



Water and Waste
Eaux et déchets

ENVIRONMENTAL STANDARDS DIVISION

2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL, AND MASTER PLAN UPDATE



ENVIRONMENT ACT LICENCE #1089E RR

January 2021



**Water and Waste
Eaux et déchets**

Manitoba Conservation and Climate
Environmental Compliance and Enforcement Branch
1007 Century Street
Winnipeg, MB R3H 04W

January 29, 2021

Attention: Ms. Kristal Harman, Director

RE: 2020 ANNUAL COMPLIANCE REPORT - ENVIRONMENT ACT LICENCE 1089E RR

Please find enclosed the City of Winnipeg's 2020 Biosolids Dewatering, Monitoring, Disposal and Master Plan Update Report in accordance with Environment Act Licence No. 1089E RR.

Included in this report are details of the:

- a) 2020 biosolids distribution and monitoring programs
- b) proposed 2021 biosolids distribution and monitoring programs
- c) activities undertaken as part of the Biosolids Master Plan

Please let me know of any concerns or questions respecting this submission. I may be reached by telephone at 204-986-8359 or by e-mail at rgrosselle@winnipeg.ca.

Yours sincerely,

*Original signed by R. Grosselle:
(Signed original available upon request)*

R. Grosselle
Manager of Environmental Standards

Enclosures

cc: M.L. Geer, CPA, CA (email)
G.K. Patton, P. Eng. (email)
C. Carroll, P. Eng. (email)
M. Gordichuk, CCLP (email)



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**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
AND MASTER PLAN UPDATE**

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AND MASTER PLAN UPDATE**

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JANUARY 2021



**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
AND MASTER PLAN UPDATE**

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**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
AND MASTER PLAN UPDATE**

1.0 INTRODUCTION

Environment Act Licence (EAL) #1089E RR, issued on June 14, 2000, requires that the City of Winnipeg monitor its biosolids dewatering and disposal operations and submit a report to the regulating authority and various municipalities on or before the 31st of January of each year.

Biosolids are an end product of sewage treatment; they are created when solids and sludge that are separated from wastewater are digested and dewatered. They are rich in nutrients and also contain metals and trace amounts of minerals.

Historically, the City of Winnipeg's biosolids were spread on agricultural fields to act as a fertilizer under a program known as WinGRO. In 2011, the allowable biosolids application rates were reduced. The existing WinGRO equipment could not operate at the reduced rates, and the program was discontinued as a result. From 2011 to 2014, all biosolids produced at the City of Winnipeg's North End Pollution Control Centre (NEWPCC) were disposed of at the Brady Road Resource Management Facility (BRRMF).

In 2014, the City of Winnipeg developed a Biosolids Master Plan¹ (BMP), a 30 year plan for maximizing the recovery and beneficial reuse of the nutrients contained in biosolids.

This report summarizes the results of the City's 2020 Biosolids Dewatering, Monitoring, and Disposal Program, and provides an update of activities taken in 2020 under the BMP.

**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
AND MASTER PLAN UPDATE**

2.0 BIOSOLIDS COMPOSITION AND DISTRIBUTION

From January 1, 2020 to December 31, 2020 the City produced 54,979 wet tonnes of anaerobically digested, mechanically-dewatered biosolids at the NEWPCC; the total solids in the biosolids averaged $24.9 \pm 2.4\%$ (n = 256). The dewatering equipment achieved a total solids content of at least 20 percent by weight in the biosolids, except on February 27, and December 23, 30 and 31, when process issues with the centrifuges allowed us to achieve a total solids content of 19.7%, 19.9%, 19.9% and 19.7% respectively.

Of the 54,979 wet tonnes of biosolids produced in 2020, approximately 1,219 wet tonnes were composted at the BRRMF, 25,860 wet tonnes were used in the Summit Landfill soil fabrication pilot project, 11,175 wet tonnes were applied to agricultural land, and 16,725 wet tonnes were disposed of at the BRRMF. The temporary storage facility in the RM of West St. Paul was not used to provide interim storage for mechanically-dewatered biosolids in 2020 and will not be used for biosolids storage in 2021.

The 2015-2020 Biosolids Distributions are shown in Figure 1, Table 1 contains analytical results for 2020 biosolids samples, and Appendix I contains the Monthly Hauling Summaries for 2020.

