million Gals	Total Poly Gal	Poly Cost	Dig Feed: Avg TS %	Avg Poly Lbs Per Dry Ton Feed	Avg Poly Cost Per Dry Ton Feed	Cake: Avg TS %	Average BFP Capture Rate	
Jan-18									
Feb-18									
Mar-18									
Apr-18									
May-18	0.9397	331.0	$3,439	2.26%	32.5	$38.68	15.38%	91.60%	
Jun-18	0.0551	17.8	$185	2.31%	16.2	$19.23	14.75%	91.90%	Poly Cost @ $10.39/gal
Jul-18	2.3916	876.0	$9,102	2.26%	32.5	$38.68	16.55%	90.70%	
Aug-18	3.3177	1097.5	$11,403	2.32%	32.7	$38.90	16.64%	91.30%	
Sep-18	0.4699	673.1	$6,994	2.35%	29.1	$34.58	16.64%	91.90%	
Oct-18	0.0692	77.6	$806	2.31%	30.4	$36.12	16.52%	92.40%	
Nov-18									
Dec-18									
MIN	**0.06**	**18**	**$185**	**2.26%**	**16.2**	**$19.23**	**14.75%**	**90.70%**	
MAX	**3.32**	**1,098**	**$11,403**	**2.35%**	**32.7**	**$38.90**	**16.64%**	**92.40%**	
AVG	**1.21**	**512**	**$5,321**	**2.30%**	**28.9**	**$34.36**	**16.08%**	**91.63%**	
TOTAL	**7.24**	**3,073**	**$31,928**						

Source: OPS SQL: O-Solids Handling & BFP & CENTRIFUGE Polymer Usage & Cost Reports

NOTE: Table 7 utilizes the averaged daily solids concentrations (feed-cake-centrate) for poly cost/dry ton calculations

Centrifuge - K290 FLX @ 264 gal/tote & Belf Filter Press - K144L @ 8.67 lbs/gal

Table 9a: 2019 Site Totals: Application - Storage

Acreage & Biosolids: Totals & Averages Applied	Acres Total	Dry Tons/Acre Average	Dry Tons/Site Total	PAN Lbs/Acre Average	PAN Lbs/Site Total	Phosphorus Lbs/Site Total	Potassium Lbs/Site Total
Liquid Sites	**190**	**1.33**	**254.89**	**111.60**	**21,553.20**	**9,374.11**	**2,960.36**
Dewatered Sites	**1072**	**2.55**	**2,407.34**	**100.69**	**93,502.79**	**71,912.89**	**10,773.67**
Staged Biosolids at Winter Application Acreage							
Remaining Staged (On Site)			491				
Totals & Averages	**1262**	**1.94**	**3153.23**	**106.14**	**115,055.99**	**81,287.00**	**13,734.03**

Table 9b: 2019 Site Totals - Acreage, Tonnage & Nutrient Values of Liquid Biosolids Applied

No.	Liquid Sites	Transport Dates	Use	Acres	Dry Tons Per Acre	Dry Tons Per Site	PAN Lbs Per Acre	PAN Lbs Per Site	Phosphorus Lbs Per Acre	Phosphorus Lbs Per Site	Potassium Lbs Per Acre	Potassium Lbs Per Site	Total Cost Savings Fert-Fuel-Labor
1	G. Rouse 1 (1_P)	06-11-19 to 6-21-19	Western Oregon Hay/Pasture	27	1.04	26.01	87.26	2,356.02	54.06	1,459.64	12.47	336.70	$2,114.56
2	G. Rouse 3 (3_P)	06-11-19 to 6-19-19	Western Oregon Hay/Pasture	17	1.39	23.70	116.92	1,987.64	78.23	1,329.89	18.05	306.77	$1,901.57
3	G. Rouse 2 (2_M)	06-17-19 to 6-18-19	Western Oregon Hay/Pasture	7	1.40	9.83	117.73	824.11	78.77	551.42	18.17	127.20	$788.24
4	D. Elam 1 (1_F)	07-25-19 to 8-19-19	Western Oregon Hay/Pasture	22	1.29	28.32	107.97	2,375.34	72.24	1,589.38	16.67	366.63	$2,279.90
5	Elam-Bricker (1_G)	06-04-19 to 7-25-19	Western Oregon Hay/Pasture	57	1.48	84.38	124.17	7,077.69	83.08	4,735.71	19.17	1,092.42	$6,826.90
6	W. Orton 1 (1_R)	06-14-19 to 10-15-19	Western Oregon Hay/Pasture	60	1.38	82.65	115.54	6,932.40	77.31	4,638.40	12.18	730.64	$6,635.37
			3.07	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Total**
				190	**1.33**	**254.89**	**111.60**	**21,553.20**	**73.95**	**9,374.11**	**16.12**	**2,960.36**	**$20,546.54**

Table 9c: 2019 Site Totals - Acreage, Tonnage & Nutrient Values of Dewatered Biosolids Applied

No.	Dewatered Cake Sites	Transport Dates	Use	Acres	Dry Tons Per Acre	Dry Tons Per Site	PAN Lbs Per Acre	PAN Lbs Per Site	Phosphorus Lbs Per Acre	Phosphorus Lbs Per Site	Potassium Lbs Per Acre	Potassium Lbs Per Site	Total Cost Savings Fert-Fuel-Labor
1	Filbin Field #6 (6_A)	01-01-19 to 03-20-19	Eastern Oregon Pasture	161	2.05	330.05	79.24	12,757.64	61.96	9,975.11	5.66	911.76	$12,755.35
2	Filbin Field #5	04-05-19 to 06-08-19	Eastern Oregon Pasture	277	2.18	603.86	83.96	23,256.92	65.65	18,185.29	4.70	1,302.47	$23,182.31
2	D. Eztel 4A (1_D)	05-21-19 to 06-03-19	Western Oregon Hay/Pasture	33	2.30	75.90	92.98	3,068.34	68.54	2,261.92	84.48	2,787.89	$2,995.16
4	G.Rouse 4 (4_J)	07-23-19 to 07-25-19	Western Oregon Hay/Pasture	14	2.48	34.72	100.07	1,400.98	73.77	1,032.74	9.06	126.88	$1,362.90
5	G. Rouse 5 (5_J)	07-29-19 to 07-31-19	Western Oregon Hay/Pasture	40	3.10	124.00	125.19	5,007.60	92.29	3,691.67	11.34	453.55	$4,828.34
6	D. Elam 1 (17 acre)	08-01-19 to 08-08-19	Western Oregon Hay/Pasture	19	2.99	56.81	120.59	2,291.21	88.90	1,689.07	10.92	207.51	$3,729.60
7	J. Gross 11 (1_H)	08-06-19 to 08-13-19	Perennial Ryegrass	90	3.42	307.80	134.97	12,147.30	102.08	9,187.59	11.62	1,045.37	$11,780.87
8	J. Gross 3 (3_C)	08-14-19 to 08-15-19	Annual Ryegrass	28	3.07	85.96	121.23	3,394.44	91.69	2,567.32	10.43	292.11	$3,304.32
9	J Gross 8 (Cent)	08-15-19 to 08-24-19	Annual Ryegrass	38	3.13	118.94	123.32	4,686.16	93.42	3,550.10	10.63	403.93	$4,566.11
10	J Gross 8(BFP)	08-21-19 to 09-02-19	Eastern Oregon Pasture	36	2.67	96.12	99.59	3,585.24	79.60	2,865.63	36.44	1,311.97	$3,769.41
11	D. Elam /Cook	09-11-19 to 09-16-19	Western Oregon Hay/Pasture	100	1.90	190.00	76.76	7,676.00	56.59	5,658.69	6.95	695.21	$7,645.37
12	Sandau /Mader	10-02-19 to 10-08-19	Perennial Ryegrass	50	2.53	126.50	101.93	5,096.50	75.93	3,796.52	9.23	461.56	$4,953.94
13	Filbin 5	11-25-19 to 12-31-19	Annual Ryegrass	186	1.38	256.68	49.11	9,134.46	40.06	7,451.24	4.16	773.46	$10,908.23
Dewatered Biosolids Sites Totals and Averages				**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Total**
				1072	**2.55**	**2407.34**	**100.69**	**93,502.79**	**76.19**	**71,912.89**	**17.50**	**10,773.67**	**$95,781.91**

Section 6:
Application Site Reports

CITY OF Salem AT YOUR SERVICE
Public Works Department
555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

March 27, 2020

David Elam
Elam Farms Inc.
6802 Ogle Street SE
Salem OR 97317

SUBJECT: **Biosolids Land Application**

Dear Mr. Elam:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2019. This past year there was a total of 197.24 dry tons of Class B biosolids land applied to a total of 109 acres at the sites known as D. Elam 1, Elam-Bricker, and Elam/Cook. The biosolids products you received in 2018 were Biogro™ liquid and Belt Filter Press cake.

Enclosed please find the site and land application worksheets, the daily application maps, the soil monitoring reports, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9, 2019 for average 2019 costs of fertilizer and diesel, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $2.24 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0.51/lb N
  b) Phosphorus (as P_2O_5) 0-52-0 at $540/ton or $0.27/lb: ($0.27/0.52) = $0.52/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $0.24lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using the Biogro™ liquid and Belt Filter Press products in 2019 were as follows:

Transportation and Utility Operations
1410 20th Street SE / Building 2
Salem OR 97302-1209
Phone 503-588-6063
Fax 503-588-6480

Parks Operations
1460 20th Street SE / Building 14
Salem OR 97302-1209
Phone 503-588-6336
Fax 503-588-6305

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road N
Keizer OR 97303-6179
Phone 503-588-6380
Fax 503-588-6387

D. Elam 1(22 acres)	$2279.90
Elam-1 (19 acres)	$3716.60
Elam1(13 acres)	$14951.52
Elam/Bricker	$6,826.90
Elam/Cook	$7645.37
Total:	$21,960.29

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2020 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 Elam Farms Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets—D. Elam 1 and Elam-Bricker
2. Land Application Worksheets—D. Elam 1 and Elam-Bricker
3. Daily Application Maps—D. Elam 1 and Elam-Bricker
4. Soil Monitoring Reports—D. Elam 1 and Elam-Bricker
5. Table of Pollutant Concentrations in Biosolids Products

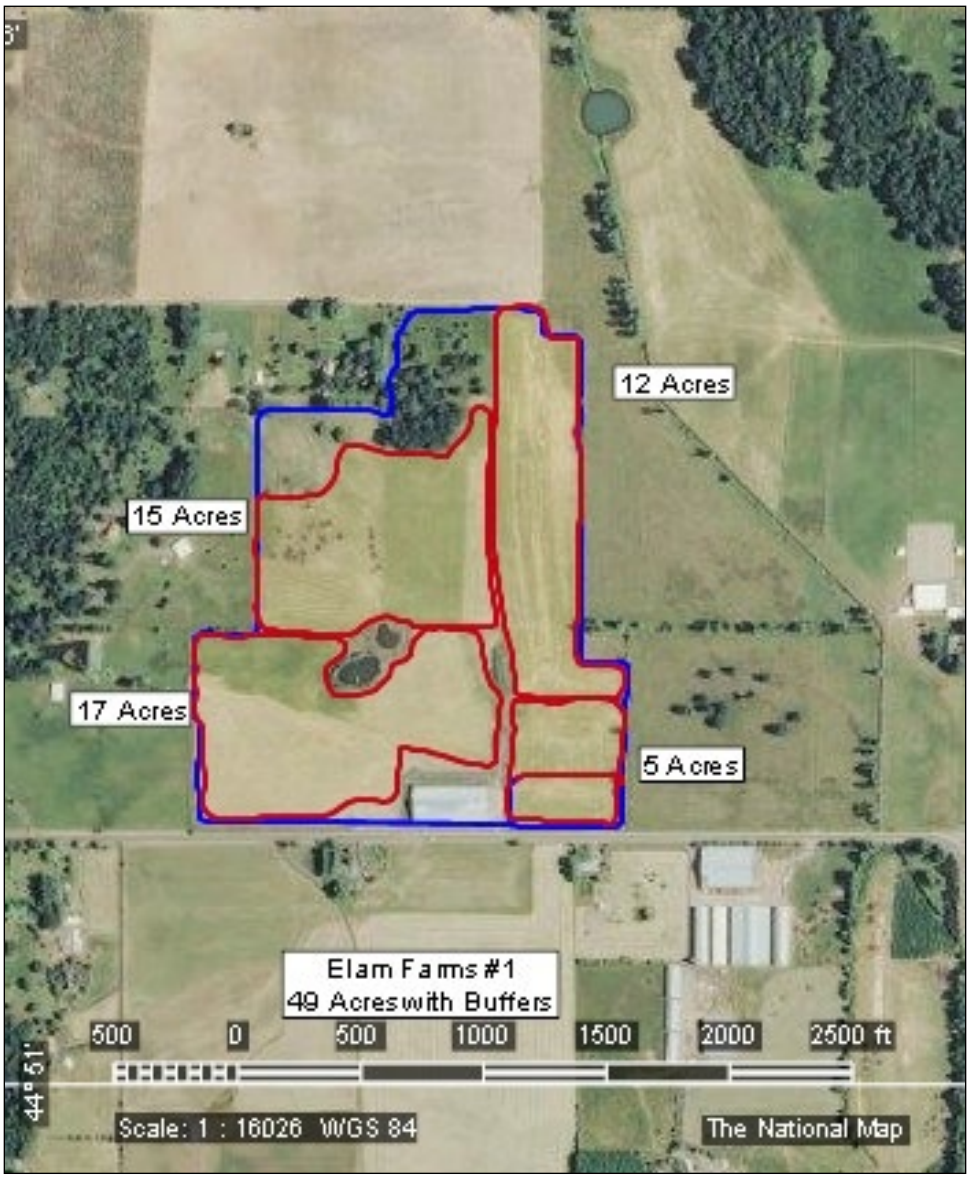
By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2018

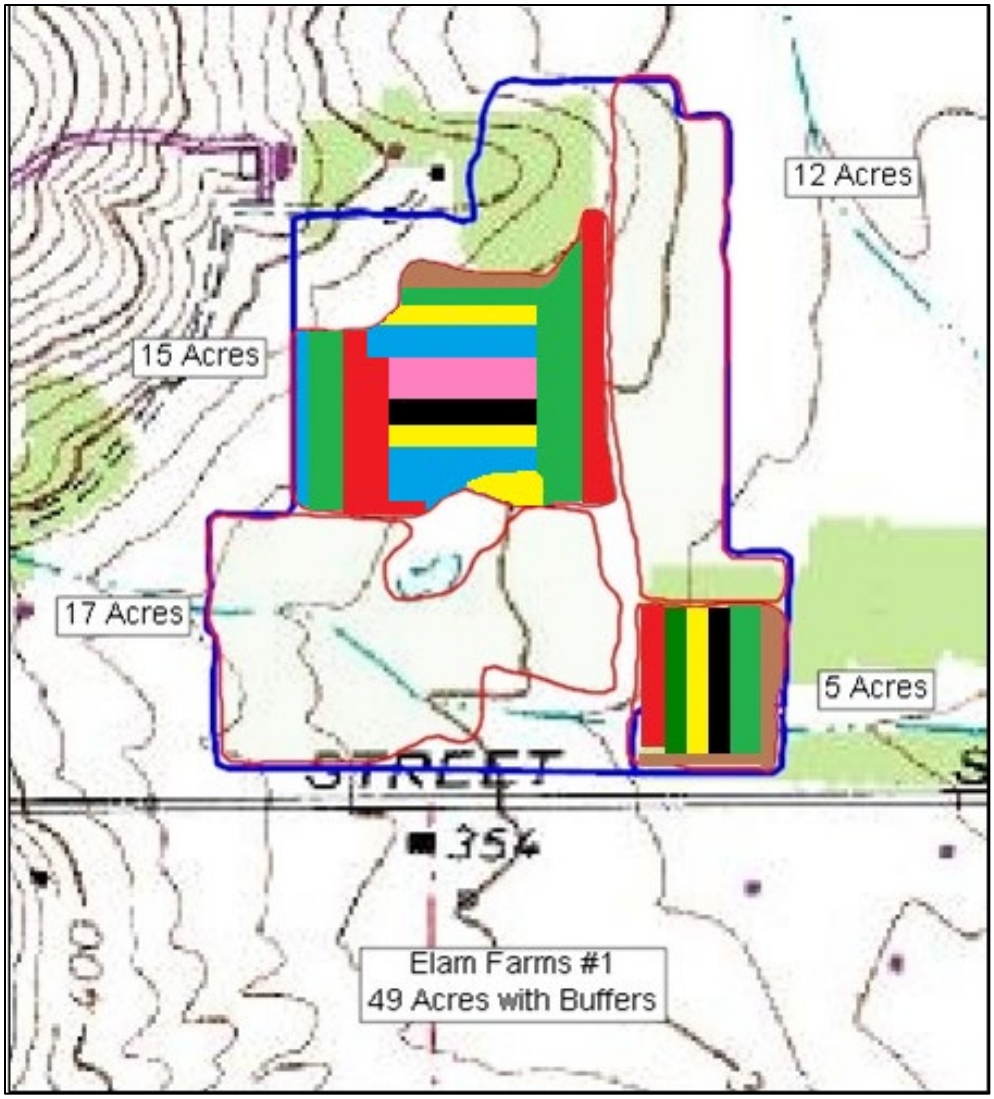
Application Dates: 6-04-2019 to 7-24-2019

Soil Sample Collected:	05-28-19	Domestic Well Sample Collected:	No

Site and Application Identification: D. Elam 1 (1_E) & (1_F) Biosolids Product: Liquid & BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Acreage: 49 Acres, Liquid to 22 acres and BFP Cake to 27 acres
Distance: 20 miles Route To Field: East on Lockhaven, Turn right onto I-5 southbound. Turn east onto Highway 22. Take Joseph Road exit. Turn left onto Aumsville Highway, turn right on Witzel Road, and turn left on Ogle Road. Field is on the left.
Field Input and Recommendations: 200 foot buffer at domestic wells. 50 ft buffer from ditch along Ogle Road and at pond.



2019
ELAM 1
DAILY APPLICATION MAP



Date	Spreader Loads @ approx. 13.96 tons/load	Wet Tons Applied	Acreage	Color
		236.58	12	
		321.0	17	
Total		**557.58**	**29**	

Date	Number of Tankers	Gallons Applied	Color
7/25/19	4	24,000	Red
7/26/19	2	12,000	Dk. Green
7/27/19	1	6,000	Black
7/29/19	2	12,000	Yellow
7/30/19	2	12,000	Blue
7/31/19	5	30,000	Red
8/1/19	8	48,000	Green
8/2/19	2	12,000	Yellow
8/5/19	2	12,000	Blue
8/6/19	4	24,000	Pink
8/7/19	2	12,000	Black
8/12/19	1	6,000	Yellow
8/13/19	3	18,000	Blue
8/14/19	5	30,000	Green
8/15/19	3	18,000	Red
8/16/19	2	12,000	Blue
8/19/19	1	6,000	Yellow
Total	**49**	**294,000**	**--**

D. Elam - 1 17 acre section 1B

FIELD IDENTIFICATION: D. ELAM 1 (1_F)	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 21	
START DATE: 08/1/2019	
STOP DATE: 08/08/2019	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	19

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00
TOTAL WET TONS TO COMPLETE FIELD	342.08
DATE: Field Finished 8/12/19	**343.77**
TOTAL WET TONS REMAINING	(1.69)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	120.59
PAN (TOTAL POUNDS APPLIED)	2,291.25
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,689.07
POTASSIUM (TOTAL POUNDS APPLIED)	207.51
TOTAL WET TONS APPLIED	**343.77**
TOTAL DRY TONS APPLIED	56.79
DRY TONS BIOSOLIDS PER ACRE	2.99
WET TONS BIOSOLIDS PER ACRE	18.09

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

D. Elam - 1 13 acre section1C

FIELD IDENTIFICATION: D. ELAM 1 (1_F)	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 21	
START DATE: 7-25-19	
STOP DATE: 07-30-19	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	13

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00
TOTAL WET TONS TO COMPLETE FIELD	234.06
DATE: Field Finished 7-25-19	**224.44**
TOTAL WET TONS REMAINING	9.62

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	121.29
PAN (TOTAL POUNDS APPLIED)	1,576.82
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,162.41
POTASSIUM (TOTAL POUNDS APPLIED)	142.81
TOTAL WET TONS APPLIED	**236.58**
TOTAL DRY TONS APPLIED	39.08
DRY TONS BIOSOLIDS PER ACRE	3.01
WET TONS BIOSOLIDS PER ACRE	18.20

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

Soil Monitoring Report (0-12inch) - 2019

Site: Dave Elam
Field: Elam /cook

Sample Date: 8/19/2019

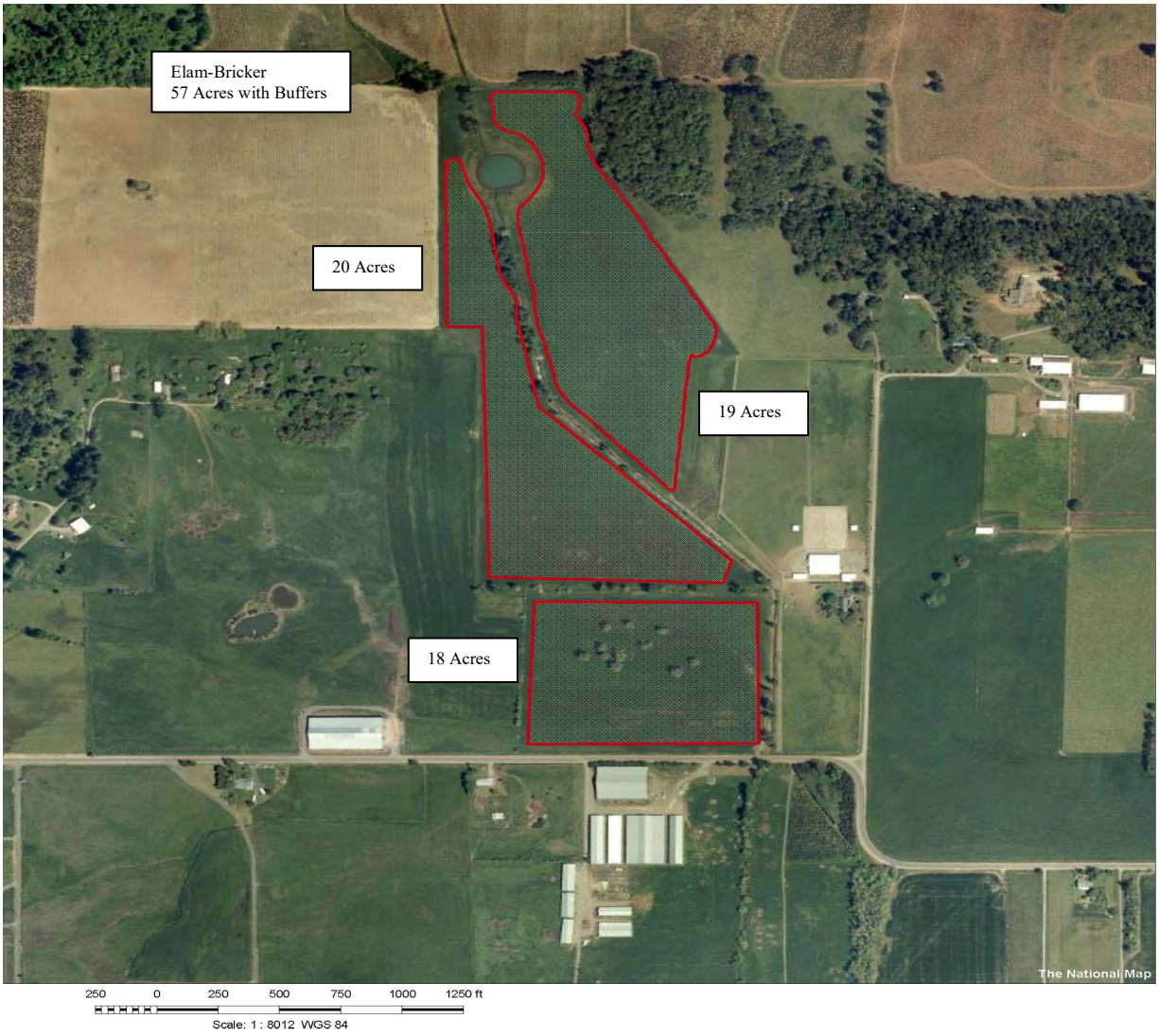
Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	22	mg/kg
Available Phosphorus (P)	16	mg/kg
Total Potassium (K)	67	mg/kg
Sulfate-Sulfur (SO4-S)	9	mg/kg
Organic Matter	3.3	%
pH	5.2	-

APPLICATION SITE WORKSHEET: 2018

Application Dates: 06-04-19 to 07-25-2019

Soil Sample Collected: 05-14-19 Domestic Well Sample Collected: No

Site and Application Identification: **Elam-Bricker (1_G)** Biosolids Product: Liquid & BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre Acreage: Total of 57 acres
Distance: 19 miles Route To Field: East on Lockhaven, South on I-5. Take Kuebler Exit turn east. Turn right on Turner Road. Just past Turner turn left on Witzel Road. Turn left on 70th Ave. There are several ways into field.
Field Input and Recommendations: 200 foot buffer at domestic wells and residences. 50 foot buffer from ditches, roads, and waterways.



2019
ELAM-BRICKER
LIQUID DAILY APPLICATION MAP

Date	Number of Tankers	Gallons Applied	Color
6/4/19	4	24,000	Green
6/5/19	7	42,000	Red
6/6/19	9	54,000	Yellow
6/7/19	3	18,000	Black
6/10/19	7	42,000	Green
6/11/19	2	12,000	Red
6/24/19	6	36,000	Green
6/25/19	9	54,000	Yellow
6/26/19	8	48,000	Red
6/27/19	4	24,000	Blue
6/28/19	3	18,000	Yellow
7/1/19	7	42,000	Blue
7/2/19	4	24,000	Pink
7/3/19	7	42,000	Red
7/4/19	3	18,000	Yellow
7/8/19	2	12,000	Blue
7/9/19	7	42,000	Red
7/10/19	8	48,000	Green
7/11/19	5	30,000	Yellow
7/12/19	2	12,000	Pink
7/16/19	7	42,000	Yellow
7/17/19	7	42,000	Blue

Date	Number of Tankers	Gallons Applied	Color
7/18/19	8	48,000	Red
7/19/19	2	12,000	Yellow
7/22/19	2	12,000	Green
7/23/19	7	42,000	Blue
7/24/19	5	30,000	Green
7/25/19	1	6,000	Red
Total	**25**	**150,000**	**--**

ELAM-BRICKER

FIELD IDENTIFICATION: ELAM-BRICKER (1_G)	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 22	
START DATE: 06-04-2019	
STOP DATE: 07-25-2019	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	57

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600	475

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	517
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	141
DATE: Field Finished 07-25-2019	**146**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	(5)

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	124.17
PAN (TOTAL POUNDS APPLIED)	7,077.76
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,735.71
POTASSIUM (TOTAL POUNDS APPLIED)	1,092.42
TOTAL GALLONS TO FIELD	**876,000**
DRY TONS PER SITE	84.38
DRY TONS PER ACRE	1.48

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.31
ORGANIC NITROGEN (MG/KG)	35,577
INORGANIC NITROGEN (NH4) (MG/KG)	62,531
TKN (MG/KG)	98,108
PHOSPHOURUS (MG/KG)	28,061
POTASSIUM (MG/KG)	6,473
pH	7.45
ARSENIC (MG/KG)	6.82
CADMIUM (MG/KG)	1.52
CHROMIUM (MG/KG)	38.30
COPPER (MG/KG)	45
LEAD (MG/KG)	21.70
MERCURY (MG/KG)	1.18
MOLYBDENUM (MG/KG)	5.74
NICKEL (MG/KG)	15.30
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.3
ZINC (MG/KG)	883
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	21.35
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	62.53
POUNDS OF (P.A.N.)/.DRY TON	83.88

Soil Monitoring Report (0-12inch) - 2019

Site: Dave Elam
Field: D. Elam 1

Sample Date: 5/28/19

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	21	mg/kg
Available Phosphorus (P)	20	mg/kg
Total Potassium (K)	224	mg/kg
Sulfate-Sulfur (SO4-S)	17	mg/kg
Organic Matter	6.2	%
pH	6.1	-

Soil Monitoring Report (0 - 12inch) - 2019

Site: Dave Elam
Field: Elam-Bricker

Sample Date: 5/14/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	9	mg/kg
Available Phosphorus (P)	25	mg/kg
Total Potassium (K)	159	mg/kg
Sulfate-Sulfur (SO4-S)	35	mg/kg
Organic Matter	6.4	%
pH	5.1	-

APPLICATION SITE WORKSHEET: 2014

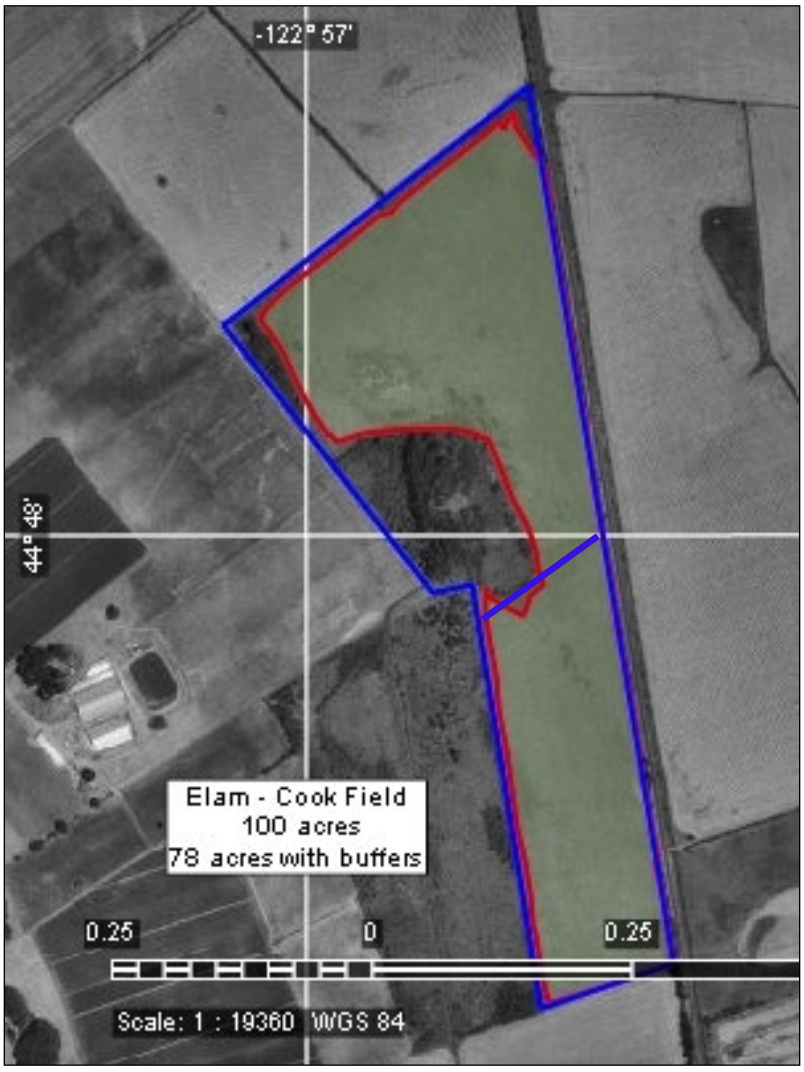
Application Dates: 09-11-19 to 09-16-19

Soil Sample Collected: 08-19-19 Domestic Well Sample Collected: No

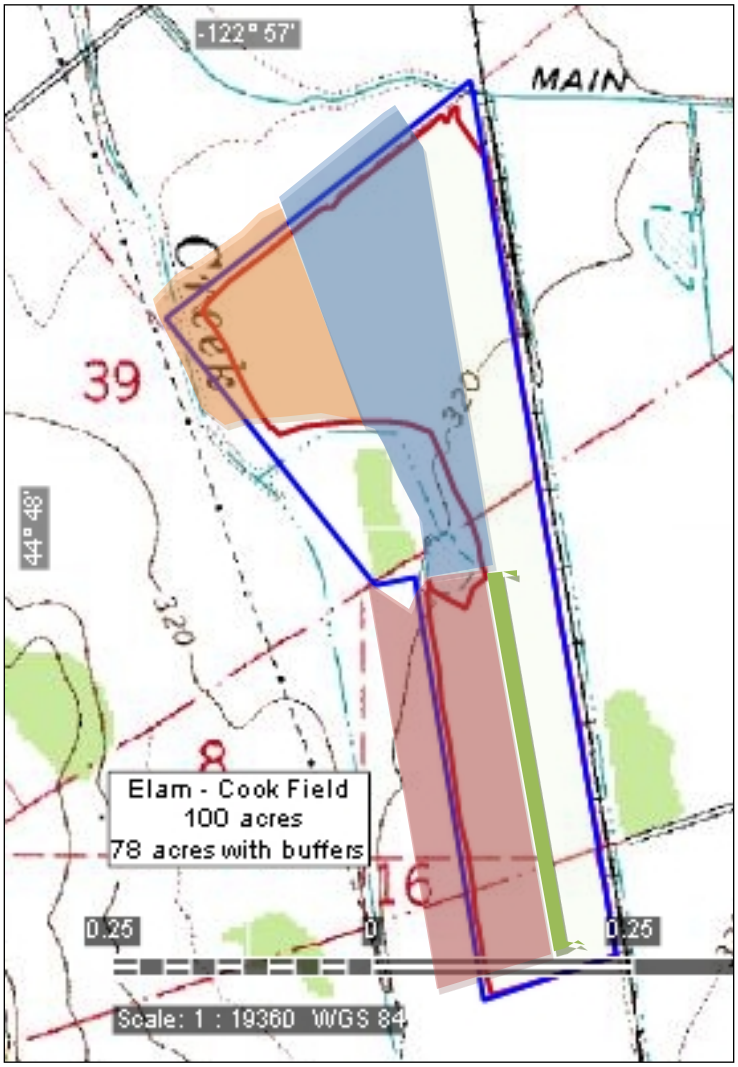
Site and Application Identification: Elam-Cook Field (1_A)
Biosolids Product: BFP Cake
DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture)
Acreage: Total of 78 Acres, BFP cake to 22 acres on North end of field only.

Distance: 4 miles from Irma's Storage
Route To Field:
East on Lockhaven, right onto I-5 southbound. Take Sunnyside/Turner exit off I-5 and head east on Delaney Rd. Take right on Turner Rd. (3rd St.), then left on Denver St. and right on Marian Rd. Just after road veers to southeast, take right on Cook Rd. which becomes Duck Flat Rd. Field is at the end of the road, just over the railroad tracks.

Field Input and Recommendations:
50 foot buffer at roads and ditches. 200 foot buffer at domestic wells and residences.



2019
NJS- ELAM-COOK FIELD
DAILY APPLICATION MAP



Date	Spreader Loads @ 16.221 tons/load	Wet Tons Applied	Color
9/11/19	15	243.315	Orange
9/12/19	22	356.862	Blue
9/13/19	33	535.293	Red
9/16/19	1	16.221	Green
Total	71	1,151.69	

**BFP Cake

D. ELAM 1

FIELD IDENTIFICATION: D. ELAM 1 (1_F) 1A	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 21	
START DATE: 07-25-19	
STOP DATE: 08-19-19	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	22

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600 ft)	475

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	517
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	55
DATE: Field Finished 8-19-19	**49**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	6

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	107.97
PAN (TOTAL POUNDS APPLIED)	2,375.41
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,589.38
POTASSIUM (TOTAL POUNDS APPLIED)	366.63
TOTAL GALLONS TO FIELD	**294,000**
DRY TONS PER SITE	28.32
DRY TONS PER ACRE	1.29

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.31
ORGANIC NITROGEN (MG/KG)	35,577
INORGANIC NITROGEN (NH4) (MG/KG)	62,531
TKN (MG/KG)	98,108
PHOSPHOURUS (MG/KG)	28,061
POTASSIUM (MG/KG)	6,473
pH	7.45
ARSENIC (MG/KG)	6.82
CADMIUM (MG/KG)	1.52
CHROMIUM (MG/KG)	38.30
COPPER (MG/KG)	45
LEAD (MG/KG)	21.70
MERCURY (MG/KG)	1.18
MOLYBDENUM (MG/KG)	5.74
NICKEL (MG/KG)	15.30
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.3
ZINC (MG/KG)	883
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	21.35
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	62.53
POUNDS OF (P.A.N.)/.DRY TON	83.88

D. Elam - Cook

FIELD IDENTIFICATION: D. ELAM Cook Field(1_A)	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T9S RANGE: R2W SECTION: 9	
START DATE: 9/11/19	
STOP DATE: 9/16/19	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	100

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00
TOTAL WET TONS TO COMPLETE FIELD	1,800.43
DATE: Field Finished 9-16-19	**1,151.69**
TOTAL WET TONS REMAINING	648.74

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	76.76
PAN (TOTAL POUNDS APPLIED)	7,676.08
PHOSPHORUS (TOTAL POUNDS APPLIED)	5,658.69
POTASSIUM (TOTAL POUNDS APPLIED)	695.21
TOTAL WET TONS APPLIED	**1,151.69**
TOTAL DRY TONS APPLIED	190.26
DRY TONS BIOSOLIDS PER ACRE	1.90
WET TONS BIOSOLIDS PER ACRE	11.52

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2019

Pollutant Parameter	Biogro™ Liquid	Belt Filter Press (BFP) Cake	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	6	6.34	6.63	41
Cadmium (Cd)	1.42	1.56	1.41	39
Chromium (Cr)	32.9	34.2	33.2	-
Copper (Cu)	341	384	330	1500
Lead (Pb)	19.2	18.9	18.1	300
Mercury (Hg)	0.48	0.5	0.57	17
Molybdenum (Mo)	5.66	5.92	5.29	-
Nickel (Ni)	15.2	14.5	13.7	420
Selenium (Se)	7.1	7.9	8.26	100
Zinc (Zn)	980	1059	900	2800
All units in mg/kg				

CITY OF Salem AT YOUR SERVICE
Public Works Department
555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

March 27, 2020

Jimmy Gross
13384 Jorgenson Road
Jefferson OR 97352

SUBJECT: **Biosolids Land Application**

Dear Mr. Gross:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2019. This past year there was a total of 608.53 dry tons of Class B biosolids land applied to a total of 192 acres at the sites known as J. Gross Fields 3, 8, and 11. The biosolids product you received in 2019 was Centrifuge and Belt filter press cake.

Enclosed please find the site and land application worksheets, the daily application maps, the soil monitoring reports, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9, 2020 for average cost of fertilizer and diesel in 2019, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $2.24 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0.46/lb N
  b) Phosphorus (as P_2O_5) 11-52-0 at $540/ton or $0.27/lb: ($0.27/0.52) = $0.52/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Biosolids Centrifuge and Belt Filter Press Cake product in 2018 were as follows:

J. Gross Field 3	$3769.41
J. Gross Field 8 CEN	$4566.11
J. Gross Field8 BFP	$3769.41
J. Gross Field 11	$11780.87
Total:	$23,420.17

Transportation and Utility Operations
1410 20th Street SE / Building 2
Salem OR 97302-1209
Phone 503-588-6063
Fax 503-588-6480

Parks Operations
1460 20th Street SE / Building 14
Salem OR 97302-1209
Phone 503-588-6336
Fax 503-588-6305

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road N
Keizer OR 97303-6179
Phone 503-588-6380
Fax 503-588-6387

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2020 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 Jensen Farms Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets—J. Gross Fields, 3, 8, and 11
2. Land Application Worksheets— J. Gross Fields 3, 8, and 11
3. Daily Application Maps— J. Gross Fields,3,8 and 11
4. Soil Monitoring Reports— J. Gross Fields, 3,8, and 11
5. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2019

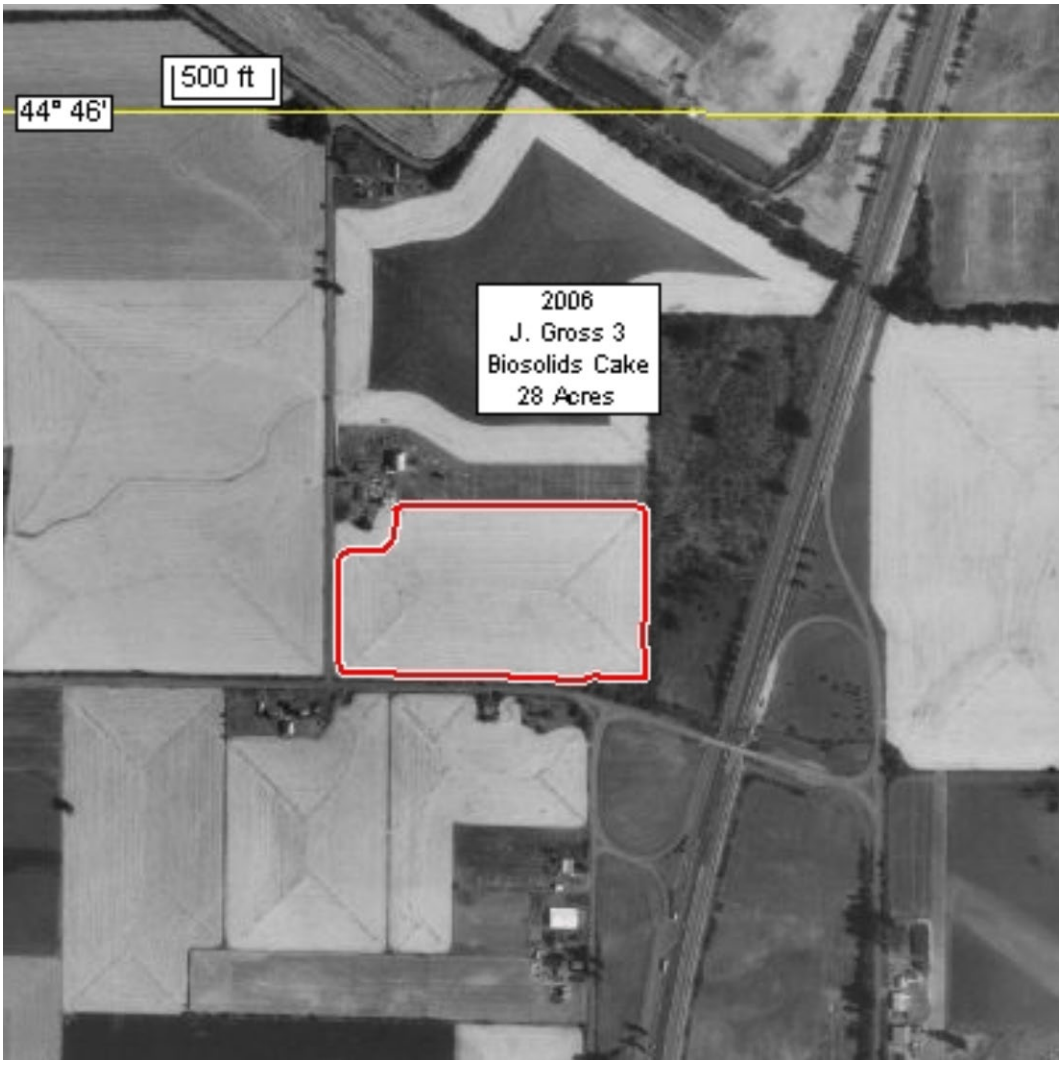
Application Dates:08-14-19 to 08-15-19

Soil Sample Collected: 08-13-19 Domestic Well Sample Collected: NA

Farm & Field Number: J. Gross 3
Biosolids Product: BFP Cake and Liquid Biosolids
DEQ Maximum Nitrogen Application Rate: 120 Pounds per Acre
Acreage: 28 Acres
Distance to Field: 23 miles

Best Route To Field: East on Lockhaven, South on I-5 to Exit 242 (Talbot Rd.). Follow loop around to the stop sign. Turn left on Talbot Road. Turn right on Jorgenson Road. Turn into the Gross Farm Shops, enter field between barn on left and shed on right. Watch the dip at the gate. Drive Slowly.

Field Input and Recommendations:. Buffers: 200 ft at North West corner (for house). 50 foot buffer at roadside ditches.



2019
J. GROSS 3
DAILY APPLICATION MAP

Date	Loads	Wet Tons	Color
8/20/19	21	306.84	Gray
Total	21	**306.84**	

Jimmy Gross - J. Gross Field 3 (CENT)

FIELD IDENTIFICATION: J. GROSS 3 (3_C)	
OWNER: Jimmy Gross	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 22	
START DATE: 08-14-19	
STOP DATE: 08-15-19	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	28

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.85

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.04
TOTAL WET TONS TO COMPLETE FIELD	253.10
DATE: Field Finished 8-20-2019	**306.84**
TOTAL WET TONS REMAINING	(53.74)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	121.23
PAN (TOTAL POUNDS APPLIED)	3,394.45
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,567.32
POTASSIUM (TOTAL POUNDS APPLIED)	292.11
TOTAL WET TONS APPLIED	**306.84**
TOTAL DRY TONS APPLIED	85.92
DRY TONS BIOSOLIDS PER ACRE	3.07
WET TONS BIOSOLIDS PER ACRE	10.96

BIOSOLIDS ANALYSIS INFORMATION	
APR '19 - MAY '19 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)*	28.00
ORGANIC NITROGEN (MG/KG)	50593
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	9154
TKN (MG/KG)	59747
PHOSPHORUS (MG/KG)	14941
POTASSIUM (MG/KG)	1700
pH	8.43
ARSENIC (MG/KG)	4.6
CADMIUM (MG/KG)	1.21
CHROMIUM (MG/KG)	31
COPPER (MG/KG)	291
LEAD (MG/KG)	18.6
MERCURY (MG/KG)	0.64
MOLYBDENUM (MG/KG)	4.51
NICKEL (MG/KG)	13.5
SELENIUM (MG/KG)	6.75
SILVER (MG/KG)	3.9
ZINC (MG/KG)	811
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.36
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	9.15
POUNDS OF (P.A.N.)/.DRY TON	39.51

Soil Monitoring Report - 2019

Site: J. Gross
Field: J. Gross 3

Sample Date: 8/132019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	46	mg/kg
Available Phosphorus (P)	15	mg/kg
Total Potassium (K)	77	mg/kg
Sulfate-Sulfur (SO4-S)	26	3.7
Organic Matter	4	%
pH	4.6	-

APPLICATION SITE WORKSHEET: 2019

Application Dates: 9/3/19

Soil Sample Collected: 8/29/19 Domestic Well Sample Collected: No

Farm & Field Number: J. Gross Field 8 (8_A)
Biosolids Product: BFP, CENT and Liquid Biosolids
DEQ Maximum Nitrogen Application Rate: Ryegrass: 140 lbs per acre
Crop: Annual Ryegrass 74 acres
Acreage: Total 79 acres

Distance to Field: 26.7 miles
Route To Field:
Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 South bound for 15 miles. Take exit 244 towards Jefferson continue onto OR 164 S the take a left onto Winter Creek Rd. Take a right onto Parish Gap Rd then a left onto Jefferson Marion Rd SE. Finally, take a left onto Libby Lane SE and the field is towards the end of the road on the right side.

Field Input and Recommendations:
50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.

Date	Loads	Wet Tons	Color
9/3/19	33	585.23	Orange
Total	33	585.23	

****Belt Press**

APPLICATION SITE WORKSHEET: 2019

Application Dates: 9/2/19

Soil Sample Collected: Domestic Well Sample Collected:

Farm & Field Number: J. Gross Field 8 (8_A) Biosolids Product: BFP, CENT and Liquid Biosolids DEQ Maximum Nitrogen Application Rate: Ryegrass: 140 lbs per acre Crop: Annual Ryegrass 74 acres Acreage: Total 79 acres
Distance to Field: 26.7 miles Route To Field: Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 South bound for 15 miles. Take exit 244 towards Jefferson continue onto OR 164 S the take a left onto Winter Creek Rd. Take a right onto Parish Gap Rd then a left onto Jefferson Marion Rd SE. Finally, take a left onto Libby Lane SE and the field is towards the end of the road on the right side.
Field Input and Recommendations: 50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.