FIGURE 1: 2015-2020 BIOSOLIDS DISTRIBUTIONS

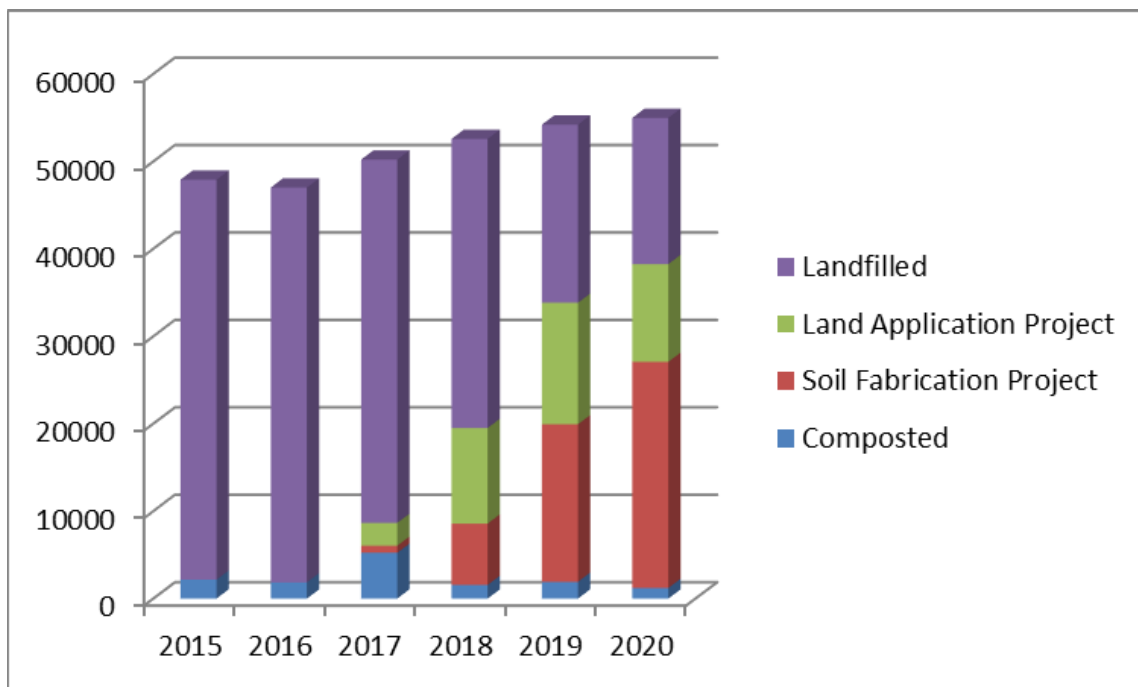


TABLE 1
2020 Biosolids Quality

Sample Number	Date Sampled *	Total Cd (mg/Kg-Cd)	Total Cr (mg/Kg-Cr)	Total Cu (mg/Kg-Cu)	Total Ni (mg/Kg-Ni)	Total Pb (mg/Kg-Pb)	Total Zn (mg/Kg-Zn)	Total P (mg/Kg-P)	NH3-N (mg/Kg-N)	TKN (mg/Kg-N)	pH (units)	Specific Conductance (uS/cm)	Moisture (%)
1	22-Dec-19	2.9	74	303	33.1	35.3	985	27,800	10,650	43,800	5.81	10,500	76.6
2	6-Jan-20	5.0	75	709	35.3	39.2	1,076	35,070	9,830	29,000	5.77	10,500	76.9
3	20-Jan-20	4.9	66	677	31.4	43.2	1,008	35,070	9,342	44,600	5.65	9,070	75.1
4	3-Feb-20	3.0	59	564	27.3	47.2	1,437	28,090	8,045	46,700	5.48	8,660	73.5
5	18-Feb-20	2.6	72	588	29.1	40.8	1,937	30,450	9,661	40,200	5.55	9,340	75.6
6	2-Mar-20	2.6	87	859	33.3	40.9	1,630	34,080	9,026	24,300	5.68	9,370	75.3
7	16-Mar-20	2.2	75	593	32.0	37.4	1,103	30,730	7,798	31,000	5.69	8,830	74.8
8	30-Mar-20	4.3	70	520	31.7	46.3	940	25,450	7,709	29,700	5.61	7,850	71.4
9	14-Apr-20	3.5	47	424	22.7	42.5	667	19,820	7,436	32,100	5.89	9,150	71.6
10	27-Apr-20	2.8	62	446	23.6	37.7	697	18,250	7,530	35,600	6.16	8,750	72.0
11	11-May-20	2.4	79	521	24.0	35.4	765	18,750	7,513	39,200	6.19	9,410	73.8
12	25-May-20	2.2	117	524	25.3	38.5	791	18,020	9,045	39,300	6.05	9,200	74.1
13	8-Jun-20	1.6	110	504	24.6	34.1	883	16,360	8,705	38,500	5.97	8,960	74.3
14	22-Jun-20	0.6	77	355	20.2	34.2	958	11,110	7,477	28,500	5.98	7,460	70.5
15	6-Jul-20	0.6	96	475	39.7	35.9	731	14,740	6,163	33,300	5.98	8,000	73.1
16	20-Jul-20	1.2	69	399	44.0	30.1	927	12,170	8,775	31,900	5.91	8,690	73.6
17	4-Aug-20	1.7	87	592	95.6	42.4	1,104	20,430	8,968	40,800	6.22	8,860	75.1
18	17-Aug-20	1.8	81	547	68.6	45.3	1,101	19,420	8,490	34,500	5.95	10,300	75.9
19	31-Aug-20	1.6	77	607	54.7	43.5	1,042	19,780	7,163	29,300	6.02	8,920	76.2
20	14-Sep-20	2.0	81	647	55.1	48.0	1,025	23,150	10,650	28,400	6.02	10,800	78.4
21	28-Sep-20	3.1	104	380	51.0	50.6	1,125	22,970	12,410	49,800	6.24	10,500	78.4
22	13-Oct-20	2.5	107	423	42.7	45.8	1,209	22,880	11,840	43,100	5.96	11,600	77.5
23	26-Oct-20	2.8	118	438	46.7	50.5	4,552	29,250	11,030	45,700	5.94	9,950	77.2
24	9-Nov-20	1.9	76	401	32.9	36.5	2,286	23,420	5,857	43,200	6.01	10,200	76.0
25	23-Nov-20	1.5	69	637	53.0	32.4	1,478	22,250	9,169	44,600	5.98	10,400	77.0
26	7-Dec-20	1.7	69	627	46.8	31.6	1,367	21,470	11,140	43,100	5.97	10,400	78.2
27	21-Dec-20	1.8	65	620	40.2	36.5	1,216	20,680	9,695	49,000	6.33	9,950	80.0
Average:		2.4	80	533	39.4	40.1	1,261	23,024	8,930	37,748	5.93	9,467	75.3
Maximum:		5.0	118	859	95.6	50.6	4,552	35,070	12,410	49,800	6.33	11,600	80.0
Minimum:		0.6	47	303	20.2	30.1	667	11,110	5,857	24,300	5.48	7,460	70.5

* Indicates starting date for year 2020 biweekly composite samples

**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
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3.0 BENEFICIAL REUSE OF BIOSOLIDS

a) BIOSOLIDS STORAGE AND LAND APPLICATION

The City conducted a three-year (2018-2020) full scale Biosolids Land Application program in the RMs of Rosser and Macdonald. The year 2020 marked the third year of the full-scale Program.

On May 25, 2020, Manitoba Conservation and Climate (MCC), Environmental Approvals Branch (EAB) approved the City's Notice of Alteration (NOA) for Environment Act License (EAL) No. 1089E RR for the temporary in-field storage and land application of up to 20,000 wet tonnes of biosolids onto three fields of agricultural land within the RM of Macdonald in 2020. The submission of an annual NOA is an interim measure while the EAL application for a new in-field biosolids storage and land application program is under review by the EAB.

Between July 22 and October 12, biosolids were stockpiled at one in-field storage site, which had a straw bed and berm for leachate management. Straw was applied over the biosolids each evening after deliveries to cap the biosolids and ensure odour and vector control. A total of 11,175 wet tonnes of biosolids materials were applied to the three fields at an approximate rate of 46 wet tonnes per hectare, based on soil samples collected post crop harvest on September 4 and October 1. The 2020 target of 20,000 wet tonnes of biosolids was not met because the startup of the season was delayed due to available land and program interruptions.

Odour assessments were completed on four separate dates at the stockpile site, with odours being classified as annoying to very annoying. Odour assessments at mile road sites were completed one-day post application to assess odour levels that may be experienced by neighbors during land application. The highest odour level was recorded at locations adjacent to application fields and was classified as annoying. The RM of Macdonald Reeve and Council did not receive any complaints about odours during the 2020 program and the City did not receive any odour concerns from the public through the project phone number or email address.

In 2020, soil samples were collected from fields that received biosolids in 2017, 2018, and 2019; the results were consistent with post crop harvest results for nitrogen and phosphorus within heavy clay soils.

A detailed description of the project, including analytical results, is found in The City of Winnipeg Biosolids Land Application Program Summary Report², which will be submitted to MCC in March/April 2021.

**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
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b) SOIL FABRICATION

The City of Winnipeg is conducting a four-year (2018-2021) soil fabrication pilot project at the Summit Landfill.

In 2020, approximately 25,860 wet tonnes of biosolids were mixed with wood chips and street sweepings to produce fabricated soil, which was used to complete the cap system at Summit Landfill.

Although odours were noted locally during receiving operations, they were reduced after mixing the biosolids with woodchips and street sweepings. No odours were detected offsite during the biosolids receiving or soil spreading operations and no odour complaints were received through 311 or other public sources. There were no dust, noise, vector, or nuisance concerns during operations.

Samples of runoff water collected upstream and downstream of the fabricated soil plots were compared to samples collected downstream of a control plot; there is no clear correlation that the fabricated soil directly impacted surface water quality.

Composite samples were taken from various points within the plots where the fabricated soil was spread in 2018 and 2019; the analytical results met the Canadian Council of Ministers of the Environment (CCME) Recommended Canadian Soil Quality Guidelines for Industrial uses. The fabricated soil has been shown to support the vegetative growth of native prairie grass, even in dry summer conditions.

In 2021, the target is to use approximately 28,000 wet tonnes of biosolids in the soil fabrication pilot project. The fourth year of the project will include spreading and seeding operations and environmental monitoring including: surface water, soil, and vegetation monitoring and analysis.

A detailed description of the 2020 project and findings are found in the Summit Landfill Soil Fabrication Pilot Project Year Three Annual Report³, which will be submitted to Manitoba Conservation and Climate (MCC) in March 2021; the final report will be submitted by June 30, 2021.