Date	Loads	Wet Tons	Color
9/2/19	23	424.3	Green
Total	23	424.3	

****Centrifuge**

Jimmy Gross - J. Gross Field 8 (CENT)

FIELD IDENTIFICATION: J. GROSS 8	
OWNER: JIMMY GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 32	
START DATE: 08-15-19	
STOP DATE: 08-24-19	
CROP: Perrenial Ryegrass	
TOTAL ACREAGE:	38

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.04

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.04
TOTAL WET TONS TO COMPLETE FIELD	343.50
DATE: Field Finished 8-24-19	**424.30**
TOTAL WET TONS REMAINING	(80.80)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	123.52
PAN (TOTAL POUNDS APPLIED)	4,693.86
PHOSPHORUS (TOTAL POUNDS APPLIED)	3,550.10
POTASSIUM (TOTAL POUNDS APPLIED)	403.93
TOTAL WET TONS APPLIED	**424.30**
TOTAL DRY TONS APPLIED	118.80
DRY TONS BIOSOLIDS PER ACRE	3.13
WET TONS BIOSOLIDS PER ACRE	11.17

BIOSOLIDS ANALYSIS INFORMATION APR '18 - MAY '18 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)*	28.00
ORGANIC NITROGEN (MG/KG)	50593
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	9154
TKN (MG/KG)	59747
PHOSPHORUS (MG/KG)	14941
POTASSIUM (MG/KG)	1700
pH	8.43
ARSENIC (MG/KG)	4.6
CADMIUM (MG/KG)	1.21
CHROMIUM (MG/KG)	31
COPPER (MG/KG)	291
LEAD (MG/KG)	18.6
MERCURY (MG/KG)	0.64
MOLYBDENUM (MG/KG)	4.51
NICKEL (MG/KG)	13.5
SELENIUM (MG/KG)	6.75
SILVER (MG/KG)	3.9
ZINC (MG/KG)	811
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.36
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	9.15
POUNDS OF (P.A.N.)/.DRY TON	39.51

Jimmy Gross - J. Gross Field 8 (BFP)

FIELD IDENTIFICATION: J. GROSS 8	
OWNER: Justin GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 32	
START DATE: 8-21-19	
STOP DATE: 9-02-19	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	36

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.48
WET TONS BIOSOLIDS PER ACRE	15.00

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.48
WET TONS BIOSOLIDS PER ACRE	15.00
TOTAL WET TONS TO COMPLETE FIELD	540.13
DATE: Field Finished 09-02-19	**583.23**
TOTAL WET TONS REMAINING	(43.10)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	107.98
PAN (TOTAL POUNDS APPLIED)	3,887.26
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,865.63
POTASSIUM (TOTAL POUNDS APPLIED)	352.06
TOTAL WET TONS APPLIED	**583.23**
TOTAL DRY TONS APPLIED	96.35
DRY TONS BIOSOLIDS PER ACRE	2.68
WET TONS BIOSOLIDS PER ACRE	16.20

BIOSOLIDS ANALYSIS INFORMATION 2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)*	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

Soil Monitoring Report - 2019

Site: J. Gross
Field: J. Gross 8

Sample Date: 8/29/2019

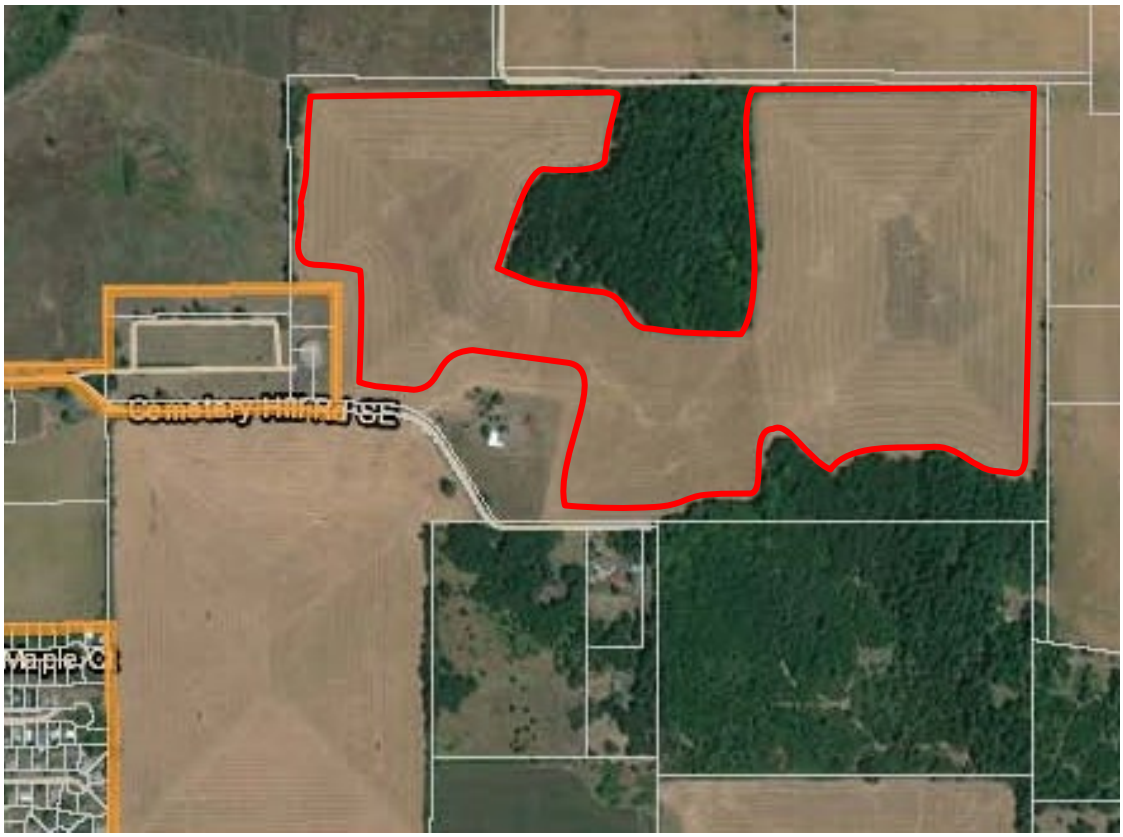
Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	15	mg/kg
Available Phosphorus (P)	31	mg/kg
Total Potassium (K)	115	mg/kg
Sulfate-Sulfur (SO4-S)	14	3.7
Organic Matter	4.5	%
pH	5.3	-

APPLICATION SITE WORKSHEET: 2018

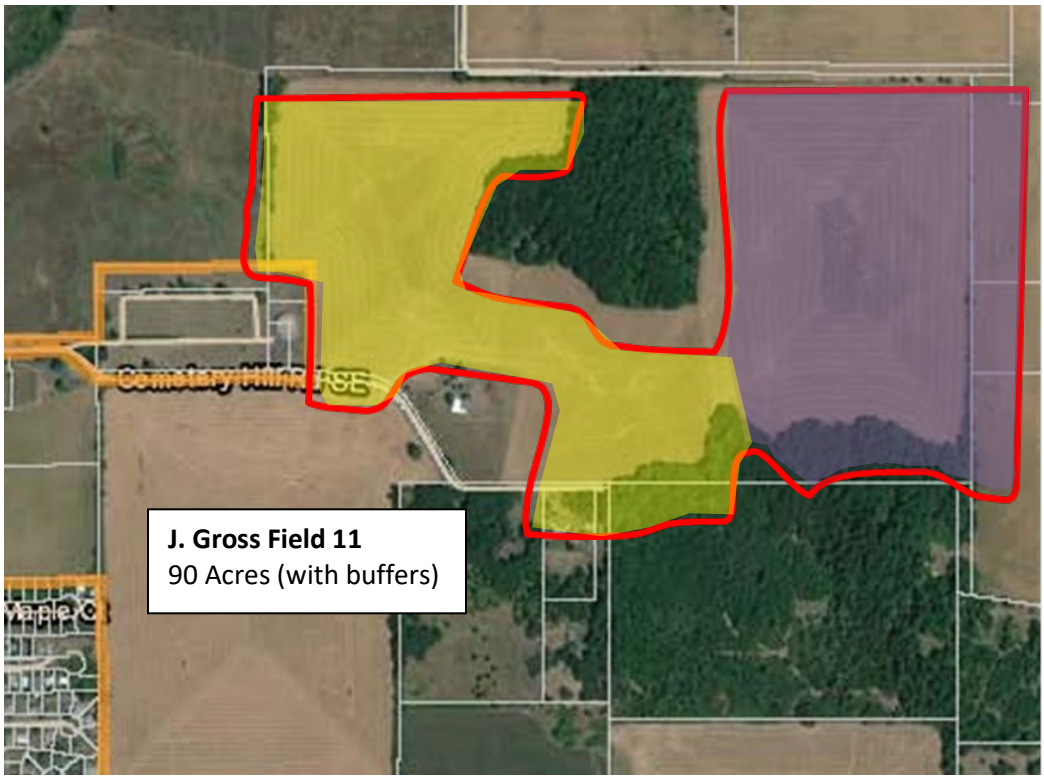
Application Dates: 08-06-19 to 08-17-2019

Soil Sample Collected: 08-06-19 Domestic Well Sample Collected: NA

Farm & Field Number: J. Gross Field 11 (11_A) Biosolids Product: BFP, CENT and Liquid Biosolids DEQ Maximum Nitrogen Application Rate: Perennial Ryegrass 120 lbs per acre Crop: Perennial Ryegrass 95 acres Acreage: Total 90 acres
Distance to Field: 24.3 miles Route To Field: Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 North bound for 14.8 miles. Take exit 244 towards Jefferson, turn left onto OR-164 and continue for 5.3 miles. Turn left onto E North Ave and continue for 0.2 miles then take a right onto Cemetery Hill Rd SE after 0.8 miles you will arrive at the entrance of the field.
Field Input and Recommendations: 50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.



2019 J. Gross Field 11 Daily Application Map



Date	Tons/load @ 13.89974 tons per load	Wet Tons Applied	Color
8/16/19	40	555.9896	Purple
8/17/19	39	542.08986	Yellow
Total	79	1,098.08	

Jimmy Gross - J. Gross Field 11(CENT)

FIELD IDENTIFICATION: J. GROSS 11 (1_H)	
OWNER: JIMMY GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 8-6-19	
STOP DATE: 08-17-19	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	90

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.85

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.85
TOTAL WET TONS TO COMPLETE FIELD	976.26
DATE: Field Finished 8-17-19	**1,098.08**
TOTAL WET TONS REMAINING	(121.82)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	134.97
PAN (TOTAL POUNDS APPLIED)	12,147.62
PHOSPHORUS (TOTAL POUNDS APPLIED)	9,187.59
POTASSIUM (TOTAL POUNDS APPLIED)	1,045.37
TOTAL WET TONS APPLIED	**1,098.08**
TOTAL DRY TONS APPLIED	307.46
DRY TONS BIOSOLIDS PER ACRE	3.42
WET TONS BIOSOLIDS PER ACRE	12.20

BIOSOLIDS ANALYSIS INFORMATION	
APR '18 - MAY '18 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)	28.00
ORGANIC NITROGEN (MG/KG)	50593
INORGANIC NITROGEN (NH4) (MG/KG)	9154
TKN (MG/KG)	59747
PHOSPHORUS (MG/KG)	14941
POTASSIUM (MG/KG)	1700
pH	8.43
ARSENIC (MG/KG)	4.6
CADMIUM (MG/KG)	1.21
CHROMIUM (MG/KG)	31
COPPER (MG/KG)	291
LEAD (MG/KG)	18.6
MERCURY (MG/KG)	0.64
MOLYBDENUM (MG/KG)	4.51
NICKEL (MG/KG)	13.5
SELENIUM (MG/KG)	6.75
SILVER (MG/KG)	3.9
ZINC (MG/KG)	811
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.36
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	9.15
POUNDS OF (P.A.N.)/.DRY TON	39.51

Soil Monitoring Report - 2019

Site: J. Gross
Field: J. Gross 11

Sample Date: 8/6/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	29	mg/kg
Available Phosphorus (P)	18	mg/kg
Total Potassium (K)	50	mg/kg
Sulfate-Sulfur (SO4-S)	14	3.7
Organic Matter	3.6	%
pH	4.9	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2019

Pollutant Parameter	Biogro™ Liquid	Belt Filter Press (BFP) Cake	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	6	6.34	6.63	41
Cadmium (Cd)	1.42	1.56	1.41	39
Chromium (Cr)	32.9	34.2	33.2	-
Copper (Cu)	341	384	330	1500
Lead (Pb)	19.2	18.9	18.1	300
Mercury (Hg)	0.48	0.5	0.57	17
Molybdenum (Mo)	5.66	5.92	5.29	-
Nickel (Ni)	15.2	14.5	13.7	420
Selenium (Se)	7.1	7.9	8.26	100
Zinc (Zn)	980	1059	900	2800
All units in mg/kg				

CITY OF Salem AT YOUR SERVICE
Public Works Department
555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

March 27, 2020

Mike Filbin
Filbin Ranches
61906 Dufur Gap Rd.
Dufur OR 97021

SUBJECT: **Biosolids Land Application**

Dear Mr. Filbin:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2019. This past year there was 1,191.43 dry tons of Class B biosolids land applied to 624 acres at the sites known as Filbin Field #5, and Field #6 (applied both in the spring and fall). The biosolids product you received in 2019 was Centrifuge (CENT) cake.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing that the concentrations of regulated pollutants in the biosolids products generated by the City's Willow Lake Water Pollution Control Facility.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9, 2020, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $2.24 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0.51/lb N
  b) Phosphorus (as P_2O_5) 0-52-0 at $540/ton or $0.52/lb: ($052/0.52) = $0.52/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $0.24lb: ($0.24/0.60) = $0.40lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using the Biosolids Centrifuge Cake product in 2019 were as follows:

Filbin Field 5 (18/19)	$23,182.31
Filbin Field 6 (18/19)	$12,755.35
Filbin Field 5 (Fall '19)	$10,908.23
Total:	$46,845.88

Transportation and Utility Operations
1410 20th Street SE / Building 2
Salem OR 97302-1209
Phone 503-588-6063
Fax 503-588-6480

Parks Operations
1460 20th Street SE / Building 14
Salem OR 97302-1209
Phone 503-588-6336
Fax 503-588-6305

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road N
Keizer OR 97303-6179
Phone 503-588-6380
Fax 503-588-6387

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be staying on contact with you throughout the 2019 winter application season and will contact you when it is time to start hauling again for October. If you have any questions, please feel free to contact me by phone at 503-763-3479 or by email at mstenenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Manager

CMS/SM:X:\040-BIOGRO\ANNUAL REPORTS\2016\SITE APPLICATION\W. ORTON\2016 W. ORTON 1 Biosolids Application Letter.docx

Enclosures:

1. Site Worksheets – Filbin Field 1, #3, #6 and 17/18 Gresham acreage (Now Field 6)
2. Land Application Worksheets – Filbin Field 1, #3, #6 and 17/18 Gresham acreage (Now Field 6)
3. Daily Application Maps – Filbin Field 1, #3, #6 and 17/18 Gresham acreage (Now Field 6)
4. Table of Pollutant Concentrations in Biosolids Products

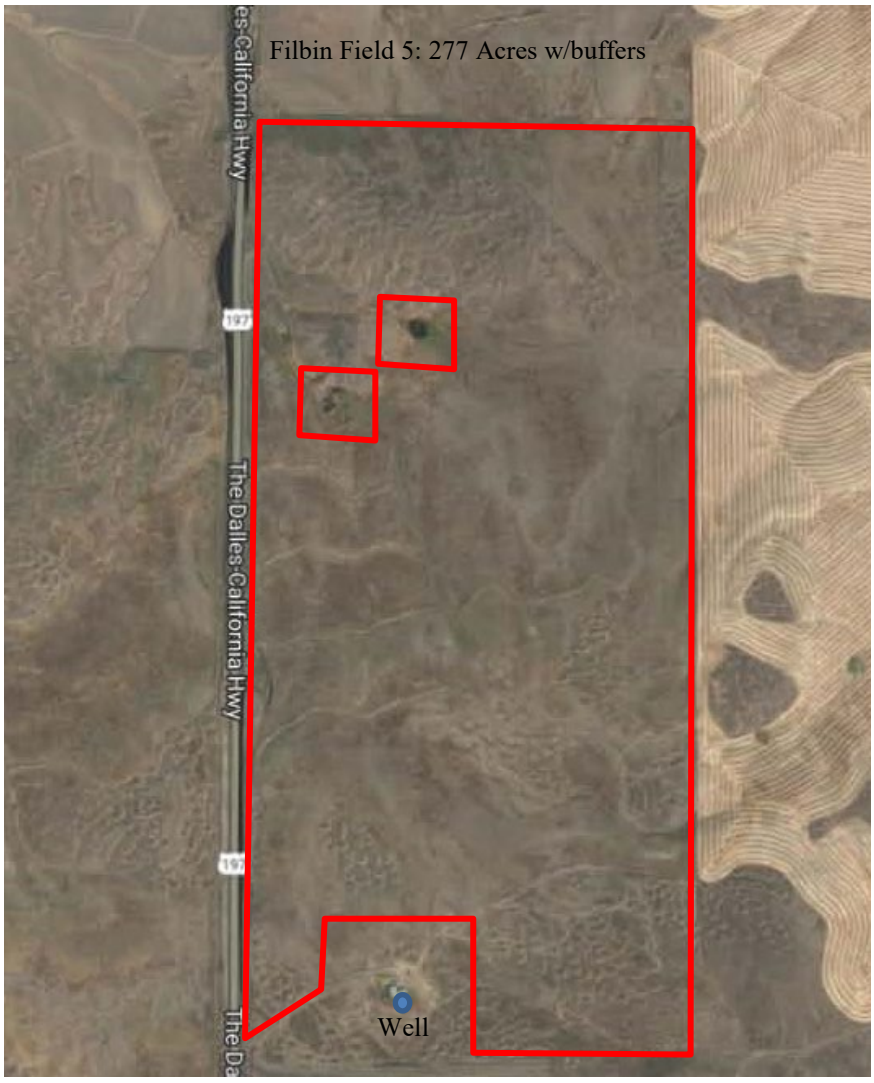
cc: File

2019 APPLICATION SITE WORKSHEET:

Application Dates: 04-2-19 and 11-25-19

Soil Sample Collected: 10/18/19 Domestic Well Sample Collected: NA

Farm & Field Number: Filbin Field 5 (5_A) Biosolids Product: Centrifuge Biosolids Cake DEQ Maximum Nitrogen Application Rate: 100 PAN/Acre; 10.58 wet tons/acre Crop: Eastern Oregon Pasture Acreage: Total for application - 277 acres
Distance to Field: 149 miles Route To Field: Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 North bound for 39 miles. Keep right to stay on I-5 for one mile then take exit 300 to merge onto I-84 towards the Dalles, stay on I-84 for 85 miles and take exit 87 onto US-197 Towards Dufur Bend. Follow US-197 for 21 miles and take right onto Tygh Ridge Road. The field is located on the east side of HWY 197 north of Tygh Ridge Raod. There is a house at the bottom of the field, enter the field through the driveway. The staging area (in case there is a need for storage away from the field due to being inaccessible) is right above Tygh Ridge Rd. at the corner of Tygh Ridge Rd. and Hwy 197.
Field Input and Recommendations: 50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.



2019 Filbin 5 Application Map

Date	Wet Tons	Acres	
4--2-19 – 06-08-19	2415.38	277	
11-25-19 – 12-31-19	1002.25	186	

Mike Filbin - Field #5 2019

FIELD IDENTIFICATION: Filbin Field (5_A)	
MANAGER: Mike Filbin	
LOCATION; TOWNSHIP: T2S RANGE: R13E SECTION: 1 &2	
START DATE: 4-2-19	
STOP DATE: 6-8-19	
CROP: Eastern Oregon Pasture	
TOTAL ACREAGE:	277

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.59
WET TONS BIOSOLIDS PER ACRE	10.39

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	80
DRY TONS BIOSOLIDS PER ACRE	2.07
WET TONS BIOSOLIDS PER ACRE	8.31
TOTAL WET TONS TO COMPLETE FIELD	2,301.45
DATE : As of 2-22-19	**2415.38**
TOTAL WET TONS REMAINING	(113.93)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	83.96
PAN (TOTAL POUNDS APPLIED)	23,257.05
PHOSPHORUS (TOTAL POUNDS APPLIED)	18,185.29
POTASSIUM (TOTAL POUNDS APPLIED)	1,662.20
TOTAL WET TONS APPLIED	**2415.38**
TOTAL DRY TONS APPLIED	603.12
DRY TONS BIOSOLIDS PER ACRE	2.18
WET TONS BIOSOLIDS PER ACRE	8.72

BIOSOLIDS ANALYSIS INFORMATION	
OCT '18 - DEC '18 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)*	24.97
ORGANIC NITROGEN (MG/KG)	51467
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	7681
TKN (MG/KG)	59148
PHOSPHORUS (MG/KG)	15076
POTASSIUM (MG/KG)	1378
pH	8.59
ARSENIC (MG/KG)	6.61
CADMIUM (MG/KG)	1.57
CHROMIUM (MG/KG)	40.23
COPPER (MG/KG)	359
LEAD (MG/KG)	19.97
MERCURY (MG/KG)	0.57
MOLYBDENUM (MG/KG)	6.52
NICKEL (MG/KG)	16.17
SELENIUM (MG/KG)	8.18
SILVER (MG/KG)	3.96
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.88
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	7.68
POUNDS OF (P.A.N.)/.DRY TON	38.56

* weighted average

Mike Filbin - Field #5 2019

FIELD IDENTIFICATION: Filbin Field (5_A)	
MANAGER: Mike Filbin	
LOCATION; TOWNSHIP: T2S RANGE: R13E SECTION: 1 &2	
START DATE: 11-25-19	
STOP DATE: 12-31-19	
CROP: Eastern Oregon Pasture	
TOTAL ACREAGE:	186

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.82
WET TONS BIOSOLIDS PER ACRE	10.97

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	50
DRY TONS BIOSOLIDS PER ACRE	1.41
WET TONS BIOSOLIDS PER ACRE	5.49
TOTAL WET TONS TO COMPLETE FIELD	1,020.39
DATE : As of 12-31-19	**1002.25**
TOTAL WET TONS REMAINING	18.14

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	49.11
PAN (TOTAL POUNDS APPLIED)	9,133.69
PHOSPHORUS (TOTAL POUNDS APPLIED)	7,451.24
POTASSIUM (TOTAL POUNDS APPLIED)	773.46
TOTAL WET TONS APPLIED	**1002.25**
TOTAL DRY TONS APPLIED	257.48
DRY TONS BIOSOLIDS PER ACRE	1.38
WET TONS BIOSOLIDS PER ACRE	5.39

BIOSOLIDS ANALYSIS INFORMATION	
OCT '19- Dec 19 '19 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)*	25.69
ORGANIC NITROGEN (MG/KG)	45516
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8164
TKN (MG/KG)	53680
PHOSPHORUS (MG/KG)	14470
POTASSIUM (MG/KG)	1502
pH	8.07
ARSENIC (MG/KG)	9.80
CADMIUM (MG/KG)	1.62
CHROMIUM (MG/KG)	35.10
COPPER (MG/KG)	384
LEAD (MG/KG)	18.92
MERCURY (MG/KG)	0.46
MOLYBDENUM (MG/KG)	6.31
NICKEL (MG/KG)	14.03
SELENIUM (MG/KG)	10.70
SILVER (MG/KG)	4.96
ZINC (MG/KG)	1025
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	27.31
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.16
POUNDS OF (P.A.N.)/.DRY TON	35.47

* weighted average

2018 APPLICATION SITE WORKSHEET: 2019

Application Dates: 01-01-19 to 03-20-19

Soil Sample Collected: 10-14-19 Domestic Well Sample Collected: NA

Farm & Field Number: Filbin Field 6 (6_A)
Biosolids Product: Centrifuge Biosolids Cake
DEQ Maximum Nitrogen Application Rate: 100 PAN/Acre;
Crop: Eastern Oregon Pasture
Acreage: Total for application - 314 acres

Distance to Field: 149 miles

Route To Field:

Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 North bound for 39 miles. Keep right to stay on I-5 for one mile then take exit 300 to merge onto I-84 towards the Dalles, stay on I-84 for 85 miles and take exit 87 onto US-197 Towards Dufur Bend. Follow US-197 for 21 miles and take right onto Tygh Ridge Road. The field is located on both sides of Hwy197 with the west sections being located south of the rodeo area and the est side across the HWY 197, the staging area is located above Tygh Ridge Rd.(on the east side of HWY 197) after the two sharp curves.

Field Input and Recommendations:

50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.