**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
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c) COMPOST

The City of Winnipeg conducted a pilot biosolids composting program from 2015 to 2018, which produced a low odour, nutrient rich compost with low metals content. The City of Winnipeg Biosolids Compost Pilot Report⁴ provides a detailed description of the project. An NOA to the BRRMF EAL 3081R allows for ongoing operational biosolids composting.

In 2020, 1,219 wet tonnes of biosolids were diverted to the compost facility. Bio-filters on the biosolids compost facility are used to control odours; none of the 21 odour complaints reported for the BRRMF in 2020 were attributed specifically to biosolids.

In 2021, biosolids composting will continue on an as-needed basis to meet final cover needs at the BRRMF.

d) LANDFILL DISPOSAL

Of the 54,979 wet tonnes biosolids produced in 2020, approximately 16,725 wet tonnes were disposed at the BRRMF, which is not considered a beneficial reuse of nutrients.

We continue to monitor odours at the BRRMF on a weekly basis and follow up with any odour complaints. Odour mitigation strategies for biosolids have largely been successful as none of the 21 odour complaints reported in 2020 were attributed specifically to biosolids. The City continues to use strategies to help mitigate odours including:

- Covering biosolids quickly with soil or other wastes that do not cause odours
- Scheduling the arrival of biosolids at specific times of day when wind conditions are not likely to cause concern for odour
- Collecting and burning landfill gas to help mitigate buried biosolid odours
- Controlling storm water runoff to prevent leachate generation and ponding of water that causes odour
- Using compost near odour point sources to help control odour
- Using woodchips in the biosolids trench to help mitigate odour when spreading biosolids

In 2021, biosolids that are not composted, land applied, or used in the soil fabrication project will be disposed of at the BRRMF.

**2020 BIOSOLIDS DEWATERING, MONITORING, DISPOSAL,
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4.0 ADDITIONAL ACTIVITIES UNDER THE BIOSOLIDS MASTER PLAN

An application has been submitted for Provincial and Federal funding for a new digestion facility with thermal hydrolysis pre-treatment at the NEWPCC, which has been ranked as the City of Winnipeg's #1 infrastructure project. Updates pertaining to design and construction of the new digestion facility will be reported to MCC in the bi-annual NEWPCC Master Plan Reports.

5.0 REFERENCES

1. COW/Veolia. September 2014. City of Winnipeg Biosolids Master Plan
2. WSP. January 2021. (Draft) City of Winnipeg Biosolids Land Application Program Summary Report
3. COW. January 2021. (Draft) Summit Landfill Soil Fabrication Pilot Project Year Three Annual Report
4. COW. October 2018. City of Winnipeg Biosolids Compost Pilot Report

APPENDIX I
MONTHLY HAULING SUMMARIES



2020 Biosolids Management Program

January 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1												
2	290.84	21.50	62.53	12	0	0	0	12	290.84	0.00	0.00	0.00
3	338.80	23.50	79.62	14	0	0	0	14	338.80	0.00	0.00	0.00
4												
5												
6	241.02	24.45	58.93	10	0	0	0	10	241.02	0.00	0.00	0.00
7	218.30	25.05	54.68	9	0	0	0	9	218.30	0.00	0.00	0.00
8	246.10	24.32	59.85	10	0	0	0	10	246.10	0.00	0.00	0.00
9	239.65	23.45	56.20	10	0	0	0	10	239.65	0.00	0.00	0.00
10	172.63	25.70	44.37	7	0	0	0	7	172.63	0.00	0.00	0.00
11												
12												
13	312.67	22.35	69.88	13	0	0	0	13	312.67	0.00	0.00	0.00
14	189.35	24.32	46.05	8	0	0	0	8	189.35	0.00	0.00	0.00
15	168.09	23.80	40.01	7	0	0	0	7	168.09	0.00	0.00	0.00
16	192.19	22.35	42.95	8	0	0	0	8	192.19	0.00	0.00	0.00
17	239.95	24.15	57.95	10	0	0	0	10	239.95	0.00	0.00	0.00
18												
19												
20	144.20	26.15	37.71	0	6	0	0	6	0.00	144.20	0.00	0.00
21	239.80	25.75	61.75	0	10	0	0	10	0.00	239.80	0.00	0.00
22	191.55	24.30	46.55	0	8	0	0	8	0.00	191.55	0.00	0.00
23	238.26	24.00	57.18	0	10	0	0	10	0.00	238.26	0.00	0.00
24	190.94	24.32	46.44	0	8	0	0	8	0.00	190.94	0.00	0.00
25												
26												
27	240.41	24.32	58.47	0	10	0	0	10	0.00	240.41	0.00	0.00
28	191.67	24.70	47.34	0	8	0	0	8	0.00	191.67	0.00	0.00
29	191.61	24.50	46.94	0	8	0	0	8	0.00	191.61	0.00	0.00
30	239.56	25.70	61.57	0	10	0	0	10	0.00	239.56	0.00	0.00
31	210.59	26.40	55.60	0	9	0	0	9	0.00	210.59	0.00	0.00
TOTAL	4928.18	24.32	1192.56	118	87	0	0	205	2849.59	2078.59	0.00	0.00