Filbin 6 Application Map 2019

Date	Wet Tons Applied	Acres	
01-01-19 - 03-21-19	1324.90 Wet Tons	161 acres	

Soil Monitoring Report - 2019

Site: Filbin Ranches
Field: Filbin Field #5

Sample Date: 8/10/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	6	mg/kg
Available Phosphorus (P)	36	mg/kg
Total Potassium (K)	273	mg/kg
Sulfate-Sulfur (SO4-S)	10	mg/kg
Organic Matter	1.4	%
pH	6.4	-

Soil Monitoring Report - 2019

Site: Filbin Ranches
Filbin Field #5

Sample Date: 10/18/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	13	mg/kg
Available Phosphorus (P)	20	mg/kg
Total Potassium (K)	279	mg/kg
Sulfate-Sulfur (SO4-S)	14	mg/kg
Organic Matter	2.3	%
pH	6.4	-

Soil Monitoring Report - 2019

Site: Filbin Ranches
Field: Filbin Field #6

Sample Date: 8/10/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	21	mg/kg
Available Phosphorus (P)	79	mg/kg
Total Potassium (K)	373	mg/kg
Sulfate-Sulfur (SO4-S)	19.8	mg/kg
Organic Matter	1.9	%
pH	6.1	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2019

Pollutant Parameter	Biogro™ Liquid	Belt Filter Press (BFP) Cake	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	6	6.34	6.63	41
Cadmium (Cd)	1.42	1.56	1.41	39
Chromium (Cr)	32.9	34.2	33.2	-
Copper (Cu)	341	384	330	1500
Lead (Pb)	19.2	18.9	18.1	300
Mercury (Hg)	0.48	0.5	0.57	17
Molybdenum (Mo)	5.66	5.92	5.29	-
Nickel (Ni)	15.2	14.5	13.7	420
Selenium (Se)	7.1	7.9	8.26	100
Zinc (Zn)	980	1059	900	2800
All units in mg/kg				

CITY OF Salem AT YOUR SERVICE
Public Works Department
555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

March 27, 2020

David Etzel
Etzel Farms
PO Box 741
Turner OR 97392

SUBJECT: **Biosolids Land Application**

Dear Mr. Etzel:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2019. This past year there was 76.05 dry tons of Class B biosolids land applied to 33 acres at the site known as Etzel 4A. The biosolids product you received in 2019 was Belt Filter Press cake.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9, 2020 for average cost of 2019 fertilizer and diesel, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $2.19 per gallon and a usage rate of four gallons per hour.
- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0.51/lb N
  b) Phosphorus (as P_2O_5)11-52-0 at $540/ton or $0.27/lb: ($0.27/0.52) = $0.52/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $024/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Belt Filter Press cake products in 2019 were $2,995.16.

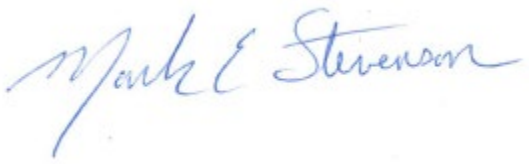
Transportation and Utility Operations
1410 20th Street SE / Building 2
Salem OR 97302-1209
Phone 503-588-6063
Fax 503-588-6480

Parks Operations
1460 20th Street SE / Building 14
Salem OR 97302-1209
Phone 503-588-6336
Fax 503-588-6305

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road N
Keizer OR 97303-6179
Phone 503-588-6380
Fax 503-588-6387

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2019 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,



Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 W Orton 1 Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheet
2. Land Application Worksheets
3. Daily Application Map
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

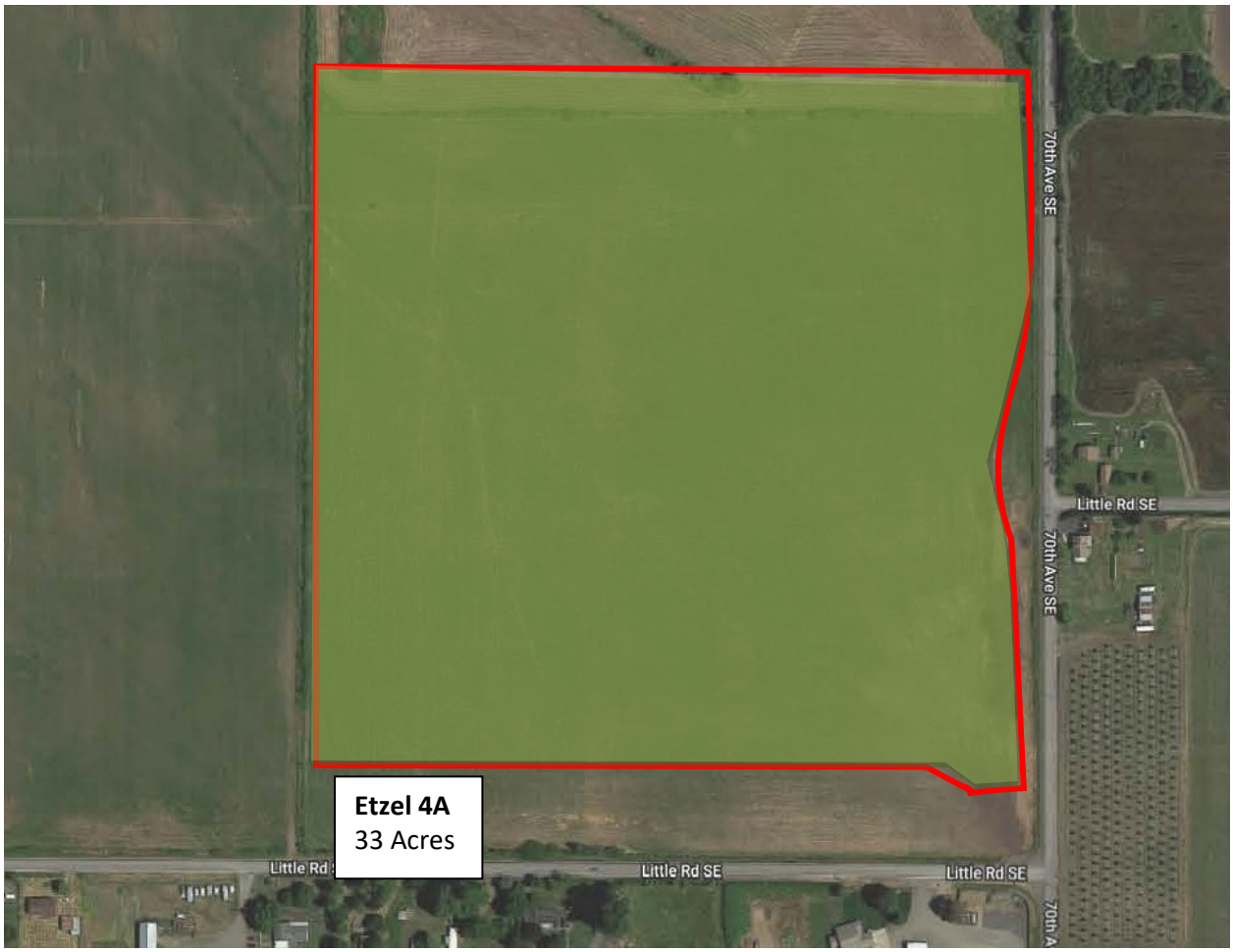
APPLICATION SITE WORKSHEET: 2018

Application Dates: 05-21-19 to 06-03-19

Soil Sample Collected:	05-14-19	Domestic Well Sample Collected:	No

Site and Application Identification: Etzel 4A Biosolids Product: Liquid and Belt Filter Press Cake DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre Acreage: 33 Acres
Distance: 18 miles Route To Field: I-5 South to Kuebler Exit. Right on Turner Road, south through Turner. South on Marion Road. Left on Little and Right into Etzel 4A.
Field Input and Recommendations: 50 ft buffer from ditch. 200 foot buffer at dwellings and domestic wells.

2018 Etzel Field 4A Daily Application Map



Date	Tons/load @16.4716tons per load	Wet Tons Applied	Color
6/21/19	25	460.36	Green
Total	25	460.36	

Etzel Farms - Etzel 4A

FIELD IDENTIFICATION: Etzel 4A (1_D)	
OWNER: Dave Etzel	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 5-21-19	
STOP DATE: 6-3-19	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	33

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.48
WET TONS BIOSOLIDS PER ACRE	15.00

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.48
WET TONS BIOSOLIDS PER ACRE	15.00
TOTAL WET TONS TO COMPLETE FIELD	495.12
DATE: As of June 21, 2019	**460.36**
TOTAL WET TONS REMAINING	34.76

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	92.98
PAN (TOTAL POUNDS APPLIED)	3,068.33
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,261.92
POTASSIUM (TOTAL POUNDS APPLIED)	277.89
TOTAL WET TONS APPLIED	**460.36**
TOTAL DRY TONS APPLIED	76.05
DRY TONS BIOSOLIDS PER ACRE	2.30
WET TONS BIOSOLIDS PER ACRE	13.95

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

Soil Monitoring Report - 2019

Site: Dave Etzel
Field: Etxel 4A

Sample Date: 5/14/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	28	mg/kg
Available Phosphorus (P)	103	mg/kg
Total Potassium (K)	358	mg/kg
Sulfate-Sulfur (SO4-S)	17	mg/kg
Organic Matter	6.5	%
pH	6.7	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2019

Pollutant Parameter	Biogro™ Liquid	Belt Filter Press (BFP) Cake	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	6	6.34	6.63	41
Cadmium (Cd)	1.42	1.56	1.41	39
Chromium (Cr)	32.9	34.2	33.2	-
Copper (Cu)	341	384	330	1500
Lead (Pb)	19.2	18.9	18.1	300
Mercury (Hg)	0.48	0.5	0.57	17
Molybdenum (Mo)	5.66	5.92	5.29	-
Nickel (Ni)	15.2	14.5	13.7	420
Selenium (Se)	7.1	7.9	8.26	100
Zinc (Zn)	980	1059	900	2800
All units in mg/kg				

CITY OF Salem AT YOUR SERVICE
Public Works Department
555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

March 27, 2020

Dan Sandau
Sandau Enterprises
775 78th Ave. NE
Salem OR 97301

SUBJECT: **Biosolids Land Application**

Dear Mr. Sandau:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2019. This past year there was 105.32 dry tons of Class B biosolids land applied to 50 acres at the site known as Sandau/Mader1. The biosolids product you received in 2019 was Belt Filter Press cake.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9, 2020 with an average cost of fuel and fertilizer for 2019 and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $2.24 per gallon and a usage rate of four gallons per hour.

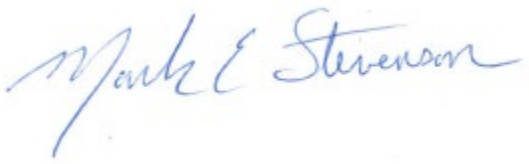
- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0..51/lb N
  b) Phosphorus (as P_2O_5) 11-52-0 at $540/ton or $0..271/lb: ($0.27/0.52 = $0.52/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Belt Filter Press cake products in 2019 were $4,953.94.

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2019 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net

Sincerely,



Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 W Orton 1 Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheet
2. Land Application Worksheets
3. Daily Application Map
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2006

Application Dates: 10/02/19 to 10/08/19

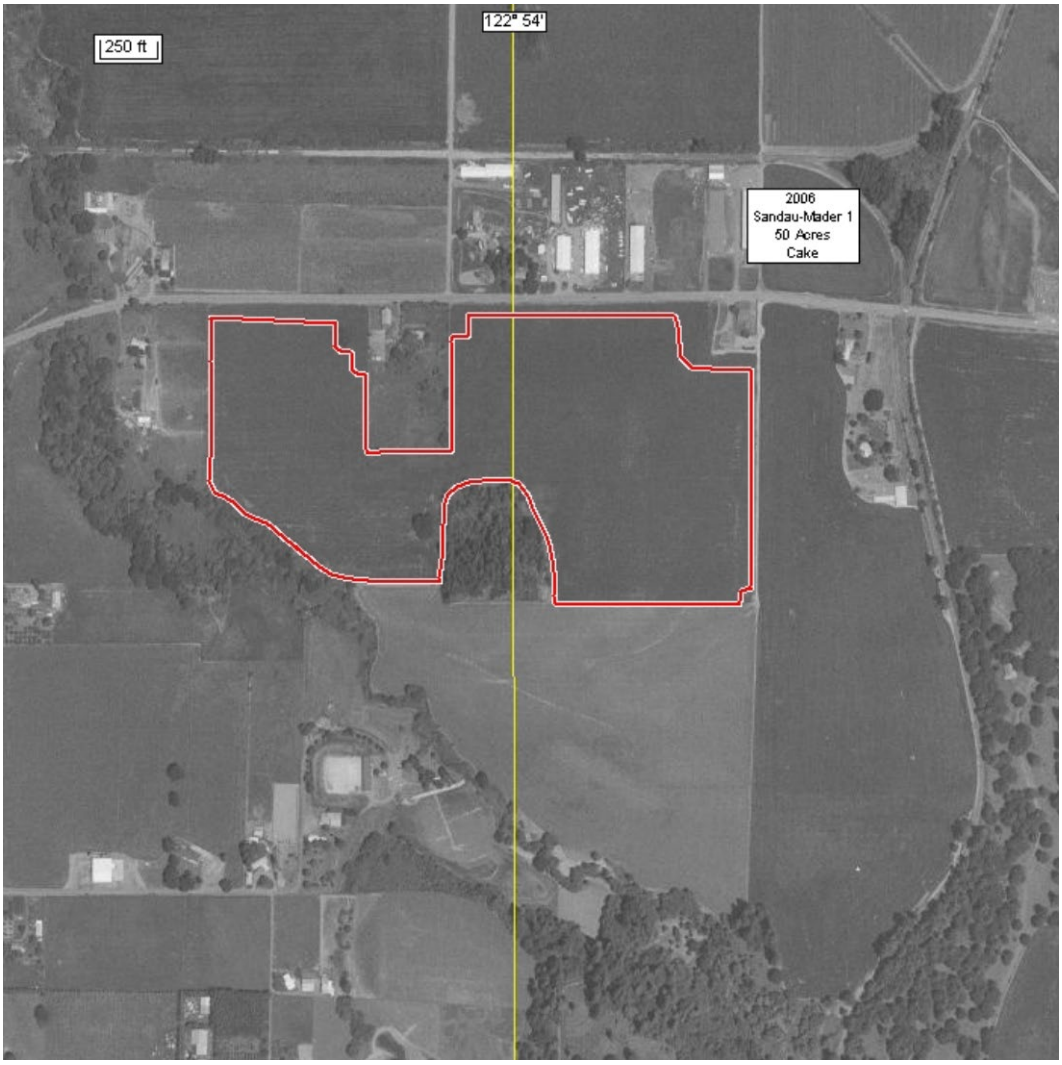
Soil Sample Collected: 09-29-19 Domestic Well Sample Collected: N/A

Farm & Field Number: Sandau-Mader 1
Biosolids Product: Cake
DEQ PAN Application Rate: 140 PAN/ACRE
Acreage: 50
Distance to Field: 14 MILES

Best Route To Field: East on Lockhaven, South on Cordon Road. East on State Street. Field is on the right. Entrance is just beyond where 78th Avenue T's into State Street. Another entrance is at driveway to house at NE corner of site. Use different routes across field to avoid compaction.

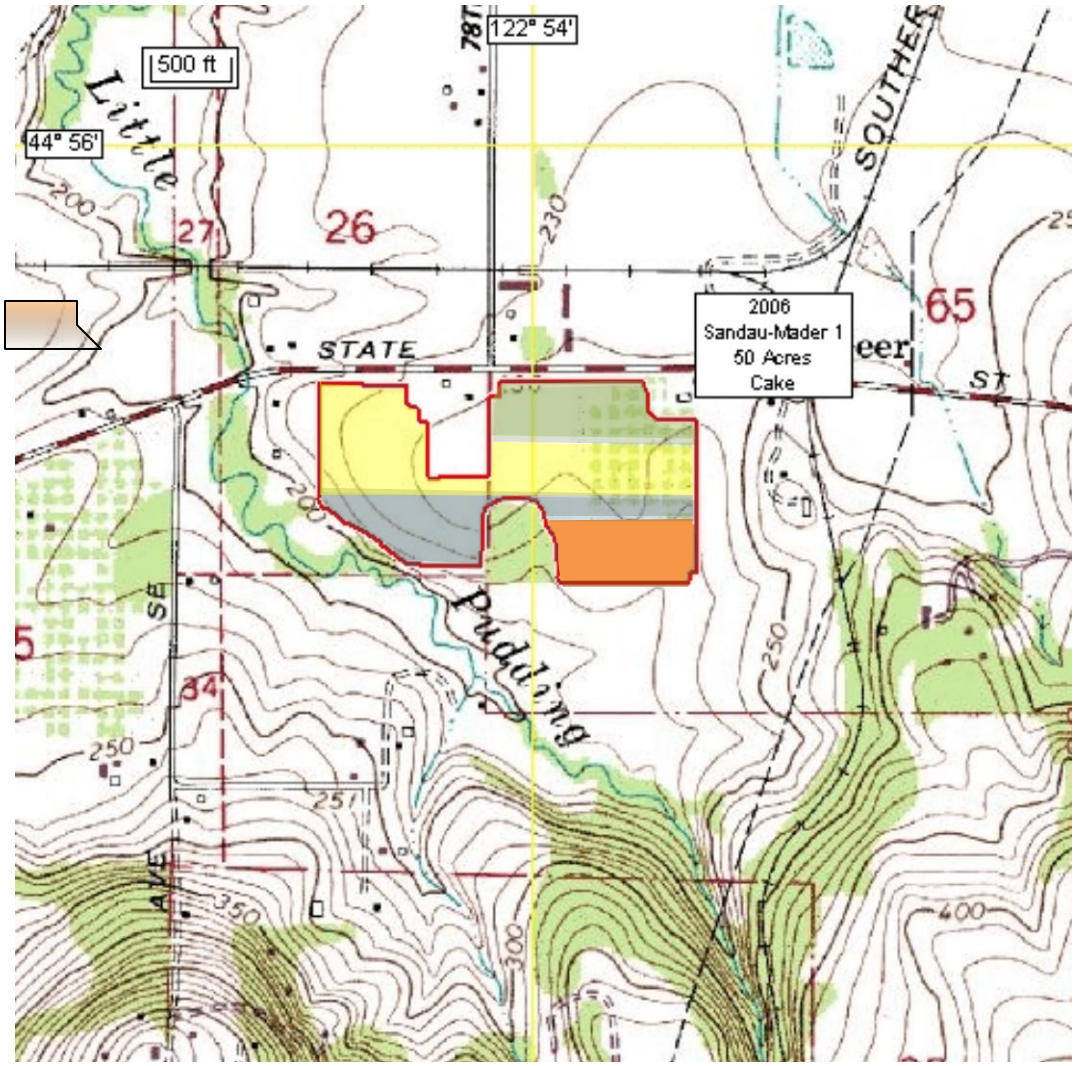
Field Input and Recommendations: Buffer Zones: 50 Feet from State Street, ditches or water ways. 200 feet from domestic wells and dwellings. 75 feet from irrigation well. 10 feet from other farm field property lines.

Comments: Buffer zones at house in central field location and NE corner. Irrigation well in SE corner.



2019
SANDAU-MADER 1
DAILY APPLICATION MAP

764.63



Date	Number Of Spreader Loads @ 12.747 tons/load	Wet Tons Applied	Color
10/2/19	10	127.47	Orange
10/3/19	15	191.205	Grey
10/7/19	20	254.94	Yellow
10/8/19	15	191.205	Green
Total	60	764.82	

D. Sandau /Mader

FIELD IDENTIFICATION: D. Sandau /Mader 1	
OWNER:	
LOCATION; TOWNSHIP: T7S RANGE: R2W SECTION: 26	
START DATE: 10-2-19	
STOP DATE: 010-8-19	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	50

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE	140
DRY TONS BIOSOLIDS PER ACRE	3.47
WET TONS BIOSOLIDS PER ACRE	21.01

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00
TOTAL WET TONS TO COMPLETE FIELD	900.22
DATE: Field Finished 8-27-18	**631.78**
TOTAL WET TONS REMAINING	268.44

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	101.93
PAN (TOTAL POUNDS APPLIED)	5,096.30
PHOSPHORUS (TOTAL POUNDS APPLIED)	3,756.92
POTASSIUM (TOTAL POUNDS APPLIED)	461.56
TOTAL WET TONS APPLIED	**764.63**
TOTAL DRY TONS APPLIED	126.32
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	15.29

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

Soil Monitoring Report - 2019

Site: Dan Sandau
Field: D. Sandau 1

Sample Date: 9/25/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	23	mg/kg
Available Phosphorus (P)	123	mg/kg
Total Potassium (K)	165	mg/kg
Sulfate-Sulfur (SO4-S)	10	mg/kg
Organic Matter	4.1	%
pH	5.4	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2019

Pollutant Parameter	Biogro™ Liquid	Belt Filter Press (BFP) Cake	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	6	6.34	6.63	41
Cadmium (Cd)	1.42	1.56	1.41	39
Chromium (Cr)	32.9	34.2	33.2	-
Copper (Cu)	341	384	330	1500
Lead (Pb)	19.2	18.9	18.1	300
Mercury (Hg)	0.48	0.5	0.57	17
Molybdenum (Mo)	5.66	5.92	5.29	-
Nickel (Ni)	15.2	14.5	13.7	420
Selenium (Se)	7.1	7.9	8.26	100
Zinc (Zn)	980	1059	900	2800
All units in mg/kg				

CITY OF Salem AT YOUR SERVICE
Public Works Department
555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

March 27, 2020

Wayne Orton
Orton Farms
6765 Talmadge Road
Independence OR 97351

SUBJECT: **Biosolids Land Application**

Dear Mr. Orton:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2019. This past year there was 82.65 dry tons of Class B biosolids land applied to 60 acres at the site known as W. Orton 1. The biosolids product you received in 2019 was Liquid Biosolids.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9, 2020 for average 2019 costs of fertilizer and diesel, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $2.24 per gallon and a usage rate of four gallons per hour.

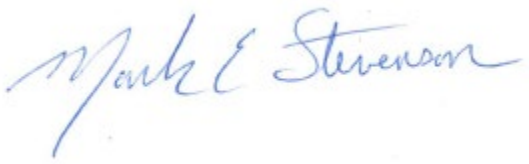
- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0.51/lb N
  b) Phosphorus (as P_2O_5) 11-52-0 at $540/ton or $0.27/lb: ($0.27/0.52) = $052/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Belt Filter Press cake products in 2018 were $6,635.37.