February 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1												
2												
3	264.41	26.05	68.88	0	11	0	0	11	0.00	264.41	0.00	0.00
4	143.94	27.05	38.94	0	6	0	0	6	0.00	143.94	0.00	0.00
5	311.28	26.55	82.64	0	13	0	0	13	0.00	311.28	0.00	0.00
6	192.00	24.75	47.52	0	8	0	0	8	0.00	192.00	0.00	0.00
7	167.91	26.95	45.25	0	7	0	0	7	0.00	167.91	0.00	0.00
8												
9												
10	192.12	26.10	50.14	0	8	0	0	8	0.00	192.12	0.00	0.00
11	239.57	25.34	60.71	0	10	0	0	10	0.00	239.57	0.00	0.00
12	167.63	27.00	45.26	0	7	0	0	7	0.00	167.63	0.00	0.00
13	214.57	24.75	53.11	0	9	0	0	9	0.00	214.57	0.00	0.00
14	168.39	26.30	44.29	0	7	0	0	7	0.00	168.39	0.00	0.00
15	95.95	25.34	24.31	0	4	0	0	4	0.00	95.95	0.00	0.00
16												
17												
18	239.77	25.80	61.86	0	10	0	0	10	0.00	239.77	0.00	0.00
19	239.69	25.60	61.36	0	10	0	0	10	0.00	239.69	0.00	0.00
20	233.33	25.75	60.08	0	10	0	0	10	0.00	233.33	0.00	0.00
21	118.47	25.80	30.57	0	5	0	0	5	0.00	118.47	0.00	0.00
22												
23												
24	240.51	25.55	61.45	0	10	0	0	10	0.00	240.51	0.00	0.00
25	239.66	25.30	60.63	0	10	0	0	10	0.00	239.66	0.00	0.00
26	191.76	21.75	41.71	0	8	0	0	8	0.00	191.76	0.00	0.00
27	163.88	19.70	32.28	0	7	0	0	7	0.00	163.88	0.00	0.00
28	96.00	25.34	24.33	0	4	0	0	4	0.00	96.00	0.00	0.00
29												
TOTAL	3920.84	25.34	995.32	0	164	0	0	164	0.00	3920.84	0.00	0.00



2020 Biosolids Management Program

March 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1												
2	168.49	23.45	39.51	0	7	0	0	7	0.00	168.49	0.00	0.00
3	240.74	24.85	59.82	0	10	0	0	10	0.00	240.74	0.00	0.00
4	241.78	22.80	55.13	0	10	0	0	10	0.00	241.78	0.00	0.00
5	263.74	24.90	65.67	0	11	0	0	11	0.00	263.74	0.00	0.00
6	266.85	25.30	67.51	0	11	0	0	11	0.00	266.85	0.00	0.00
7												
8												
9	337.48	25.45	85.89	0	14	0	0	14	0.00	337.48	0.00	0.00
10	239.96	25.15	60.35	0	9	0	0	9	0.00	239.96	0.00	0.00
11	336.01	23.65	79.47	0	14	0	0	14	0.00	336.01	0.00	0.00
12	287.78	25.16	72.41	0	12	0	0	12	0.00	287.78	0.00	0.00
13	191.50	25.16	48.18	0	8	0	0	8	0.00	191.50	0.00	0.00
14												
15												
16	288.78	26.05	75.23	0	12	0	0	12	0.00	288.78	0.00	0.00
17	313.11	27.35	85.64	0	13	0	0	13	0.00	313.11	0.00	0.00
18	238.24	25.55	60.87	0	10	0	0	10	0.00	238.24	0.00	0.00
19	288.94	25.10	72.52	0	12	0	0	12	0.00	288.94	0.00	0.00
20	191.91	26.30	50.47	0	8	0	0	8	0.00	191.91	0.00	0.00
21												
22												
23	288.12	23.20	66.84	0	12	0	0	12	0.00	288.12	0.00	0.00
24	288.18	26.60	76.66	0	12	0	0	12	0.00	288.18	0.00	0.00
25	288.06	24.65	71.01	0	12	0	0	12	0.00	288.06	0.00	0.00
26	284.82	24.90	70.92	0	12	0	0	12	0.00	284.82	0.00	0.00
27	312.91	24.45	76.51	0	13	0	0	13	0.00	312.91	0.00	0.00
28												
29												
30	263.87	28.40	74.94	0	11	0	0	11	0.00	263.87	0.00	0.00
31	167.45	25.16	42.13	0	7	0	0	7	0.00	167.45	0.00	0.00
TOTAL	5788.72	25.16	1457.67	0	240	0	0	240	0.00	5788.72	0.00	0.00