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2019 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,



Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 W Orton 1 Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheet
2. Land Application Worksheets
3. Daily Application Map
4. Table of Pollutant Concentrations in Biosolids Products

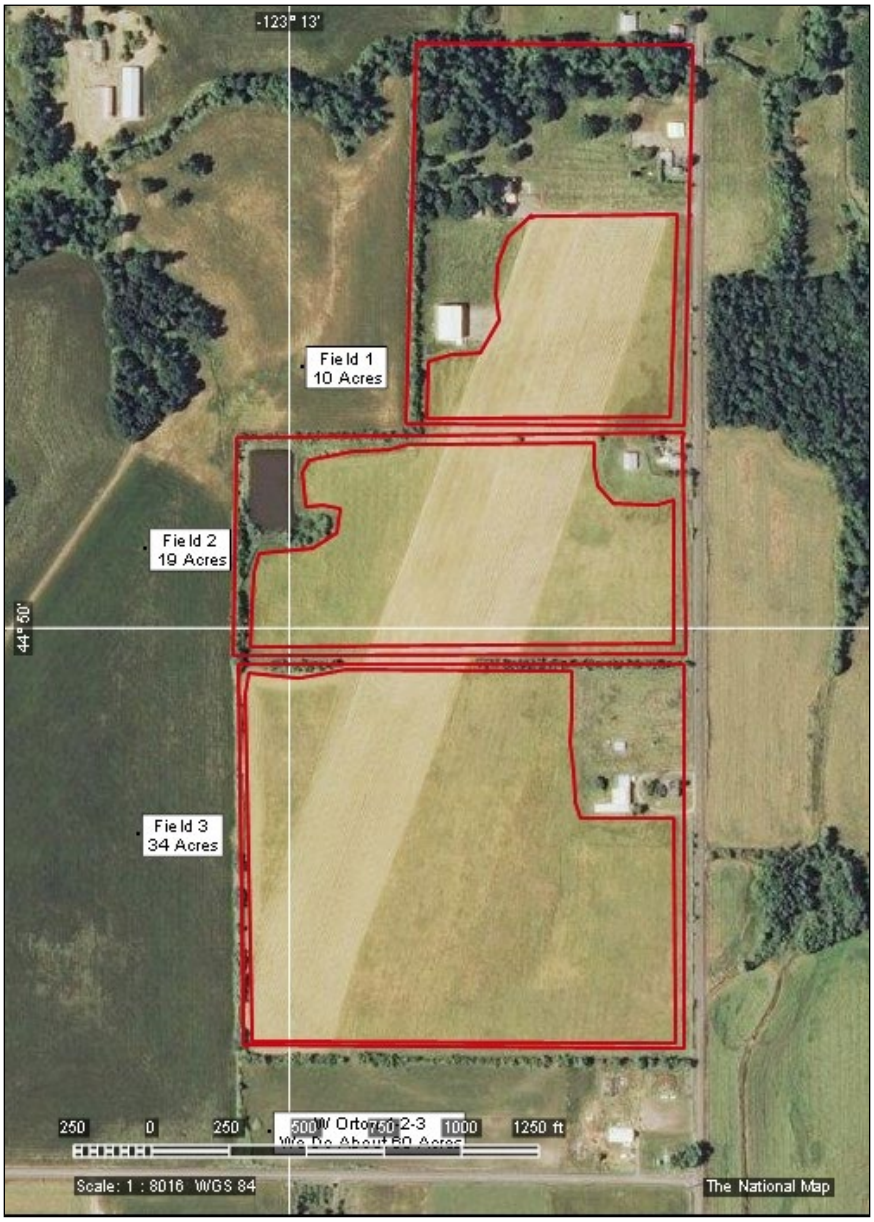
By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2018

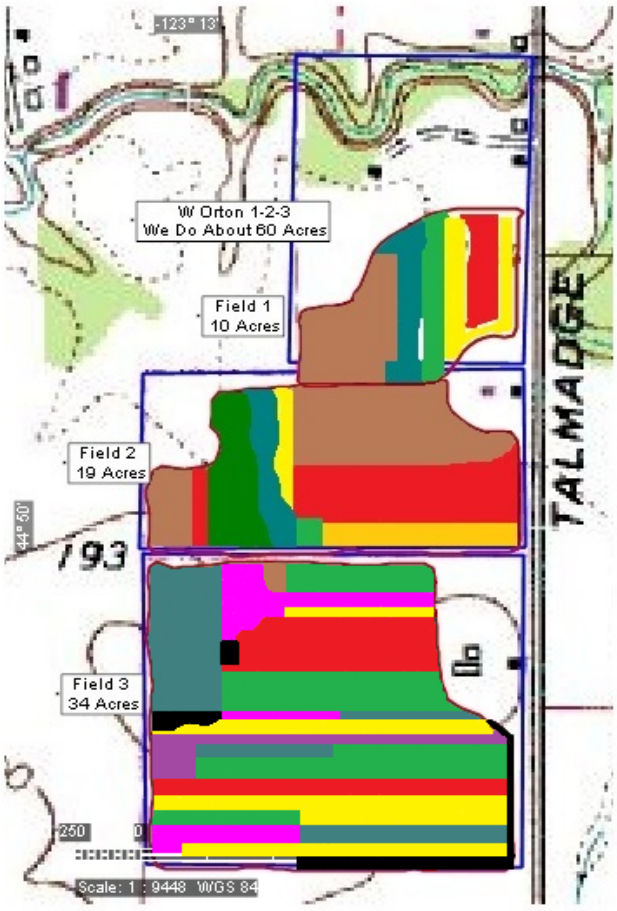
Application Dates: 06-14-19 to 10-15-19

Soil Sample Collected: 05-05-19 Domestic Well Sample Collected: No

Site and Application Identification: W. Orton 1(1_Q) & (1_R) Biosolids Product: BFP Cake @ Tract (1_R) 60 Acres DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre Acreage: 60 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on Commercial, west on Hwy 22, over bridge. Turn left (south) on Hwy 99W. Turn left (east) onto Hoffman Rd. Turn right on 16th Street which turns into Talmage Road. The field is on the right. There are several entries into the field. The first is a driveway with a sign that says "Orton Farms"
Field Input and Recommendations: 50 foot buffers at ditches and roads. 200 foot buffer at domestic wells and residences.



2019
W. ORTON 1 - DAILY APPLICATION MAP



Date	Number of Tankers	Gallons Applied	Color
6/14/19	4	25,000	Yellow
6/17/19	7	42,000	Red
6/18/19	6	36,000	Brown
8/20/19	1	6,000	Black
8/21/19	4	24,000	Yellow
8/22/19	2	12,000	Red
8/23/19	1	6,000	Green
8/26/19	1	6,000	Blue
8/27/19	5	30,000	Yellow
8/28/19	8	48,000	Orange
8/29/19	7	42,000	Green
9/2/19	1	6,000	Blue

Date	Number of Tankers	Gallons Applied	Color
9/3/19	8	48,000	Purple
9/4/19	4	24,000	Yellow
9/5/19	1	6,000	Black
9/9/19	1	6,000	Blue
9/10/19	3	18,000	Green
9/11/19	3	18,000	Red
9/19/19	4	24,000	Yellow
9/20/19	4	24,000	Pink
9/24/19	8	48,000	Blue
9/25/19	6	36,000	Green
9/26/19	8	48,000	Orange
9/27/19	2	12,000	Black
9/30/19	2	12,000	Red
10/1/19	5	30,000	Green
10/2/19	4	24,000	Blue
10/3/19	6	36,000	Yellow
10/7/19	3	18,000	Green
10/8/19	4	24,000	Red
10/9/19	4	24,000	Blue
10/10/19	6	36,000	Green
10/11/19	4	24,000	Yellow
10/15/19	6	36,000	Red

W. ORTON 1

FIELD IDENTIFICATION: W. ORTON 1 (1_R)	
OWNER: WAYNE ORTON	
LOCATION; TOWNSHIP: T8S RANGE: R5W SECTION: 31 & 32	
START DATE: 06-14-9	
STOP DATE: 10-15-19	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	60

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600 ft	475

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	517
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	149
DATE: Field Finished 10/15/2019	**143**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	6

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	115.54
PAN (TOTAL POUNDS APPLIED)	6,932.33
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,638.40
POTASSIUM (TOTAL POUNDS APPLIED)	1,069.97
TOTAL GALLONS TO FIELD	**858,000**
DRY TONS PER SITE	82.65
DRY TONS PER ACRE	1.38

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.31
ORGANIC NITROGEN (MG/KG)	35,577
INORGANIC NITROGEN (NH4) (MG/KG)	62,531
TKN (MG/KG)	98,108
PHOSPHOURUS (MG/KG)	28,061
POTASSIUM (MG/KG)	6,473
pH	7.45
ARSENIC (MG/KG)	6.82
CADMIUM (MG/KG)	1.52
CHROMIUM (MG/KG)	38.30
COPPER (MG/KG)	45
LEAD (MG/KG)	21.70
MERCURY (MG/KG)	1.18
MOLYBDENUM (MG/KG)	5.74
NICKEL (MG/KG)	15.30
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.3
ZINC (MG/KG)	883
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	21.35
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	62.53
POUNDS OF (P.A.N.)/.DRY TON	83.88

Soil Monitoring Report - 2019 (0-12inch)

Site: W. Orton
Field: W. Orton 1

Sample Date: 5/28/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	42	mg/kg
Available Phosphorus (P)	163	mg/kg
Total Potassium (K)	72	mg/kg
Sulfate-Sulfur (SO4-S)	16	mg/kg
Organic Matter	5.2	%
pH	4.9	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2019

Pollutant Parameter	Biogro™ Liquid	Belt Filter Press (BFP) Cake	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	6	6.34	6.63	41
Cadmium (Cd)	1.42	1.56	1.41	39
Chromium (Cr)	32.9	34.2	33.2	-
Copper (Cu)	341	384	330	1500
Lead (Pb)	19.2	18.9	18.1	300
Mercury (Hg)	0.48	0.5	0.57	17
Molybdenum (Mo)	5.66	5.92	5.29	-
Nickel (Ni)	15.2	14.5	13.7	420
Selenium (Se)	7.1	7.9	8.26	100
Zinc (Zn)	980	1059	900	2800
All units in mg/kg				

CITY OF Salem AT YOUR SERVICE
Public Works Department
555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

March 27, 2020

Ward Rouse
9573 54th Avenue SE
Turner OR 97392

SUBJECT: **Biosolids Land Applications**

Dear Mr. Rouse:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2019. This past year there was a total of 192.37 dry tons of Class B biosolids land applied to a total of 78 acres at the sites known as G. Rouse Fields 1, 2, 3, 4, and 5. The biosolids products you received in 2019 were Biogro™ liquid and Belt Filter Press cake.

Enclosed please find the site and land application worksheets, the daily application maps, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on March 9,2020 for average 2019 costs of fertilizer and diesel, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $2.24 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0.51/lb N
  b) Phosphorus (as P_2O_5) 11-52-0 at $540/ton or $027/lb: ($0.27/0.52) = $0.52/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $0.24/lb: ($0.240.60) = $0.40lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Biogro™ liquid and Biosolids Belt Filter Press Cake product in 2019 were as follows:

G. Rouse 1	$2114.56
G. Rouse 2	$788.24
G. Rouse 3	$1901.57
G. Rouse 4	$1362.96
G. Rouse 5	$4828.34
Total	$10,995.62

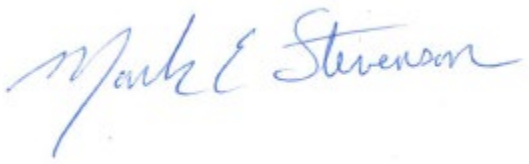
Transportation and Utility Operations
1410 20th Street SE / Building 2
Salem OR 97302-1209
Phone 503-588-6063
Fax 503-588-6480

Parks Operations
1460 20th Street SE / Building 14
Salem OR 97302-1209
Phone 503-588-6336
Fax 503-588-6305

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road N
Keizer OR 97303-6179
Phone 503-588-6380
Fax 503-588-6387

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2019 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,



Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 G Rouse Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets—G. Rouse Fields 1, 2, 3, 4, and 5
2. Land Application Worksheets—G. Rouse Fields 1, 2, 3, 4, and 5
3. Daily Application Maps—G. Rouse Fields 1, 2, 3, 4, and 5
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

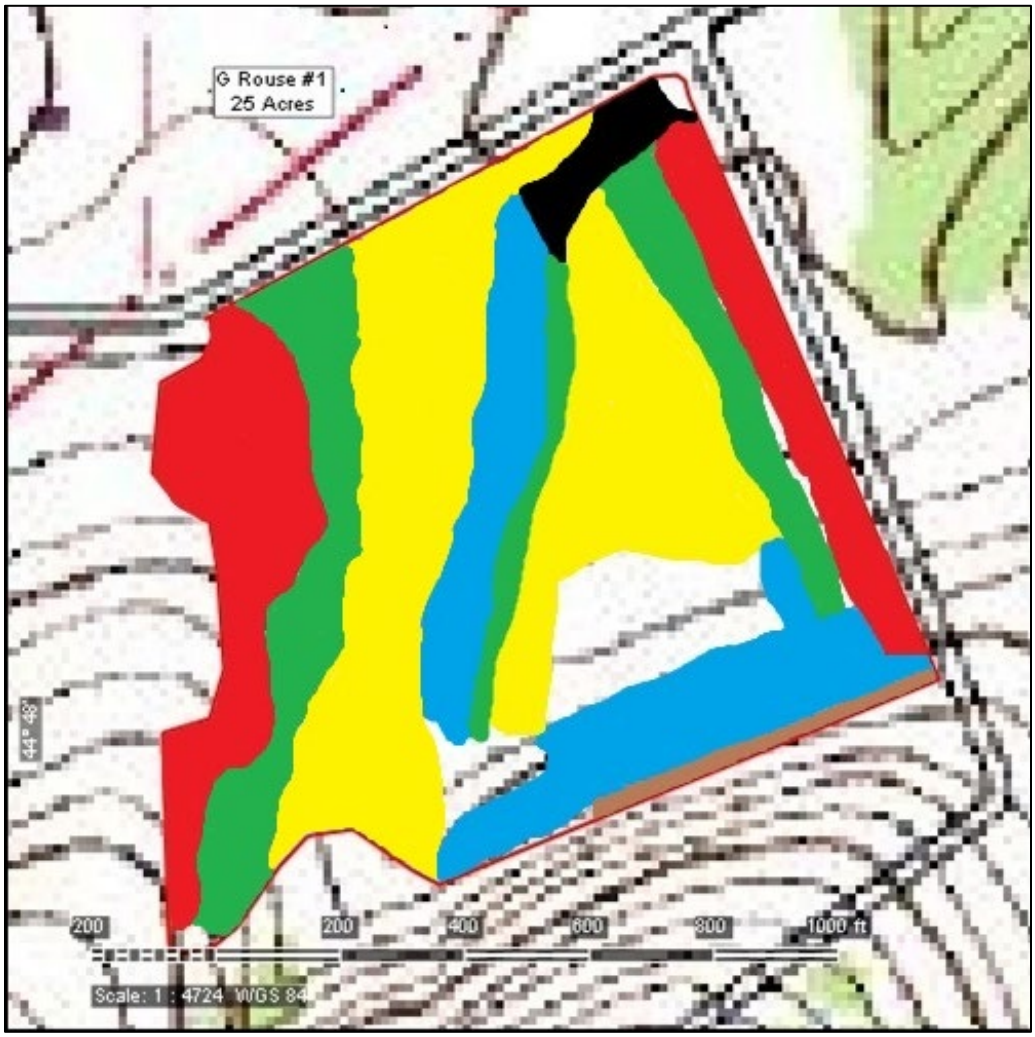
APPLICATION SITE WORKSHEET: 2019

Application Dates: 06-11-19 to 06-21-19

Soil Sample Collected: 05-22-19 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 1 (1_P) Biosolids Product: Liquid DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre Acreage: 25 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left.
Field Input and Recommendations: 50 ft buffer from ditch along Summit Loop. 200 foot buffer at domestic wells.

2019
G. ROUSE 1
DAILY APPLICATION MAP



Date	Number of Tankers	Gallons Applied	Color
6-11-19	4	26,000	Red
6-12-19	7	45,000	Green
6-13-19	11	71,000	Yellow
6-14-19	2	13,000	Blue
6-18-19	3	18,000	Brown
6-19-19	6	36,000	Blue
6-20-19	9	54,000	Red
6-21-19	3	18,000	Black

G. ROUSE 1

FIELD IDENTIFICATION: G. ROUSE 3 (3_P)	
OWNER: G. ROUSE	
LOCATION; TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 6-11-19	
STOP DATE: 6-21-19	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	25

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
APPLICATION DISTANCE IN FEET (L-L 950 RPM 37 FEET WIDE)	475

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	517
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	62
DATE: Field Finished 6/21/2019	**45**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	17

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	87.26
PAN (TOTAL POUNDS APPLIED)	2,181.50
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,459.64
POTASSIUM (TOTAL POUNDS APPLIED)	336.70
TOTAL GALLONS TO FIELD	**270,000**
DRY TONS PER SITE	26.01
DRY TONS PER ACRE	1.04

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.31
ORGANIC NITROGEN (MG/KG)	35,577
INORGANIC NITROGEN (NH4) (MG/KG)	62,531
TKN (MG/KG)	98,108
PHOSPHOURUS (MG/KG)	28,061
POTASSIUM (MG/KG)	6,473
pH	7.45
ARSENIC (MG/KG)	6.82
CADMIUM (MG/KG)	1.52
CHROMIUM (MG/KG)	38.30
COPPER (MG/KG)	45
LEAD (MG/KG)	21.70
MERCURY (MG/KG)	1.18
MOLYBDENUM (MG/KG)	5.74
NICKEL (MG/KG)	15.30
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.3
ZINC (MG/KG)	883
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	21.35
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	62.53
POUNDS OF (P.A.N.)/.DRY TON	83.88

Soil Monitoring Report (0 - 12inch) - 2019

Site: Ward Rouse
Field: G. Rouse 1

Sample Date: 5/22/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	20	mg/kg
Available Phosphorus (P)	46	mg/kg
Total Potassium (K)	123	mg/kg
Sulfate-Sulfur (SO4-S)	36	mg/kg
Organic Matter	7.4	%
pH	4.6	-

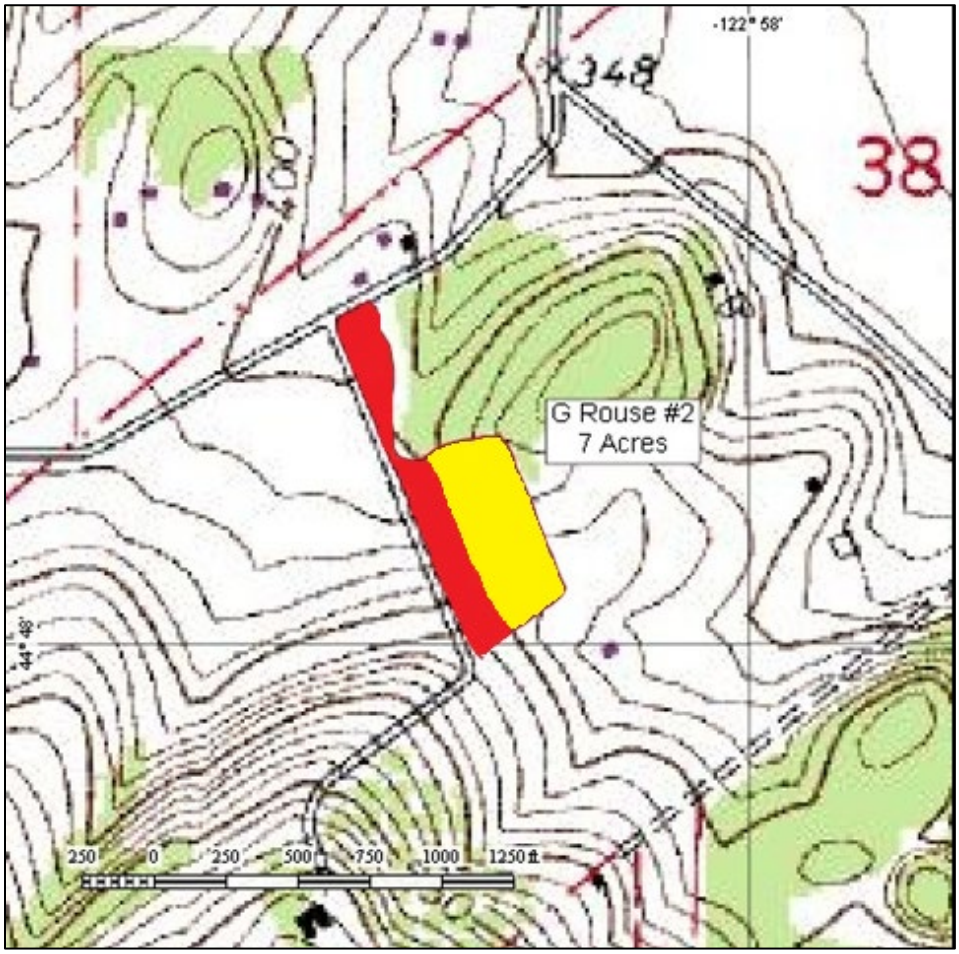
APPLICATION SITE WORKSHEET: 2019

Application Dates: 06-17-19 to 06-18-19

Soil Sample Collected: 05-22-19 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 2 (2_M) Biosolids Product: Liquid DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Acreage: 7 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left.
Field Input and Recommendations: Notify Talmadge of application. 50 ft buffer from ditch along Summit Loop. 200 foot buffer at domestic wells.

2019
G. ROUSE 2
DAILY APPLICATION MAP



Date	Number Of Tankers	Gallons Applied	Color
6-17-19	11	71,000	Yellow
6-18-19	6	36,000	Red

G. ROUSE 2

FIELD IDENTIFICATION: G. ROUSE 2 (2_M)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 06-17-2019	
Stop Date:06-18-2019 -	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	7

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
APPLICATION DISTANCE IN FEET (L-L 950 RPM 37 FEET WIDE)	475

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	517
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	17
DATE: Field Finished 76-189-19	**17**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	0

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	117.73
PAN (TOTAL POUNDS APPLIED)	824.12
PHOSPHORUS (TOTAL POUNDS APPLIED)	551.42
POTASSIUM (TOTAL POUNDS APPLIED)	127.20
TOTAL GALLONS TO FIELD	**102,000**
DRY TONS PER SITE	9.83
DRY TONS PER ACRE	1.40

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.31
ORGANIC NITROGEN (MG/KG)	35,577
INORGANIC NITROGEN (NH4) (MG/KG)	62,531
TKN (MG/KG)	98,108
PHOSPHOURUS (MG/KG)	28,061
POTASSIUM (MG/KG)	6,473
pH	7.45
ARSENIC (MG/KG)	6.82
CADMIUM (MG/KG)	1.52
CHROMIUM (MG/KG)	44.80
COPPER (MG/KG)	336
LEAD (MG/KG)	21.70
MERCURY (MG/KG)	1.18
MOLYBDENUM (MG/KG)	5.74
NICKEL (MG/KG)	15.30
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.3
ZINC (MG/KG)	883
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	21.35
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	62.53
POUNDS OF (P.A.N.)/.DRY TON	83.88

Soil Monitoring Report (0 - 12inch) - 2019

Site: Ward Rouse
Field: G. Rouse 2

Sample Date: 5/22/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	13	mg/kg
Available Phosphorus (P)	46	mg/kg
Total Potassium (K)	55	mg/kg
Sulfate-Sulfur (SO4-S)	48	mg/kg
Organic Matter	6.3	%
pH	5	-

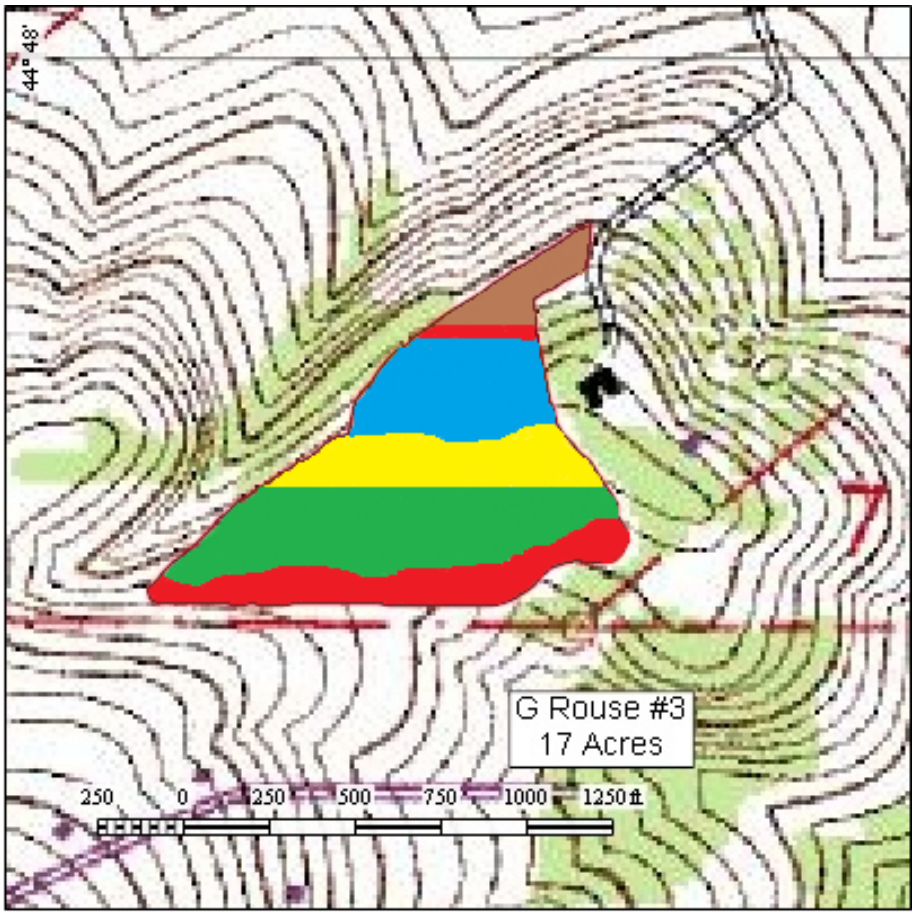
APPLICATION SITE WORKSHEET: 2019

Application Dates: 06-11-19 to 6-19-19

Soil Sample Collected: 05-27-19 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 3 (3_K) Biosolids Product: BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Acreage: 17 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left. Up Garth Rouse Sr.'s driveway behind his home.
Field Input and Recommendations: 200 foot buffer at domestic wells and residences.