2020 Biosolids Management Program

April 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1	287.10	28.17	80.88	0	12	0	0	12	0.00	287.10	0.00	0.00
2	286.75	29.10	83.44	0	12	0	0	12	0.00	286.75	0.00	0.00
3	215.60	29.83	64.31	0	9	0	0	9	0.00	215.60	0.00	0.00
4												
5												
6	476.52	27.15	129.38	0	20	0	0	20	0.00	476.52	0.00	0.00
7	187.13	29.15	54.55	0	8	0	0	8	0.00	187.13	0.00	0.00
8	166.74	29.25	48.77	0	7	0	0	7	0.00	166.74	0.00	0.00
9	191.48	27.70	53.04	0	8	0	0	8	0.00	191.48	0.00	0.00
10	161.03	28.36	45.67	0	0	0	7	7	0.00	0.00	0.00	161.03
11												
12												
13	239.65	28.36	67.96	0	0	0	10	10	0.00	0.00	0.00	239.65
14	143.99	28.65	41.25	0	0	0	6	6	0.00	0.00	0.00	143.99
15	311.75	27.75	86.51	0	0	0	13	13	0.00	0.00	0.00	311.75
16	311.19	26.27	81.75	0	0	0	13	13	0.00	0.00	0.00	311.19
17	239.50	28.95	69.34	0	0	0	10	10	0.00	0.00	0.00	239.50
18												
19												
20	211.37	25.10	53.05	9	0	0	0	9	211.37	0.00	0.00	0.00
21	284.50	26.70	75.96	12	0	0	0	12	284.50	0.00	0.00	0.00
22	281.48	28.85	81.21	12	0	0	0	12	281.48	0.00	0.00	0.00
23	141.60	28.80	40.78	6	0	0	0	6	141.60	0.00	0.00	0.00
24	210.60	29.80	62.76	9	0	0	0	9	210.60	0.00	0.00	0.00
25												
26												
27	238.83	28.36	67.73	10	0	0	0	10	238.83	0.00	0.00	0.00
28	234.76	29.57	69.42	10	0	0	0	10	234.76	0.00	0.00	0.00
29	307.71	29.00	89.24	13	0	0	0	13	307.71	0.00	0.00	0.00
30	185.00	29.07	53.78	8	0	0	0	8	185.00	0.00	0.00	0.00
TOTAL	5314.28	28.36	1500.78	89	76	0	59	224	2095.85	1811.32	0.00	1407.11



May 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1	140.77	29.20	41.10	6	0	0	0	6	140.77	0.00	0.00	0.00
2												
3												
4	282.30	26.89	75.91	12	0	0	0	12	282.30	0.00	0.00	0.00
5	211.90	28.70	60.82	9	0	0	0	9	211.90	0.00	0.00	0.00
6	233.59	24.50	57.23	10	0	0	0	10	233.59	0.00	0.00	0.00
7	117.11	28.55	33.43	5	0	0	0	5	117.11	0.00	0.00	0.00
8	143.10	25.80	36.92	6	0	0	0	6	143.10	0.00	0.00	0.00
9												
10												
11	281.77	25.75	72.56	12	0	0	0	12	281.77	0.00	0.00	0.00
12	189.14	27.50	52.01	8	0	0	0	8	189.14	0.00	0.00	0.00
13	70.34	25.75	18.11	3	0	0	0	3	70.34	0.00	0.00	0.00
14	167.34	25.60	42.84	7	0	0	0	7	167.34	0.00	0.00	0.00
15	236.54	26.20	61.97	10	0	0	0	10	236.54	0.00	0.00	0.00
16												
17												
18												
19	258.34	26.70	68.98	0	11	0	0	11	0.00	258.34	0.00	0.00
20	160.55	27.25	43.75	0	8	0	0	8	0.00	160.55	0.00	0.00
21	212.14	24.75	52.50	0	9	0	0	0	0.00	212.14	0.00	0.00
22	189.11	25.75	48.70	0	8	0	0	8	0.00	189.11	0.00	0.00
23												
24												
25	259.63	26.60	69.06	11	0	0	0	11	259.63	0.00	0.00	0.00
26	283.86	27.00	76.64	12	0	0	0	12	283.86	0.00	0.00	0.00
27	213.39	27.50	58.68	9	0	0	0	9	213.39	0.00	0.00	0.00
28	144.02	27.65	39.82	6	0	0	0	6	144.02	0.00	0.00	0.00
29	119.63	26.85	32.12	5	0	0	0	5	119.63	0.00	0.00	0.00
30												
31						0						
TOTAL	3914.57	26.72	1043.16	131	36	0	0	167	3094.43	820.14	0.00	0.00