2019
G. ROUSE 3
DAILY APPLICATION MAP



Date	Number Of Tankers	Gallons Applied	Color
6-11-19	7	42,000	Red
6-12-19	8	48,000	Green
6-13-19	11	66,000	Yellow
6-14-19	12	72,000	Blue
6-17-19	1	6,000	Red
6-19-19	2	12,000	Brown

G. ROUSE 3

FIELD IDENTIFICATION: G. ROUSE 3 (3_P)	
OWNER: G. ROUSE	
LOCATION; TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 6-11-19	
STOP DATE: 6-19-19	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	17

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
APPLICATION DISTANCE IN FEET (L-L 950 RPM 37 FEET WIDE)	475

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.43
GALLONS BIOSOLIDS PER ACRE	14,864
TANKERS PER ACRE	2.48
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	517
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	42
DATE: Field Finished 6/19/2019	**41**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	1

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	116.92
PAN (TOTAL POUNDS APPLIED)	1,987.59
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,329.89
POTASSIUM (TOTAL POUNDS APPLIED)	306.77
TOTAL GALLONS TO FIELD	**246,000**
DRY TONS PER SITE	23.70
DRY TONS PER ACRE	1.39

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.31
ORGANIC NITROGEN (MG/KG)	35,577
INORGANIC NITROGEN (NH4) (MG/KG)	62,531
TKN (MG/KG)	98,108
PHOSPHOURUS (MG/KG)	28,061
POTASSIUM (MG/KG)	6,473
pH	7.45
ARSENIC (MG/KG)	6.82
CADMIUM (MG/KG)	1.52
CHROMIUM (MG/KG)	38.30
COPPER (MG/KG)	45
LEAD (MG/KG)	21.70
MERCURY (MG/KG)	1.18
MOLYBDENUM (MG/KG)	5.74
NICKEL (MG/KG)	15.30
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.3
ZINC (MG/KG)	883
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	21.35
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	62.53
POUNDS OF (P.A.N.)/.DRY TON	83.88

Soil Monitoring Report (0 - 12inch) - 2019

Site: Ward Rouse
Field: G. Rouse 3

Sample Date: 5/22/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	9	mg/kg
Available Phosphorus (P)	20	mg/kg
Total Potassium (K)	66	mg/kg
Sulfate-Sulfur (SO4-S)	76	mg/kg
Organic Matter	.6.2	%
pH	4.8	-

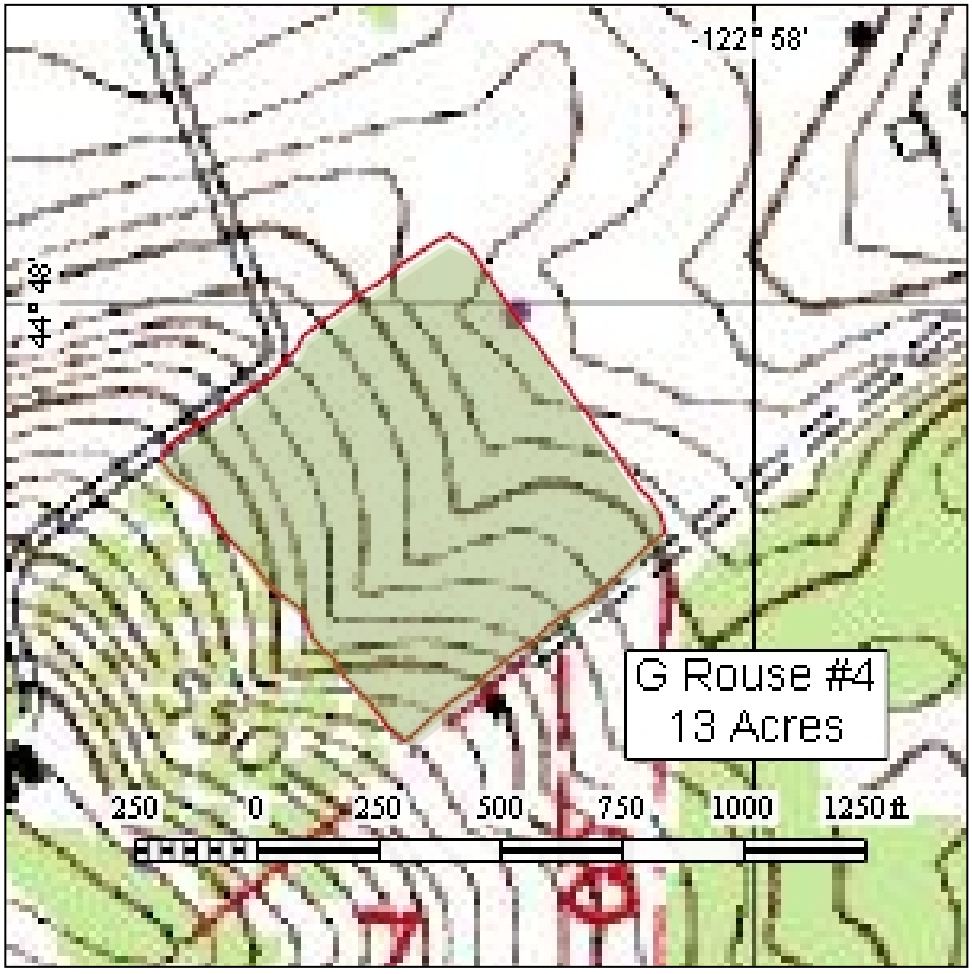
APPLICATION SITE WORKSHEET: 2019

Application Dates: 07-23-19 to 07-25-19

Soil Sample Collected: 05-27-19 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 4 (4_J) Biosolids Product: BFP Biosolids Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Acreage: 13 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left. South on Garth Rouse Sr.'s driveway at the corner, go straight into field.
Field Input and Recommendations: 200 foot buffer at domestic wells.

2019
ROUSE 4
DAILY APPLICATION MAP



Date	Number Of Spreader Loads @ 12.977 Tons/Load	Wet Tons Applied	Color
8/6/19	18	233.6	Green
Total	**18**	**233.6**	

G. ROUSE 4

FIELD IDENTIFICATION: G. ROUSE 4 (4_J)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 07-23-2019	
STOP DATE: 7-25-2019	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	14

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00
TOTAL WET TONS TO COMPLETE FIELD	252.06
DATE: Field Finished 7-25-19	**210.19**
TOTAL WET TONS REMAINING	41.87

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	100.07
PAN (TOTAL POUNDS APPLIED)	1,400.93
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,032.74
POTASSIUM (TOTAL POUNDS APPLIED)	126.88
TOTAL WET TONS APPLIED	**210.19**
TOTAL DRY TONS APPLIED	34.72
DRY TONS BIOSOLIDS PER ACRE	2.48
WET TONS BIOSOLIDS PER ACRE	15.01

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

Soil Monitoring Report (0 - 12inch) - 2019

Site: Ward Rouse
Field: G. Rouse 4

Sample Date: 5/22/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	10	mg/kg
Available Phosphorus (P)	4	mg/kg
Total Potassium (K)	44	mg/kg
Sulfate-Sulfur (SO4-S)	29	mg/kg
Organic Matter	5.6	%
pH	4.7	-

APPLICATION SITE WORKSHEET: 2019

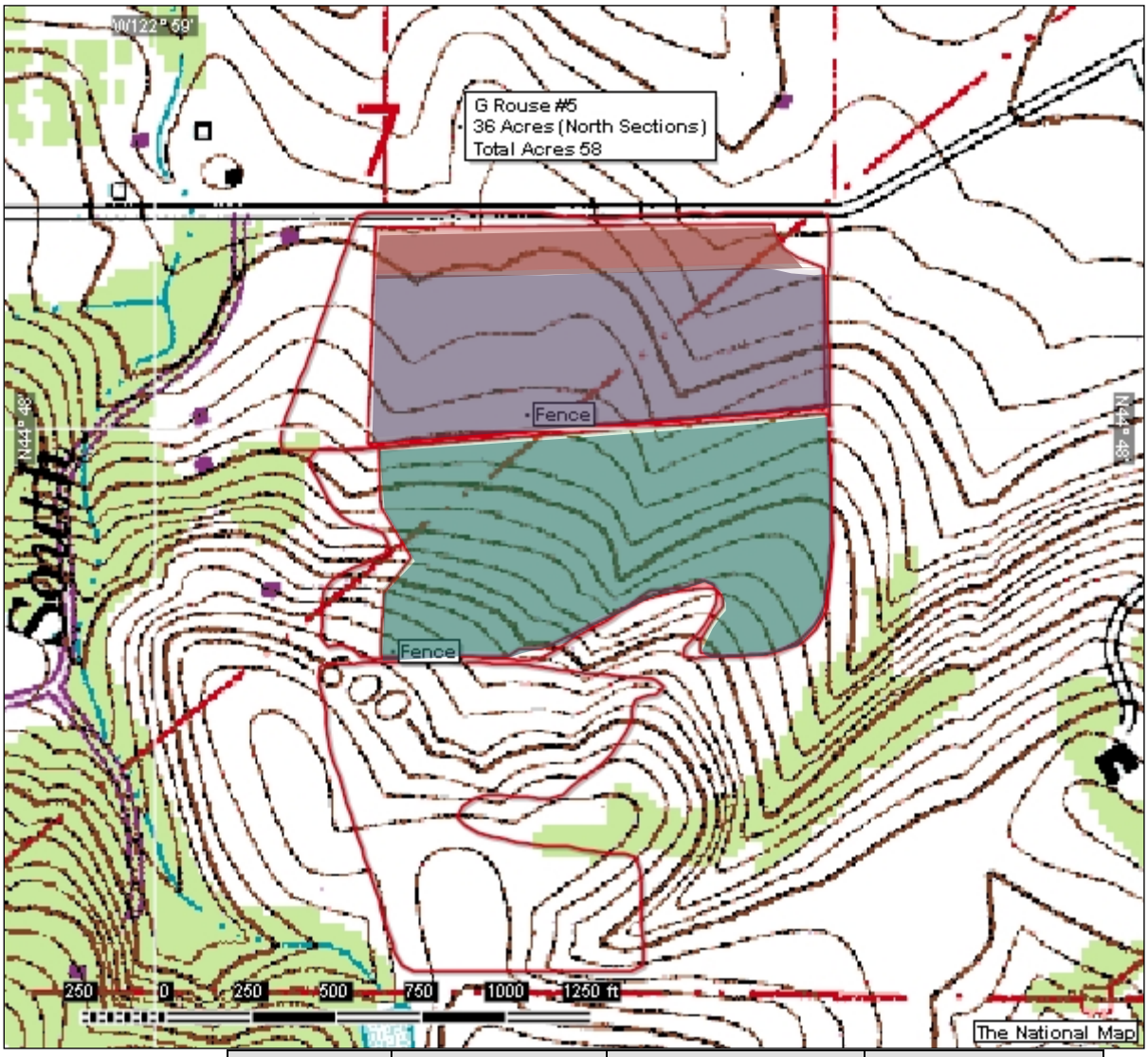
Application Dates: 07-29-19 to 07-31-19

Soil Sample Collected: No

Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 5 (5_I) Biosolids Product: BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Acreage: 36 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left. Turn south into Garth Rouse Jr. driveway for access.
Field Input and Recommendations: 200 foot buffer at domestic wells and residences.

2019
G. ROUSE 5
DAILY APPLICATION MAP



Date	Number Of Spreader Loads @ 13.495 tons/load	Wet Tons Applied	Color
7/29/19	27	364.365	Green
7/30/19	18	242.91	Purple
7/31/19	9	121.455	Red
Total	**54**	**728.73**	

G. ROUSE 5

FIELD IDENTIFICATION: G. ROUSE 5 (5_I)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 07-29-19	
STOP DATE:7-31-19	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	40

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	2.97
WET TONS BIOSOLIDS PER ACRE	18.00
TOTAL WET TONS TO COMPLETE FIELD	720.17
DATE: Field Finished 7-31-19	**751.35**
TOTAL WET TONS REMAINING	(31.18)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	125.19
PAN (TOTAL POUNDS APPLIED)	5,007.79
PHOSPHORUS (TOTAL POUNDS APPLIED)	3,691.67
POTASSIUM (TOTAL POUNDS APPLIED)	453.55
TOTAL WET TONS APPLIED	**751.35**
TOTAL DRY TONS APPLIED	124.12
DRY TONS BIOSOLIDS PER ACRE	3.10
WET TONS BIOSOLIDS PER ACRE	18.78

BIOSOLIDS ANALYSIS INFORMATION	
2018 AVERAGED DATA (BFP)	
TOTAL SOLIDS (MG/KG)	16.52
ORGANIC NITROGEN (MG/KG)	47,619
INORGANIC NITROGEN (NH4) (MG/KG)	11,774
TKN (MG/KG)	59,393
PHOSPHORUS (MG/KG)	14,871
POTASSIUM (MG/KG)	1,827
pH	8.28
ARSENIC (MG/KG)	7.73
CADMIUM (MG/KG)	1.66
CHROMIUM (MG/KG)	50.00
COPPER (MG/KG)	393
LEAD (MG/KG)	22.10
MERCURY (MG/KG)	0.80
MOLYBDENUM (MG/KG)	6.46
NICKEL (MG/KG)	15.3
SELENIUM (MG/KG)	9.1
SILVER (MG/KG)	4.4
ZINC (MG/KG)	1,041
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.57
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	11.77
POUNDS OF (P.A.N.)/.DRY TON	40.35

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2019

Pollutant Parameter	Biogro™ Liquid	Belt Filter Press (BFP) Cake	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	6	6.34	6.63	41
Cadmium (Cd)	1.42	1.56	1.41	39
Chromium (Cr)	32.9	34.2	33.2	-
Copper (Cu)	341	384	330	1500
Lead (Pb)	19.2	18.9	18.1	300
Mercury (Hg)	0.48	0.5	0.57	17
Molybdenum (Mo)	5.66	5.92	5.29	-
Nickel (Ni)	15.2	14.5	13.7	420
Selenium (Se)	7.1	7.9	8.26	100
Zinc (Zn)	980	1059	900	2800
All units in mg/kg				

Section 7:
Biosolids Transport Records

NOTE:

DEWATERED BIOSOLIDS TRANSPORT

In the cake transport tables, colored cells are used to distinguish different field destinations. If Contractor was used, cells are colored yellow to indicate contracted loads hauled.

Multiple columns are utilized to indicate additional loads transported per day. Cells are left blank if no loads were transported.

LIQUID BIOSOLIDS TRANSPORT

In the liquid transport tables, colored cells are utilized to distinguish different field destinations.

Multiple columns are utilized to distinguish gallons transported and applied by Biogro™ from gallons transported and applied by Contractor. Cells are left blank if no loads were transported/applied.

Section 7a:

Dewatered Biosolids Transport Records

2019 JANUARY: WET TONS (DEWATERED BIOSOLIDS)																	
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP		CENT	BFP				
1	TUE														0.00	0.00	0.00
2	WED	23057	33.29		23059	33.98								Eastern Oregon Filbin 6	67.27	67.27	0.00
3	THU	23061	33.55												33.55	33.55	0.00
4	FRI	23064	33.33		23065	33.06									66.39	66.39	0.00
5	SAT	23067	33.10												33.10	33.10	0.00
6	SUN														0.00	0.00	0.00
7	MON	23071	33.70											Eastern Oregon Filbin	33.70	33.70	0.00
8	TUE														0.00	0.00	0.00
9	WED														0.00	0.00	0.00
10	THU														0.00	0.00	0.00
11	FRI	23073	31.99											Eastern Oregon Filbin	31.99	31.99	0.00
12	SAT														0.00	0.00	0.00
13	SUN														0.00	0.00	0.00
14	MON	23075	33.15		23078	33.58		23079	28.84					Eastern Oregon Filbin	95.57	95.57	0.00
15	TUE	23081	32.23												32.23	32.23	0.00
16	WED														0.00	0.00	0.00
17	THU														0.00	0.00	0.00
18	FRI	23083	29.57		23086	31.86		23087	32.90					Eastern Oregon Filbin	94.33	94.33	0.00
19	SAT	23089	31.53		23091	32.25									63.78	63.78	0.00
20	SUN														0.00	0.00	0.00
21	MON														0.00	0.00	0.00
22	TUE														0.00	0.00	0.00
23	WED	23093	32.23		23095	22.97								Eastern Oregon Filbin	55.20	55.20	0.00
24	THU	23097	31.03												31.03	31.03	0.00
25	FRI	23099	30.24												30.24	30.24	0.00
26	SAT														0.00	0.00	0.00
27	SUN														0.00	0.00	0.00
28	MON	23101	32.38											Eastern Oregon Filbin 6	32.38	32.38	0.00
29	TUE	23103	32.51		23105	34.27									66.78	66.78	0.00
30	WED	23107	30.53		23109	33.37		23111	33.01						96.91	96.91	0.00
31	THU	23114	30.65		23115	32.62									63.27	63.27	0.00
WET TONS AND POUNDS: Monthly Totals															**927.72**	**927.72**	**0.00**
															% of Total	**100.0%**	**0%**

2019 FEBRUARY: WET TONS (DEWATERED BIOSOLIDS)														
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP				
1	FRI	23117	32.66	0.00							Eastern Oregon Filbin	32.66	32.66	0.00
2	SAT											0.00	0.00	0.00
3	SUN											0.00	0.00	0.00
4	MON											0.00	0.00	0.00
5	TUE											0.00	0.00	0.00
6	WED											0.00	0.00	0.00
7	THU											0.00	0.00	0.00
8	FRI											0.00	0.00	0.00
9	SAT											0.00	0.00	0.00
10	SUN											0.00	0.00	0.00
11	MON											0.00	0.00	0.00
12	TUE											0.00	0.00	0.00
13	WED											0.00	0.00	0.00
14	THU											0.00	0.00	0.00
15	FRI											0.00	0.00	0.00
16	SAT											0.00	0.00	0.00
17	SUN											0.00	0.00	0.00
18	MON	23119	33.15	0.00							Eastern Oregon Filbin	33.15	33.15	0.00
19	TUE	23122	32.03	0.00	23123	34.61	0.00	23125	33.64	0.00		100.28	100.28	0.00
20	WED	23127	33.87	0.00	23129	33.93	0.00	23131	32.82	0.00		100.62	100.62	0.00
21	THU	23133	34.02	0.00	23135	31.42	0.00	23137	31.91	0.00		97.35	97.35	0.00
22	FRI	23139	33.12	0.00								33.12	33.12	0.00
23	SAT											0.00	0.00	0.00
24	SUN											0.00	0.00	0.00
25	MON											0.00	0.00	0.00
26	TUE											0.00	0.00	0.00
27	WED											0.00	0.00	0.00
28	THU											0.00	0.00	0.00
WET TONS AND POUNDS: Monthly Totals												**397.18**	**397.18**	**0.00**
												% of Total	**100.0%**	**0%**

2019 MARCH: WET TONS (DEWATERED BIOSOLIDS)													
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP				
1	FRI											0.00	0.00	0.00
2	SAT											0.00	0.00	0.00
3	SUN											0.00	0.00	0.00
4	MON											0.00	0.00	0.00
5	TUE											0.00	0.00	0.00
6	WED											0.00	0.00	0.00
7	THU											0.00	0.00	0.00
8	FRI											0.00	0.00	0.00
9	SAT											0.00	0.00	0.00
10	SUN											0.00	0.00	0.00
11	MON											0.00	0.00	0.00
12	TUE											0.00	0.00	0.00
13	WED											0.00	0.00	0.00
14	THU											0.00	0.00	0.00
15	FRI											0.00	0.00	0.00
16	SAT											0.00	0.00	0.00
17	SUN											0.00	0.00	0.00
18	MON	23141	34.40	0.00								34.40	34.40	0.00
19	TUE	23145	32.73	0.00	23143	33.61	0.00				Eastern Oregon Filbin 6	66.34	66.34	0.00
20	WED	23147	34.86	0.00								34.86	34.86	0.00
21	THU											0.00	0.00	0.00
22	FRI											0.00	0.00	0.00
23	SAT											0.00	0.00	0.00
24	SUN											0.00	0.00	0.00
25	MON											0.00	0.00	0.00
26	TUE											0.00	0.00	0.00
27	WED											0.00	0.00	0.00
28	THU											0.00	0.00	0.00
29	FRI											0.00	0.00	0.00
30	SAT											0.00	0.00	0.00
31	SUN											0.00	0.00	0.00
WET TONS AND POUNDS: Monthly Totals												**135.60**	**135.60**	**0.00**
												% of Total	**100.0%**	**0%**

2019 APRIL: WET TONS (DEWATERED BIOSOLIDS)													
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP				
1	MON	23151	35.02	0.00								35.02	35.02	0.00
2	TUE	23149	33.54	0.00							Eastern Oregon Filbin 5	33.54	33.54	0.00
3	WED	23153	35.55	0.00								35.55	35.55	0.00
4	THU											0.00	0.00	0.00
5	FRI											0.00	0.00	0.00
6	SAT											0.00	0.00	0.00
7	SUN											0.00	0.00	0.00
8	MON											0.00	0.00	0.00
9	TUE											0.00	0.00	0.00
10	WED											0.00	0.00	0.00
11	THU											0.00	0.00	0.00
12	FRI											0.00	0.00	0.00
13	SAT											0.00	0.00	0.00
14	SUN											0.00	0.00	0.00
15	MON											0.00	0.00	0.00
16	TUE											0.00	0.00	0.00
17	WED											0.00	0.00	0.00
18	THU											0.00	0.00	0.00
19	FRI											0.00	0.00	0.00
20	SAT											0.00	0.00	0.00
21	SUN											0.00	0.00	0.00
22	MON	23155	36.22								Eastern Oregon Filbin 5	36.22	36.22	0.00
23	TUE	23157	33.88								Eastern Oregon Filbin 5	33.88	33.88	0.00
24	WED											0.00	0.00	0.00
25	THU											0.00	0.00	0.00
26	FRI											0.00	0.00	0.00
27	SAT											0.00	0.00	0.00
28	SUN											0.00	0.00	0.00
29	MON											0.00	0.00	0.00
30	TUE											0.00	0.00	0.00
WET TONS AND POUNDS: Monthly Totals												**174.21**	**174.21**	**0.00**
												% of Total	**100.0%**	**0%**

2019 MAY: WET TONS (DEWATERED BIOSOLIDS)																	
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP		CENT	BFP				
1	WED														0.00	0.00	0.00
2	THU													Eastern Oregon Filbin 5	0.00	0.00	0.00
3	FRI														0.00	0.00	0.00
4	SAT														0.00	0.00	0.00
5	SUN														0.00	0.00	0.00
6	MON	23159	32.80		23161	35.26									68.06	68.06	0.00
7	TUE														0.00	0.00	0.00
8	WED	23163	35.79												35.79	35.79	0.00
9	THU	23169	33.81		23171	32.46		23172	35.19						101.46	101.46	0.00
10	FRI	23175	34.37		23176	28.85									63.22	63.22	0.00
11	SAT	23179	34.49		23180	32.14									66.63	66.63	0.00
12	SUN														0.00	0.00	0.00
13	MON	23182	33.38		23184	32.65									66.03	66.03	0.00
14	TUE	23187	30.45		23188	33.69									64.14	64.14	0.00
15	WED	23192	33.44		23194	31.93									65.37	65.37	0.00
16	THU	23196	34.81		23198	30.90									65.71	65.71	0.00
17	FRI	23200	33.49												33.49	33.49	0.00
18	SAT	23203	33.16		23204	33.30		23206	32.36						98.82	98.82	0.00
19	SUN														0.00	0.00	0.00
20	MON	23208	32.16		23209	33.60									65.76	65.76	0.00
21	TUE	23213	32.64		23214	35.28		23216		23.95	23217		23.41	Filbin / Etzel #4	115.28	67.92	47.36
22	WED	23223	36.09		23226	32.86		23220		21.88	23222/27		44.55	Filbin / Etzel #4	135.38	68.95	66.43
23	THU	23232	31.97		23235	32.81		23233		22.58	23234/38		44.27	Filbin / Etzel #4	131.63	64.78	66.85
24	FRI	23243	35.19					23242		24.39	23245/47		44.86	Filbin / Etzel #4	104.44	35.19	69.25
25	SAT	23250	33.49											Filbin / Etzel #4	33.49	33.49	0.00
26	SUN													Filbin / Etzel #4	0.00	0.00	0.00
27	MON							23251		24.37				Filbin / Etzel #4	24.37	0.00	24.37
28	TUE	23256	35.06		23258	32.22								Filbin / Etzel #4	67.28	67.28	0.00
29	WED	23260	35.20		23262	32.17								Filbin / Etzel #4	67.37	67.37	0.00
30	THU	23266	30.48		23264	33.16		23253		20.79	23254/68		47.62	Filbin / Etzel #4	132.05	63.64	68.41
31	FRI	23272	35.68		23277	35.00		23278	32.50		23274-75-80		69.12	Filbin / Etzel #4	172.30	103.18	69.12
WET TONS AND POUNDS: Monthly Totals															**1778.07**	**1366.28**	**411.79**
															% of Total	**76.8%**	**23%**