2020 Biosolids Management Program

June 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1	260.67	25.45	66.34	11	0	0	0	11	260.67	0.00	0.00	0.00
2	308.03	25.00	77.01	13	0	0	0	13	308.03	0.00	0.00	0.00
3	189.76	24.95	47.35	8	0	0	0	8	189.76	0.00	0.00	0.00
4	143.11	24.75	35.42	6	0	0	0	6	143.11	0.00	0.00	0.00
5	166.99	24.70	41.25	7	0	0	0	7	166.99	0.00	0.00	0.00
6												
7												
8	237.27	26.05	61.81	10	0	0	0	10	237.27	0.00	0.00	0.00
9	212.65	24.30	51.67	9	0	0	0	9	212.65	0.00	0.00	0.00
10	234.66	24.70	57.96	10	0	0	0	10	234.66	0.00	0.00	0.00
11	234.82	26.48	62.18	10	0	0	0	10	234.82	0.00	0.00	0.00
12	166.42	26.90	44.77	7	0	0	0	7	166.42	0.00	0.00	0.00
13												
14												
15	235.02	26.40	62.05	10	0	0	0	10	235.02	0.00	0.00	0.00
16	165.45	25.05	41.45	7	0	0	0	7	165.45	0.00	0.00	0.00
17	211.80	26.48	56.08	9	0	0	0	9	211.80	0.00	0.00	0.00
18	140.54	24.50	34.43	6	0	0	0	6	140.54	0.00	0.00	0.00
19	190.88	26.30	50.20	8	0	0	0	8	190.88	0.00	0.00	0.00
20												
21												
22	259.25	26.48	68.65	11	0	0	0	11	259.25	0.00	0.00	0.00
23	264.20	29.65	78.34	11	0	0	0	11	264.20	0.00	0.00	0.00
24	237.67	28.90	68.69	10	0	0	0	10	237.67	0.00	0.00	0.00
25	188.34	28.85	54.34	8	0	0	0	8	188.34	0.00	0.00	0.00
26	163.95	29.95	49.10	7	0	0	0	7	163.95	0.00	0.00	0.00
27												
28												
29	233.36	26.48	61.79	10	0	0	0	10	233.36	0.00	0.00	0.00
30	214.15	30.20	64.67	9	0	0	0	9	214.15	0.00	0.00	0.00
TOTAL	4658.99	26.48	1235.54	197	0	0	0	197	4658.99	0.00	0.00	0.00



July 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1	140.86	27.37	38.55	6	0	0	0	6	140.86	0.00	0.00	0.00
2	264.34	29.90	79.04	11	0	0	0	11	264.34	0.00	0.00	0.00
3	259.51	29.00	75.26	11	0	0	0	11	259.51	0.00	0.00	0.00
4												
5												
6	313.32	25.50	79.90	13	0	0	0	13	313.32	0.00	0.00	0.00
7	263.78	24.80	65.42	11	0	0	0	11	263.78	0.00	0.00	0.00
8	260.08	28.65	74.51	11	0	0	0	11	260.08	0.00	0.00	0.00
9	214.94	27.70	59.54	9	0	0	0	9	214.94	0.00	0.00	0.00
10	141.08	27.37	38.61	6	0	0	0	6	141.09	0.00	0.00	0.00
11												
12												
13	212.07	27.05	57.36	9	0	0	0	9	212.07	0.00	0.00	0.00
14	141.14	26.45	37.33	6	0	0	0	6	141.14	0.00	0.00	0.00
15	281.41	27.30	76.82	12	0	0	0	12	281.41	0.00	0.00	0.00
16	275.14	27.60	75.94	12	0	0	0	12	275.14	0.00	0.00	0.00
17	113.46	27.37	31.05	5	0	0	0	5	113.46	0.00	0.00	0.00
18												
19												
20	163.89	27.30	44.74	7	0	0	0	7	163.89	0.00	0.00	0.00
21	141.60	26.70	37.81	6	0	0	0	6	141.6	0.00	0.00	0.00
22	263.44	28.00	73.76	0	0	11	0	11	0.00	0.00	263.44	0.00
23	94.23	27.90	26.29	0	0	4	0	4	0.00	0.00	94.23	0.00
24	42.25	27.90	11.79	0	0	2	0	2	0.00	0.00	42.25	0.00
25												
26												
27	256.37	27.37	70.17	0	0	11	0	11	0.00	0.00	256.37	0.00
28	232.76	26.73	62.22	0	0	10	0	10	0.00	0.00	232.76	0.0000
29	209.28	27.37	57.28	0	0	9	0	9	0.00	0.00	209.28	0.00
30	94.32	26.80	25.28	0	0	4	0	4	0.00	0.00	94.32	0.00
31	187.76	27.37	51.39	0	0	0	0	0	0.00	0.00	187.76	0.00
TOTAL	4567.03	27.37	1250.07	135	0	51	0	186	3186.63	0.00	1380.41	0.00



2020 Biosolids Management Program

August 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1												
2												
3												
4	276.29	26.10	72.11	0	0	12	0	12	0.00	0.00	276.29	0.00
5	280.85	26.50	74.43	0	0	12	0	12	0.00	0.00	280.85	0.00
6	118.02	26.45	31.22	0	0	5	0	5	0.00	0.00	118.02	0.00
7	115.59	25.75	29.76	0	0	5	0	5	0.00	0.00	115.59	0.00
8												
9												
10	270.93	24.40	66.11	0	0	12	0	12	0.00	0.00	270.93	0.00
11	203.36	24.56	49.95	0	0	9	0	9	0.00	0.00	203.36	0.00
12	115.60	23.75	27.46	0	0	5	0	5	0.00	0.00	115.60	0.00
13	160.70	23.53	37.81	0	0	7	0	7	0.00	0.00	160.70	0.00
14	164.90	24.35	40.15	0	0	7	0	7	0.00	0.00	164.90	0.00
15												
16												
17	229.45	26.45	60.69	0	0	10	0	10	0.00	0.00	229.45	0.00
18	263.71	25.15	66.32	0	0	11	0	11	0.00	0.00	263.71	0.00
19	283.53	24.90	70.60	0	0	12	0	12	0.00	0.00	283.53	0.00
20	140.62	24.80	34.87	0	0	6	0	6	0.00	0.00	140.62	0.00
21	138.64	24.35	33.76	0	0	6	0	6	0.00	0.00	138.64	0.00
22												
23												
24	360.12	24.50	88.23	0	0	15	0	15	0.00	0.00	360.12	0.00
25	261.24	21.35	55.77	0	0	11	0	11	0.00	0.00	261.24	0.00
26	139.04	22.85	31.77	0	0	6	0	6	0.00	0.00	139.04	0.00
27	261.49	22.30	58.31	0	0	11	0	11	0.00	0.00	261.49	0.00
28	95.95	24.56	23.57	0	0	4	0	4	0.00	0.00	95.95	0.00
29												
30												
31	288.14	24.56	70.77	0	0	0	0	0	0.00	0.00	288.14	0.00
TOTAL	4168.17	24.56	952.89	0	0	166	0	166	0.00	0.00	4168.17	0.00