2019 JUNE: WET TONS (DEWATERED BIOSOLIDS)														
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP					
1	SAT	23285	31.55		23287	34.66		23288	32.50				98.71	98.71	0.00
2	SUN												0.00	0.00	0.00
3	MON	23290	34.79		23292	35.38		23295-293		48.57		Etzel 4	118.74	70.17	48.57
4	TUE	23301	33.51		23002	33.70							67.21	67.21	0.00
5	WED										Filbin 5		0.00	0.00	0.00
6	THU	23305	33.50		23307	32.18		23308	32.98				98.66	98.66	0.00
7	FRI	23311	32.59		23312	31.22							63.81	63.81	0.00
8	SAT	23314	32.47		23316	32.07							64.54	64.54	0.00
9	SUN												0.00	0.00	0.00
10	MON												0.00	0.00	0.00
11	TUE												0.00	0.00	0.00
12	WED												0.00	0.00	0.00
13	THU												0.00	0.00	0.00
14	FRI												0.00	0.00	0.00
15	SAT												0.00	0.00	0.00
16	SUN												0.00	0.00	0.00
17	MON												0.00	0.00	0.00
18	TUE												0.00	0.00	0.00
19	WED												0.00	0.00	0.00
20	THU												0.00	0.00	0.00
21	FRI												0.00	0.00	0.00
22	SAT												0.00	0.00	0.00
23	SUN												0.00	0.00	0.00
24	MON												0.00	0.00	0.00
25	TUE												0.00	0.00	0.00
26	WED												0.00	0.00	0.00
27	THU												0.00	0.00	0.00
28	FRI												0.00	0.00	0.00
29	SAT												0.00	0.00	0.00
30	SUN												0.00	0.00	0.00
WET TONS AND POUNDS: Monthly Totals													**511.67**	**463.10**	**48.57**
													% of Total	**90.5%**	**9%**

2019 JUly: WET TONS (DEWATERED BIOSOLIDS)																			
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	APPLICATION SITE	APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP		CENT	BFP						
1	MON	23318		23.76										Rouse # 5			23.76	0.00	23.76
2	TUE	23320		22.82	23322		22.83										45.65	0.00	45.65
3	WED	23324		24.35	23326		23.69										48.04	0.00	48.04
4	THU	23328		23.14	23330		23.82										46.96	0.00	46.96
5	FRI	23332		23.20	23334		23.64										46.84	0.00	46.84
6	SAT																0.00	0.00	0.00
7	SUN																0.00	0.00	0.00
8	MON	23336		23.22	23338		23.39										46.61	0.00	46.61
9	TUE	23343		22.88	23340		23.74										46.62	0.00	46.62
10	WED	23345		23.73	23347		23.25										46.98	0.00	46.98
11	THU	23349		22.97	23351		23.23	23353		19.99							66.19	0.00	66.19
12	FRI	23355		24.15	23357		24.22	23359		20.68							69.05	0.00	69.05
13	SAT	23362		22.40	23364		23.85										46.25	0.00	46.25
14	SUN																0.00	0.00	0.00
15	MON																0.00	0.00	0.00
16	TUE	23366		22.75	23368		23.75	23370		16.05							62.55	0.00	62.55
17	WED	23372		22.63	23374		22.91	23378		18.37							63.91	0.00	63.91
18	THU	23380		23.27	23382		23.04										46.31	0.00	46.31
19	FRI	23384		23.01													23.01	0.00	23.01
20	SAT																0.00	0.00	0.00
21	SUN																0.00	0.00	0.00
22	MON	23386		22.62	23388		23.42	23390		14.02				Rouse #5	Rouse #4		60.06	0.00	60.06
23	TUE	23392		23.85	23394		22.78	23396		17.94							64.57	0.00	64.57
24	WED	23398		24.27	23400		21.88	23402		17.23							63.38	0.00	63.38
25	THU	23404		23.30	23406		22.29	23408		18.25						Elam 1	63.84	0.00	63.84
26	FRI	23410		24.10	23412		22.24	23414		19.55				Elam 1			65.89	0.00	65.89
27	SAT	23416		24.21	23418		22.41										46.62	0.00	46.62
28	SUN																0.00	0.00	0.00
29	MON	23420		22.26	23422		23.23	23424		14.77				Elam 1(12 acres)			60.26	0.00	60.26
30	TUE	23426		22.72	23428		22.87										45.59	0.00	45.59
31	WED																0.00	0.00	0.00
WET TONS AND POUNDS: Monthly Totals																	**1198.94**	**0.00**	**1198.94**
																	% of Total	**0.0%**	**100%**

2019 August: WET TONS (DEWATERED BIOSOLIDS)																		
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	APPLICATION SITE	APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP		CENT	BFP						
1	THU	23431		23.12	23433		16.30							Elam 1 (17 Acres)			39.42	0.00	39.42
2	FRI	23435		22.94	23436		19.94	23438		21.88							64.76	0.00	64.76
3	SAT	23441		21.40	23443		22.45	23445		18.69							62.54	0.00	62.54
4	SUN																0.00	0.00	0.00
5	MON	23447		22.16	23449		22.62	23451		18.82							63.60	0.00	63.60
6	TUE	56-63-65-66-68-71-72-76	243.53		23453		23.58	23454		20.38	23458		23.18	Gross 11(Tribeca)	Elam 1 (17 Acres)		310.67	243.53	67.14
7	WED	85-86-90-91-92-94	161.16		23477		23.01	23481		23.30				Gross 11(Tribeca)			207.47	161.16	46.31
8	THU	96-99-00-01-07	145.62		23487		19.90	23502		22.74	23506		23.39	Gross 11(Tribeca)	Elam/cook	Elam/cook	211.65	145.62	66.03
9	FRI	17-18-20-22	123.43		23510		22.82	23511		21.35	23521		22.53	Gross 11(Tribeca)	Elam/cook		190.13	123.43	66.70
10	SAT	29	30.28		23524		23.38	23526		20.07	23527		22.71	Gross 11(Tribeca)	Elam/cook		96.44	30.28	66.16
11	SUN	35-36-37	90.91											Gross 11(Tribeca)	Elam/cook		90.91	90.91	0.00
12	MON	46-47-49-50-52-53-57	217.58		23538		22.77	23540		20.54	23543		23.65	Gross 11(Tribeca)	Elam/cook		284.54	217.58	66.96
13	TUE	60-67-69	85.57		23558		22.96	23559		21.20	23562		23.43	Gross 11(Tribeca)	Elam/cook		153.16	85.57	67.59
13	TUE	72-73-74-77-80	151.93											Gross 3(Tribeca)				151.93	
14	WED	88-90-92-94	122.64		23579		21.94	23581		20.75	23585		23.04	Gross 3(Tribeca)	Elam/cook		188.37	122.64	65.73
15	THU	98	32.27		23596		22.67	23597		19.46	23602		22.39	Gross 3(Tribeca)	Elam/cook		96.79	32.27	64.52
15	THU	23607-23609-23610	89.52											Gross 8(Tribeca)				89.52	
16	FRI				23611		24.21	23614		23.30	23612		20.72	Gross 8(Tribeca)			68.23	0.00	68.23
17	SAT																0.00	0.00	0.00
18	SUN																0.00	0.00	0.00
19	MON	23623-23625-23628	103.26		23617		19.73	23618		20.17	23620		22.94	Gross 8(Tribeca)	Elam/cook	Elam/cook	166.10	103.26	62.84
20	TUE	23632-23638-23639-42	124.75		23629		23.10	23630		20.11	23634		22.90	Gross 8(Tribeca)	Elam/cook	Elam/cook	190.86	124.75	66.11
21	WED	23650	30.29		23643		23.34	23644		20.18	23646		23.06	Gross 8(Tribeca)	Gross 8(BFP)	Gross 8 (BFP)	96.87	30.29	66.58
22	THU	23658	33.27		23651		22.02	23652		20.66	23654		23.25	Gross 8(Tribeca)	Gross 8(BFP)	Gross 8(BFP)	99.20	33.27	65.93
23	FRI				23663		19.32	23661		23.08	23659		20.53		Gross 8(BFP)	Gross 8(BFP)	62.93	0.00	62.93
24	SAT	23671	40.36		23666		21.27	23667		20.34	23669		22.39	Gross 8(Tribeca)	Gross 8(BFP)	Gross 8(BFP)	104.36	40.36	64.00
25	SUN																0.00	0.00	0.00
26	MON				23675		22.48	23676		20.26	23678		22.84		Gross 8(BFP)	Gross 8(BFP)	65.58	0.00	65.58
27	TUE				23681		22.62	23682		21.34	23685	2.85	20.99		Gross 8(BFP)	Gross 8(BFP)	67.80	2.85	64.95
28	WED				23687		21.14	23688		20.06	23690		23.20		Gross 8(BFP)	Gross 8(BFP)	64.40	0.00	64.40
29	THU				23694		24.02	23695		21.01	23698		23.20		Gross 8(BFP)	Gross 8(BFP)	68.23	0.00	68.23
30	FRI				23700		23.01	23703		23.16	23702		21.23		Elam/cook	Elam/cook	67.40	0.00	67.40
31	SAT																0.00	0.00	0.00
WET TONS AND POUNDS: Monthly Totals																	**3182.41**	**1829.22**	**1594.64**
																	% of Total	**57.5%**	**50%**

2019 September: WET TONS (DEWATERED BIOSOLIDS)														
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP					
1	SUN												0.00	0.00	0.00
2	MON	23706		19.38	23707		20.72	23709		22.53	Gross 8(BFP)	Gross 8(BFP)	62.63	0.00	62.63
3	TUE												0.00	0.00	0.00
4	WED	23712		21.96	23713		21.29	23715		23.21	Elam/cook		66.46	0.00	66.46
5	THU	23718		22.82	23720		23.17	23722		20.80			66.79	0.00	66.79
6	FRI	23724		23.35	23726		20.20	23727		22.95			66.50	0.00	66.50
7	SAT												0.00	0.00	0.00
8	SUN												0.00	0.00	0.00
9	MON	23730		21.86	23731		23.48	23733		22.73	Elam/cook		68.07	0.00	68.07
10	TUE	23736		23.24	23737		20.21	23739		23.56			67.01	0.00	67.01
11	WED	23743		22.88	23744		20.65	23747		23.24			66.77	0.00	66.77
12	THU												0.00	0.00	0.00
13	FRI												0.00	0.00	0.00
14	SAT												0.00	0.00	0.00
15	SUN												0.00	0.00	0.00
16	MON	23749		21.82							Elam/cook		21.82	0.00	21.82
17	TUE												0.00	0.00	0.00
18	WED												0.00	0.00	0.00
19	THU												0.00	0.00	0.00
20	FRI												0.00	0.00	0.00
21	SAT												0.00	0.00	0.00
22	SUN												0.00	0.00	0.00
23	MON												0.00	0.00	0.00
24	TUE												0.00	0.00	0.00
25	WED												0.00	0.00	0.00
26	THU												0.00	0.00	0.00
27	FRI	23751		20.78	23753		24.48				Sandau/Mader		45.26	0.00	45.26
28	SAT												0.00	0.00	0.00
29	SUN												0.00	0.00	0.00
30	MON	23757		22.77	23755		21.94						44.71	0.00	44.71
WET TONS AND POUNDS: Monthly Totals													**576.02**	**0.00**	**576.02**
													% of Total	**0.0%**	**100%**

2019 OCTOBER: WET TONS (DEWATERED BIOSOLIDS)													
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP				
1	TUE	23761		23.63	23759		22.65				Sandau/Mader	46.28	0.00	46.28
2	WED	70-74-76-77-79		163.72	23766		23.57	23763		22.94		210.23	0.00	210.23
3	THU	85--89-91-92-93 -95--96-98-00-02-03		348.47	23780		23.20	23784		23.32		394.99	0.00	394.99
4	FRI											0.00	0.00	0.00
5	SAT											0.00	0.00	0.00
6	SUN											0.00	0.00	0.00
7	MON	23804		23.16								23.16	0.00	23.16
8	TUE											0.00	0.00	0.00
9	WED											0.00	0.00	0.00
10	THU											0.00	0.00	0.00
11	FRI											0.00	0.00	0.00
12	SAT											0.00	0.00	0.00
13	SUN											0.00	0.00	0.00
14	MON											0.00	0.00	0.00
15	TUE											0.00	0.00	0.00
16	WED											0.00	0.00	0.00
17	THU											0.00	0.00	0.00
18	FRI											0.00	0.00	0.00
19	SAT											0.00	0.00	0.00
20	SUN											0.00	0.00	0.00
21	MON											0.00	0.00	0.00
22	TUE											0.00	0.00	0.00
23	WED											0.00	0.00	0.00
24	THU											0.00	0.00	0.00
25	FRI											0.00	0.00	0.00
26	SAT											0.00	0.00	0.00
27	SUN											0.00	0.00	0.00
28	MON											0.00	0.00	0.00
29	TUE											0.00	0.00	0.00
30	WED											0.00	0.00	0.00
31	THU											0.00	0.00	0.00
WET TONS AND POUNDS: Monthly Totals												**674.66**	**0.00**	**674.66**
												% of Total	**0.0%**	**100%**

2019 November: WET TONS (DEWATERED BIOSOLIDS)										
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE
			CENT	BFP		CENT	BFP		CENT	BFP	
1	FRI										
2	SAT										
3	SUN										
4	MON										
5	TUE										
6	WED										
7	THU										
8	FRI										
9	SAT										
10	SUN										
11	MON										
12	TUE										
13	WED										
14	THU										
15	FRI										
16	SAT										
17	SUN										
18	MON										
19	TUE										
20	WED										
21	THU										
22	FRI										
23	SAT										
24	SUN										
25	MON	23806	31.66								Filbin #5
26	TUE	23810	29.30								
27	WED										
28	THU										
29	FRI										
30	SAT										
WET TONS AND POUNDS: Monthly Totals											

2019 Decemberr: WET TONS (DEWATERED BIOSOLIDS)														
DATE	DAY	WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		WEIGHT TICKET	WET TONS		APPLICATION SITE	TOTAL WET TONS	CENT TONS	BFP TONS
			CENT	BFP		CENT	BFP		CENT	BFP				
1	SUN											0.00	0.00	0.00
2	MON											0.00	0.00	0.00
3	TUE											0.00	0.00	0.00
4	WED	23812	32.48								Filbin #5	32.48	32.48	0.00
5	THU	23814	33.33		23815	30.79						64.12	64.12	0.00
6	FRI	23817	34.31		23819	32.82						67.13	67.13	0.00
7	SAT	23821	35.26		23823	32.59						67.85	67.85	0.00
8	SUN											0.00	0.00	0.00
9	MON	23825	33.04		23827	32.14						65.18	65.18	0.00
10	TUE	23829	33.48		23831	32.13						65.61	65.61	0.00
11	WED	23833	33.35									33.35	33.35	0.00
12	THU	23835	33.43		23837	32.10						65.53	65.53	0.00
13	FRI	23839	33.85		23841	31.37						65.22	65.22	0.00
14	SAT	23843	29.52									29.52	29.52	0.00
15	SUN											0.00	0.00	0.00
16	MON	23845	32.49									32.49	32.49	0.00
17	TUE	23848	34.38		23849	32.74						67.12	67.12	0.00
18	WED	23851	31.31									31.31	31.31	0.00
19	THU	23853	31.20									31.20	31.20	0.00
20	FRI											0.00	0.00	0.00
21	SAT	23855	32.47									32.47	32.47	0.00
22	SUN											0.00	0.00	0.00
23	MON	23857	32.14									32.14	32.14	0.00
24	TUE											0.00	0.00	0.00
25	WED											0.00	0.00	0.00
26	THU	23859	32.17									32.17	32.17	0.00
27	FRI	23861	31.28									31.28	31.28	0.00
28	SAT	23863	32.10									32.10	32.10	0.00
29	SUN											0.00	0.00	0.00
30	MON	23865	32.35									32.35	32.35	0.00
31	TUE	23867	30.67									30.67	30.67	0.00
WET TONS AND POUNDS: Monthly Totals												**941.29**	**941.29**	**0.00**
												% of Total	**100.0%**	**0%**

2019 ANNUAL TOTAL WET TONS & LIQUID GALLONS PRODUCED						
MONTH	CENT. WET TONS	CENT. DRY TONS	BFP WET TONS	BFP DRY TONS	LIQUID GALLONS	LIQUID DRY TONS
JAN	927.72	227.79				
FEB	397.18	95.72				
MAR	135.60	33.67				
APR	174.21	43.80				
MAY	1366.28	339.79	411.79	63.33		
JUN	463.10	119.29	48.57	7.16	1,109,000	112.38
JUL	0.00	0.00	1198.94	198.42	600,000	59.55
AUG	1829.22	515.29	1594.64	265.19	372,000	36.61
SEP			576.02	95.85	330,000	34.13
OCT	0.00	0.00	674.66	111.45	132,000	13.27
NOV	60.96	15.62				
DEC	941.29	238.15				
TOTAL	**6295.56**	**1629.12**	**4504.62**	**741.41**	**2543000.00**	**255.93**

TOT. DRY TONS	CENT. DRY TONS	BFP DRY TONS	LIQUID DRY TONS
2626.46	1,629.12	741.41	255.93

2019 Monthly Total Solids In %			
MONTH	CENT	BFP	LIQ
JAN	24.55%		
FEB	24.10%		
MAR	24.83%		
APR	25.14%		
MAY	24.87%	15.38%	
JUN	25.76%	14.75%	2.43%
JUL		16.55%	2.38%
AUG	28.17%	16.63%	2.36%
SEP		16.64%	2.48%
OCT	26.16%	16.52%	2.41%
NOV	25.62%		
DEC	25.30%		

Section 7b:

Liquid Biosolids Transport Records

2019 JUNE: LIQUID APPLICATION								
DATE	DAY	BIOGRO	BIOGRO	BIOGRO	APPLICATION SITE	APPLICATION SITE	APPLICATION SITE	OPS SQL Gallons
1	SAT							0
2	SUN							0
3	MON							0
4	TUE	24000			ELAM/BRICKER			24000
5	WED	42000						42000
6	THU	54000						54000
7	FRI	18000						18000
8	SAT							0
9	SUN							0
10	MON	42000			ELAM/BRICKER			42000
11	TUE	12000	26000	42000		**ROUSE 1**	ROUSE 3	80000
12	WED		45000	48000				93000
13	THU		71000	66000				137000
14	FRI	25000	13000	72000	W ORTON 1			110000
15	SAT							0
16	SUN							0
17	MON	42000	71000	6000	W ORTON 1	**ROUSE 2**	ROUSE 3	119000
18	TUE	36000	36000	18000	W ORTON 1	**ROUSE 2**	**ROUSE 1**	90000
19	WED		12000	36000		ROUSE 3	**ROUSE 1**	48000
20	THU			54000				54000
21	FRI			18000				18000
22	SAT							0
23	SUN							0
24	MON	36000			ELAM/BRICKER			36000
25	TUE	54000						54000
26	WED	48000						48000
27	THU	24000						24000
28	FRI	18000						18000
29	SAT							0
30	SUN							0
LIQUID GALLONS: Monthly Total								**1,109,000**

2019 August: LIQUID APPLICATION						
DATE	DAY	BIOGRO	BIOGRO	APPLICATION SITE	APPLICATION SITE	OPS-SQL GALLONS
1	MON	42,000		ELAM/BRICKER		42000
2	TUE	24,000				24000
3	WED	42,000				42000
4	THU	18,000				18000
5	FRI					0
6	SAT					0
7	SUN					0
8	MON	12,000				12000
9	TUE	42,000				42000
10	WED	48,000				48000
11	THU	30,000				30000
12	FRI	12,000				12000
13	SAT					0
14	SUN					0
15	MON					0
16	TUE	42,000				42000
17	WED	42,000				42000
18	THU	48,000				48000
19	FRI	12000				12000
20	SAT					0
21	SUN					0
22	MON	12000				12000
23	TUE	42000				42000
24	WED	30,000				30000
25	THU	6000	24000	ELAM/BRICKER	Elam 1	30000
26	FRI		12000			12000
27	SAT		6000			6000
28	SUN					0
29	MON		12000			12000
30	TUE		12000			12000
31	WED		30000			30000

2019 August: LIQUID APPLICATION						
DATE	DAY	BIOGRO	BIOGRO	APPLICATION SITE	APPLICATION SITE	OPS-SQL GALLONS
1	THU	48000		Elam 1		48000
2	FRI	12000				12000
3	SAT					0
4	SUN					0
5	MON	12,000				12000
6	TUE	24,000				24000
7	WED	12,000				12000
8	THU					0
9	FRI					0
10	SAT					0
11	SUN					0
12	MON	6000				6000
13	TUE	18,000				18000
13	TUE					
14	WED	30,000				30000
15	THU	18,000				18000
16	FRI	12,000				12000
17	SAT					0
18	SUN					0
19	MON	6000		Elam 1		6000
20	TUE	6,000		Orton		6000
21	WED	24000		Orton		24000
22	THU	12000		Orton		12000
23	FRI	6000		Orton		6000
24	SAT					0
25	SUN					0
26	MON	6000		Orton		6000
27	TUE	30000		Orton		30000
28	WED	48,000		Orton		48000
29	THU	42000		Orton		42000

2019 September: LIQUID APPLICATION						
DATE	DAY	BIOGRO	BIOGRO	APPLICATION SITE	APPLICATION SITE	OPS-SQL GALLONS
1	SUN			Orton		0
2	MON	6000				6000
3	TUE	48000				48000
4	WED	24000				24000
5	THU	6000				6000
6	FRI					0
7	SAT					0
8	SUN					0
9	MON	6,000		Orton		6000
10	TUE	18,000				18000
11	WED	18000				18000
12	THU					0
13	FRI					0
14	SAT					0
15	SUN					0
16	MON					0
17	TUE					0
18	WED					0
19	THU	24,000		Orton		24000
20	FRI	24,000				24000
21	SAT					0
22	SUN					0
23	MON					0
24	TUE	48,000				48000
25	WED	36000				36000
26	THU	48,000				48000
27	FRI	12,000				12000
28	SAT					0
29	SUN					0
30	MON	12000				12000
LIQUID GALLONS: Monthly Total						**330,000**

2019 OCTOBER: LIQUID APPLICATION						
DATE	DAY	BIOGRO	BIOGRO	APPLICATION SITE	APPLICATION SITE	OPS-SQL GALLONS
1	TUE	30000		Orton		30000
2	WED					0
3	THU					0
4	FRI					0
5	SAT					0
6	SUN					0
7	MON	18,000		Orton		18000
8	TUE	24000				24000
9	WED	24,000				24000
10	THU	36,000				36000
11	FRI					0
12	SAT					0
13	SUN					0
14	MON					0
15	TUE					0
16	WED					0
17	THU					0
18	FRI					0
19	SAT					0
20	SUN					0
21	MON					0
22	TUE					0
23	WED					0
24	THU					0
25	FRI					0
26	SAT					0
27	SUN					0
28	MON					0
29	TUE					0
30	WED					0
31	THU					0

2019 December: Liquid Transfer to City of Woodburn						
DATE	DAY	BIOGRO	BIOGRO	APPLICATION SITE	APPLICATION SITE	OPS-SQL GALLONS
1	SUN					0
2	MON					0
3	TUE					0
4	WED					0
5	THU					0
6	FRI					0
7	SAT					0
8	SUN					0
9	MON					0
10	TUE					0
11	WED					0
12	THU					0
13	FRI					0
14	SAT					0
15	SUN					0
16	MON					0
17	TUE	26,500		Woodburn		26500
18	WED	42,000				42000
19	THU	54500				54500
20	FRI	53,500				53500
21	SAT					0
22	SUN					0
23	MON	57000				57000
24	TUE	26,000				26000
25	WED					0
26	THU					0
27	FRI	5500				5500
28	SAT					0
29	SUN					0
30	MON					0
31	TUE					0

Section 8: Updated Biosolids Spill Plan

City of Salem
Willow Lake Water Pollution Control Facility
5915 Windsor Island Road North
Salem OR 97302

CITY OF SALEM BIOSOLIDS TRANSPORT SPILL RESPONSE PLAN

BIOGRO™ PROGRAM

Biosolids to Land Application

June 2004
Revised April 2009
Revised January 2011
Revised January 2013
Revised January 2014
Revised February 2015
Revised January 2016
Revised January 2017
Revised January 2018
Revised January 2019

CONTENTS

BIOSOLIDS TRANSPORT SPILL RESPONSE PLAN
INFORMATION SHEET

(It is only necessary to dial the last four digits of a number within the city phone system.)

1.	Facility Name:	Willow Lake Water Pollution Control Facility	
	Facility Ownership:	City of Salem, Oregon (Municipality)	
	Address:	5915 Windsor Island Road North Salem, OR 97303	
2.	Facility Contacts:	Jue Zhao Wastewater Division Manager	503-588-6380
		Mark Stevenson Residuals/Hauled Waste Manager	503-588-6380
3.	Public Works Dispatch:		503-588-6333 503-588-6063
4.	Environmental Services:	Nitin Joshi Environmental Compliance Manager	503-588-6647
5.	City Shops:	503-588-6327	
6.	Risk Management:	Marcus Pitts Risk Manager	503-588-6132
7.	Oregon Department of Environmental Quality (ODEQ):		1-800-542-4011
	Local Address:	4026 Fairview Inductrial Dr. SE Salem, OR 97302	
8.	ODEQ Contact:	Paul Kennedy Natural Resource Specialist	1-541-687-7439

GENERAL INFORMATION

Definition of Material

Biosolids are processed organic residual solids from domestic wastewater treatment, containing nitrogen, phosphorus, potassium, trace metals, and some pathogenic (disease-causing) organisms. Willow Lake Water Pollution Control Facility (WLWPCF) biosolids have undergone several processes to significantly reduce pathogens and reduce volatile solids to the extent that they do not attract vectors.

Biosolids being transported are typically 2 to 3 percent total solids for liquids and 16 to 26 percent total solids for cake. The solids in both liquid and cake material contains 10 percent volatile solids and have a pH between 7 and 8.3.

BIOGRO™ Staffing and Equipment

The City of Salem utilizes plant staff and equipment for local hauling of cake and solids during the months of May through October. During these months, BIOGRO™ staffing consists of two full time positions and a Residuals Manager. Plant operators with proper training and license requirements occasionally assist with local transport during the summer months. Work hours are from 0600 to 1430 hours, Monday through Friday, with occasional overtime during the height of canning season in August and September.

Typically, from mid-October through early June when local application is not possible due to wet field conditions, cake product is transported to a local multi-purpose agricultural building near Turner using plant staff or Groat Bros Inc Transportation services.

BIOGRO™ Loading and Re-fueling Locations

All BIOGRO™ tankers and trailers are loaded exclusively on site at WLWPCF. The North and South Digester Complexes have liquid loading facilities. The Solids Handling Building has a cake hopper loading facility for belt filter press product. The centrifuge has a discharge screw auger which loads directly into the transport trucks. Willow Lake also has a fuel station and all BIOGRO™ equipment is fueled on site.

BIOGRO™ Transport Equipment

The City of Salem owns and operates the following equipment as part of the BIOGRO™ Program. Each BIOGRO™ vehicle carries a portfolio containing vehicle registration, proof of insurance, accident and spill report forms, a Drivers Spill Notification System Flow Chart and a Biosolids Fact Sheet. Each driver carries a cell phone, and additionally, each vehicle is capable of radio communication with Willow Lake Water Pollution Control Facility and City Dispatch and carries emergency equipment for containment and clean-up of small spills.

LIQUID TRANSPORT EQUIPMENT

Tractors	ID Number	Tankers	ID Number
Freightliner	11430	Beall Trans-liner 6,000 gallons each	
	11104		370
	9973		371
	9974		372

CAKE TRANSPORT EQUIPMENT

Tractors	ID Number	Trailer	ID Number
Freightliner Freightliner	11104 11430	Ravens Semi-End Dump Trailer Approximately 22 wet tons semi-solid product capacity	9703
Freightliner	9974	Waren Semi-End Ejector Trailer Approximately 20 wet tons semi-solid product capacity	10967

BIOGRO™ ROUTE DESCRIPTION

General

Due to the number of application sites, individual route descriptions are impractical to record in the context of the Biosolids Spill Plan. However, route descriptions for all application sites are on file in the Residuals Manager's office at WLWPCF. When applying to local sites, the worksheet for the current site is posted on the board in the BIOGRO™ office. Additionally, BIOGRO™ drivers carry a route description when transporting biosolids to application sites.

Standard Route

Upon leaving WLWPCF, the route is standard for the first several miles. Most application sites lie to the north, south, or east of Willow Lake. The following directions describe the initial route of transport vehicles.

- Turn south from WLWPCF driveway onto Windsor Island Road N.

- Turn east (about two blocks) onto Lockhaven Drive.
  Most sites can be reached from the following routes.

  A. NORTHBOUND SITES can be accessed by turning north onto River Road, Interstate 5, or Highway 99.

  B. SOUTHBOUND SITES can be accessed by turning south onto Interstate 5, or Cordon Road.

  C. EASTBOUND SITES can be accessed by continuing east on Lockhaven Road, which turns into Hazelgreen Road at Highway 99.

IDENTIFICATION OF SENSITIVE AREAS

General

BIOGRO™ liquid and cake products are transported from WLWPCF to various application sites within close proximity to the plant. There are no sensitive areas on the roads described in the Standard Route Description.

IDENTIFICATION OF NATURAL HAZARD AREAS

General

There are no natural hazard areas resulting from inclement weather, along the roads described in the Standard Route Description. The BIOGRO™ hauling program typically runs from May 1 through October 31, Monday through Friday from 0600 - 1430 hours.

Individual application site route descriptions include identification of sensitive areas and natural hazard areas. **Drivers discuss these areas of concern and carry route descriptions when transporting to any application site.**

BIOSOLIDS SPILL NOTIFICATION SYSTEM

General

The Biosolids Spill Notification System is initiated by the driver using either the cell phone or radio communication. If the spill can be cleaned up by the driver, he must contact the Residuals Manager, if available, or as soon as possible afterwards, and inform him of the spill. He must clean up the spill properly and take all materials back to the WLWPCF with the vehicle.

If the spill cannot be cleaned up by the driver, he will contact Dispatch requesting additional equipment and assistance. Dispatch will notify various city departments for the necessary response personnel and equipment. Additionally, Dispatch will relay information concerning the spill to the Residuals Manager, or if unavailable, the Wastewater Treatment Services Manager, or an Operations Shift Supervisor at WLWPCF. *Use the Spill Notification System Flow Chart: Driver Response*.

Every spill, regardless of size or location, shall be considered large enough to initiate the Spill Response Program. A Spill Notification Report Form must be filled out.

If Spill Can Be Contained and Cleaned up by the Driver

- Immediately notify the Residuals Manager. *Use the Spill Notification System Flow Chart: Driver Response*.

- Clean up the spill. Biosolids should be thoroughly removed so that no significant residues remain to be washed into any storm drain or waterway by surface water. Each BIOGRO™ truck is equipped with a shovel and lime for disinfection. Biosolids should be scraped from the surface with a flat edged shovel. Lime should be applied to the spill site for disinfection.

- If the spill is contained on a paved surface, park the truck on the side of the road. Place reflectors and divert traffic around the spill. Any material remaining on the pavement should be absorbed into a compatible material such as sand, diatomaceous earth, or soil.

- If the spill is on the earth's surface, all contaminated dirt should be collected as well. All spilled biosolids must be returned to the BIOGRO™ transport vehicle from which they spilled, or be loaded into another appropriate transport vehicle and returned to WLWPCF.

- Continue the trip if possible, without additional spillage.

- Complete Spill Notification Report Form after returning to WLWPCF.

If Spill *Can Not* Be Contained & Cleaned up by The Driver

- Immediately notify Dispatch via cell phone or truck radio.
- *Use the Spill Notification System Flow Chart: Driver Response*.

- Warn pedestrians and motorists to stay away from the spill area. Direct traffic, if necessary, until police or fire personnel arrive.

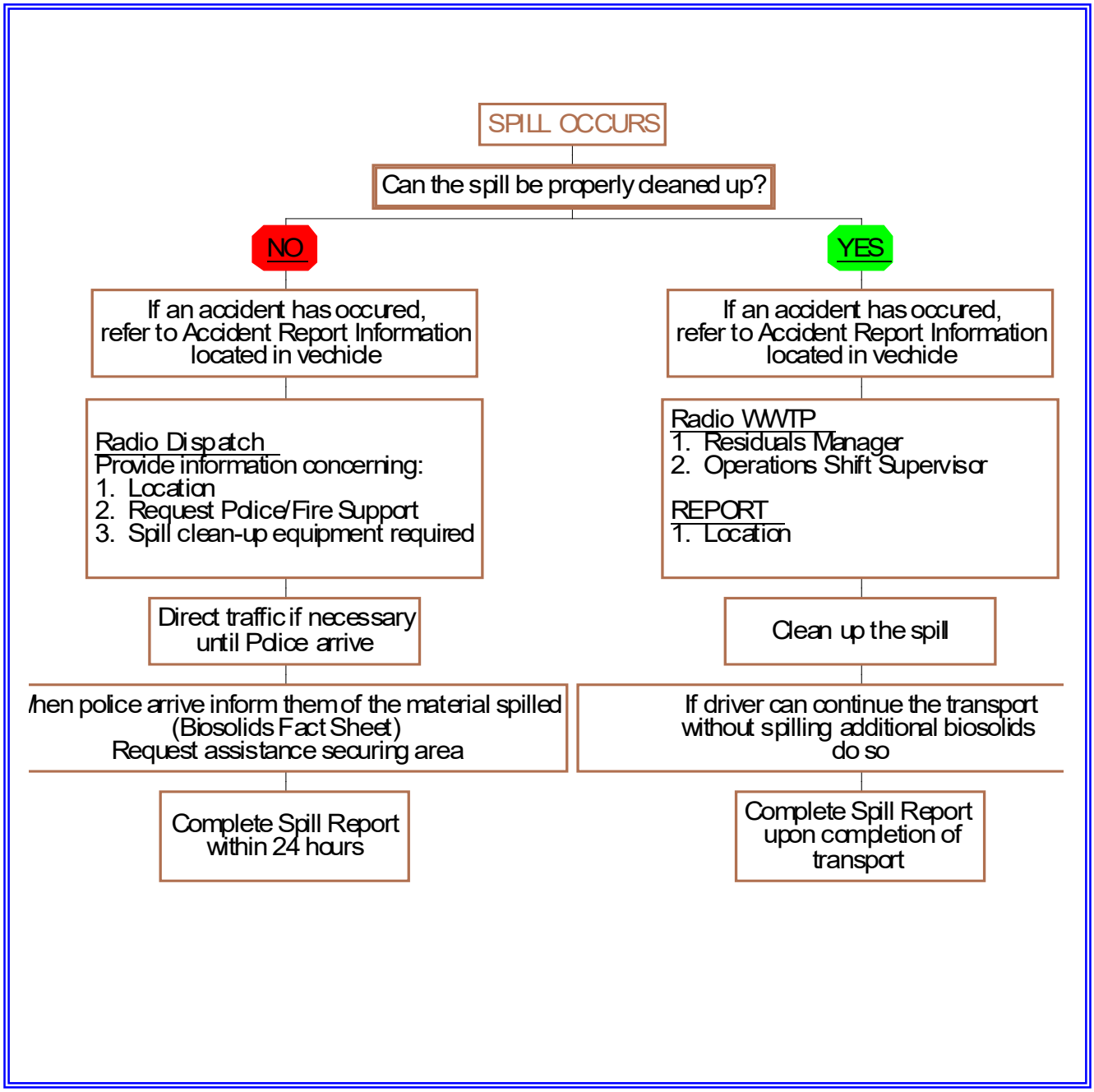
- Inform police or fire personnel of the type of material (Biosolids Fact Sheet) that has been spilled. Request the area to be secured and protected to prevent property damage and personal injury.

- When fire or police personnel can protect area, report back with Residuals Manager.

- Complete Spill Notification Report Form after returning to WLWPCF.

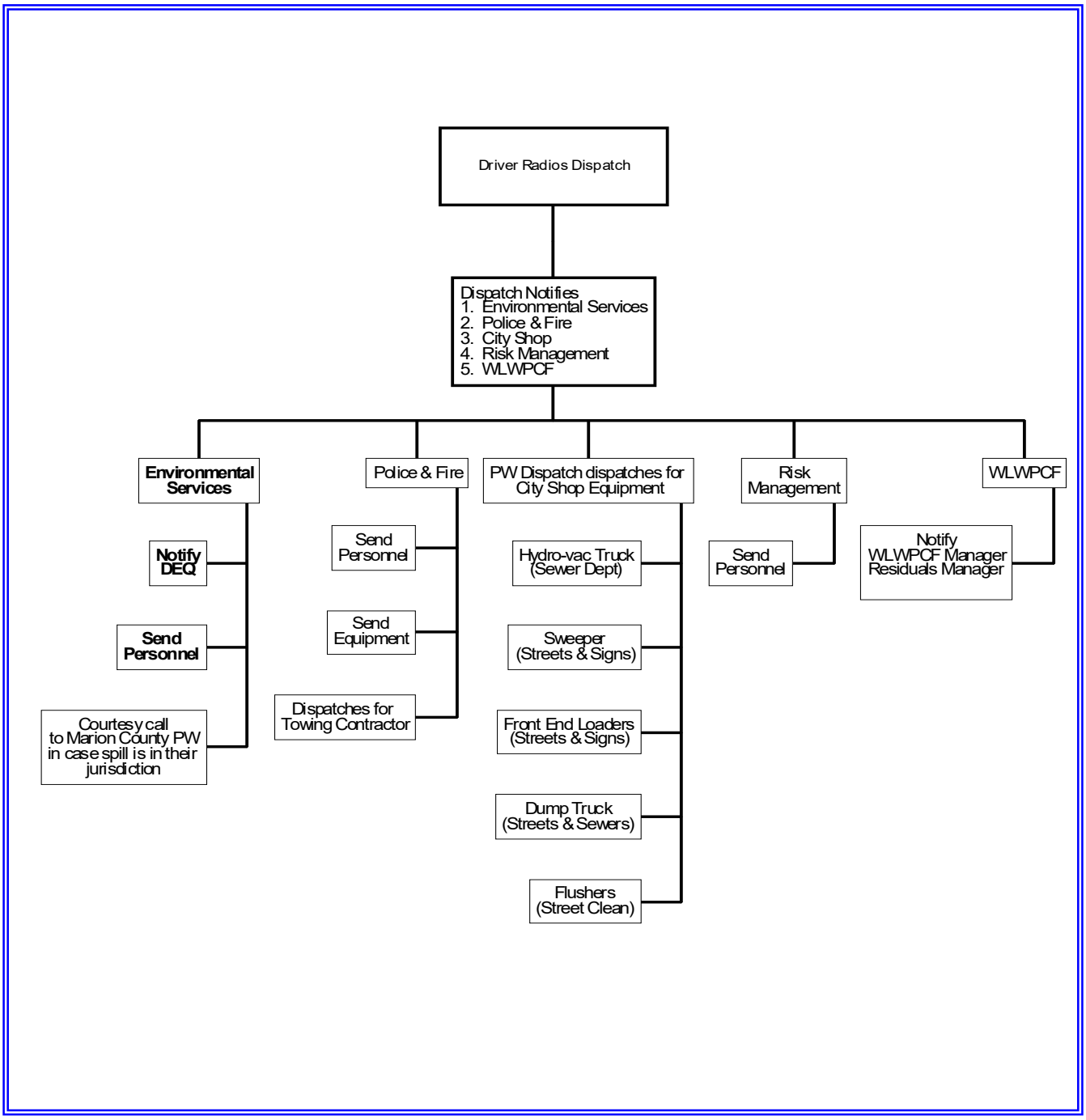
BIOSOLIDS SPILL NOTIFICATION SYSTEM

DRIVER RESPONSE



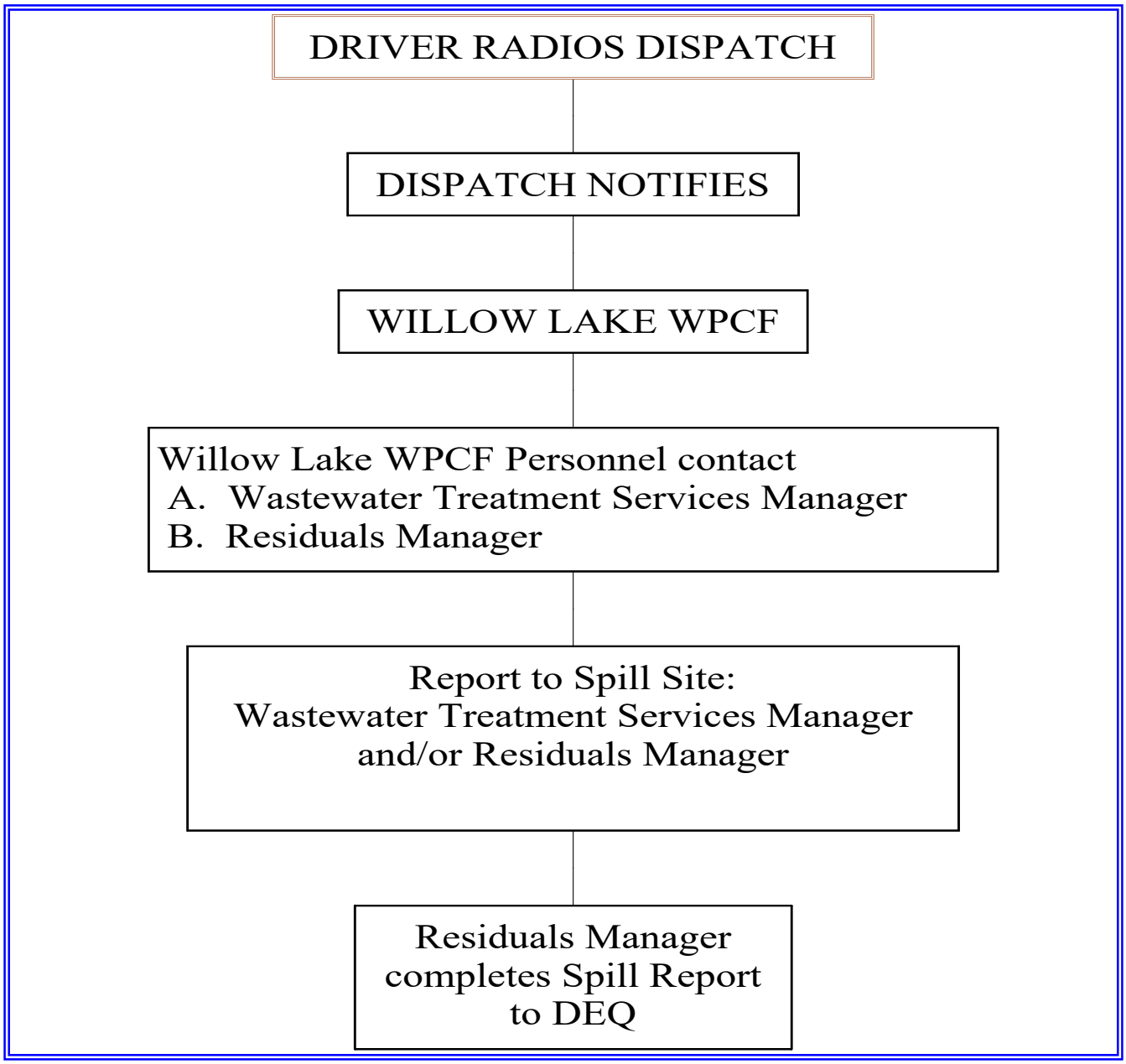
BIOSOLIDS SPILL NOTIFICATION SYSTEM

DISPATCH RESPONSE



BIOSOLIDS SPILL NOTIFICATION SYSTEM

WLWPCF RESPONSE



BIOSOLIDS FACT SHEET

DESCRIPTION:

Biosolids are biologically stabilized residuals derived from secondary treatment of domestic wastewater by the City of Salem's WLWPCF .
These residuals have undergone anaerobic digestion, a controlled process recognized by the Environmental Protection Agency (EPA) and Department of Environmental Quality (DEQ) to make them suitable for transportation and land application. Digestion processes and Biosolids quality is regularly monitored to assure Federal and State pathogen reduction {(40) CFR, part 503.13 (b)(3) & OAR 340-50-26 (2)(b)}, vector attraction {40 CFR part 503.13 (b)(1) & OAR 340-50-26 (2)(c)}, and trace metal pollutants {40 CFR 503.13 (b)(1) & 340-50-026 (2)(a)}levels are within regulatory standards.

The DEQ and EPA actively promote Biosolids recycling via land application. The City of Salem's Biosolids are a recyclable material which improves soil tilth, fertility and stability.

Information on the City of Salem's Biosolids is available upon request from WLWPCF at 503-588-6380.

HANDLING AND PPE REQUIREMENTS:

WLWPCF Biosolids present little threat to hauler or public health and safety. The potential exists for disease-causing microorganisms to remain in the solids transported from the WLWPCF to the land application site. The following Safety Practices shall be observed to minimize exposure:

1. Wash hands before eating, drinking, or smoking.
2. Use waterless disinfectant soap for washing hands when water is not available.
3. Avoid rubbing eyes, nose and mouth after handling or unloading Biosolids.
4. Do not eat, drink, or smoke while loading or unloading Biosolids.
5. Wear gloves during loading and unloading of Biosolids.
6. Wear protective clothing when there is to be more than causal contact with the Biosolids.
7. When clothing or body parts are exposed to Biosolids, wash skin with soap and water, change clothing before leaving the area.
8. Clean and disinfect all cuts or scrapes. Keep wounds protected from contamination.

HAZARDS:

WLWPCF Biosolids are not considered RCRA subtitle C hazardous waste nor are they toxic, biological or radioactive waste. In the event of a spill, call the City of Salem Dispatch at 503-589-2190, or WLWPCF at 503-588-6380.

BIOSOLIDS SPILL NOTIFICATION REPORT FORM

Date _____ Time _____ Name _____

Spill Discovered By: Name _____

Date _____ Time _____

Spill Reported To: (Please put the date/time/initials by those titles that apply)

_____ Dispatch

_____ Residuals Manager _____Wastewater Treatment Services Manager

_____Operations Shift Supervisor _____ Risk Management _____DEQ

Spill Information:

Spill Date _____ Spill Time _____

Spill Clean-up Date _____ Spill Clean-up Time _____

Spill Type: Cake _____ Liquid_____

Amount _____

Location _____

Cause _____

_____

Action(s) Taken_____

_____

_____

LOCATION, TYPE, AND AVAILABILITY OF RESOURCES

General

In the event of a biosolids spill that cannot be cleaned up by the driver, the initial request for equipment, personnel and materials will be made by the driver through Dispatch, who will then contact the WLWPCF Manager and Residuals Manager and forward all necessary information. Various other city departments will be notified as needed or requested for response equipment and personnel.

Response Equipment

The City of Salem's equipment is centrally located at the City Shops and includes:

- Hydro-vac Trucks
- Sweepers
- Flushers
- Dump Trucks
- Loaders

Materials

WLWPCF maintains an inventory of bagged lime on site for emergencies.

Personnel

City personnel assisting in clean up and traffic control would include:

- Environmental Services Personnel
- Risk Management Personnel
- Police and Fire
- Equipment Operators
- WLWPCF Manager
- Residuals Manager

CONTRACTED TRANSPORT COMPANY'S SPILL RESPONSE PLAN(S)

The following contractors have provided Spill Response Plans as part of their contract requirements. These Plans have been reviewed and are currently filed at WLWPCF.

- Groat Bros Inc. Woodburn, Washington