2020 Biosolids Management Program

September 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1	237.39	23.65	56.14	0	0	10	0	0	0.00	0.00	237.39	0.00
2	235.43	22.60	53.21	0	0	10	0	0	0.00	0.00	235.43	0.00
3	166.45	22.95	38.20	0	0	7	0	0	0.00	0.00	166.45	0.00
4	143.35	25.40	36.41	0	0	6	0	6	0.00	0.00	143.35	0.00
5												
6												
7												
8	263.13	22.74	59.84	0	0	11	0	11	0.00	0.00	263.13	0.00
9	143.34	22.74	32.60	0	0	6	0	6	0.00	0.00	143.34	0.00
10	284.90	22.74	64.79	0	0	12	0	12	0.00	0.00	284.90	0.00
11	119.72	22.74	27.22	0	0	5	0	5	0.00	0.00	119.72	0.00
12												
13												
14	311.32	22.74	70.79	0	0	13	0	13	0.00	0.00	311.32	0.00
15	255.19	22.74	58.03	0	0	11	0	11	0.00	0.00	255.19	0.00
16	140.33	21.85	30.66	0	0	6	0	6	0.00	0.00	140.33	0.00
17	136.78	21.85	29.89	0	0	6	0	6	0.00	0.00	136.78	0.00
18	71.29	22.60	16.11	0	0	3	0	3	0.00	0.00	71.29	0.00
19												
20												
21	208.49	22.20	46.28	0	0	9	0	9	0.00	0.00	208.49	0.00
22	281.41	21.60	60.78	0	0	12	0	12	0.00	0.00	281.41	0.00
23	188.61	22.74	42.89	0	0	8	0	8	0.00	0.00	188.61	0.00
24	182.30	22.74	41.46	0	0	8	0	8	0.00	0.00	182.30	0.00
25	91.95	21.10	19.40	0	0	4	0	4	0.00	0.00	91.95	0.00
26												
27												
28	259.48	24.15	62.66	0	0	11	0	11	0.00	0.00	259.48	0.00
29	299.04	22.90	68.48	0	0	13	0	13	0.00	0.00	299.04	0.00
30	139.48	22.74	31.72	0	0	6	0	6	0.00	0.00	139.48	0.00
TOTAL	4159.38	22.74	947.57	0	0	0	0	0	0.00	0.00	4159.38	0.00



October 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1	139.56	22.90	31.96	0	0	6	0	6	0.00	0.00	139.56	0.00
2	139.30	22.35	31.13	0	0	6	0	6	0.00	0.00	139.30	0.00
3												
4												
5	287.45	21.90	62.95	0	0	12	0	12	0.00	0.00	287.45	0.00
6	234.51	21.90	51.36	0	0	10	0	10	0.00	0.00	234.51	0.00
7	166.28	22.51	37.43	0	0	7	0	7	0.00	0.00	166.28	0.00
8	166.76	22.00	36.69	0	0	7	0	7	0.00	0.00	166.76	0.00
9	141.80	24.20	34.32	0	0	6	0	6	0.00	0.00	141.80	0.00
10												
11												
12	191.79	22.51	43.17	0	0	8	0	8	0.00	0.00	191.79	0.00
13	191.53	23.90	45.78	0	8	0	0	8	0.00	191.53	0.00	0.00
14	213.63	22.80	48.71	0	9	0	0	9	0.00	213.63	0.00	0.00
15	213.73	22.75	48.62	0	9	0	0	9	0.00	213.73	0.00	0.00
16	117.79	22.15	26.09	0	5	0	0	5	0.00	117.79	0.00	0.00
17												
18												
19	192.07	22.51	43.12	0	8	0	0	8	0.00	192.07	0.00	0.00
20	197.77	22.30	44.10	0	8	0	0	8	0.00	197.77	0.00	0.00
21	191.55	21.35	40.90	0	8	0	0	8	0.00	191.55	0.00	0.00
22	191.63	21.55	41.30	0	8	0	0	8	0.00	191.63	0.00	0.00
23	188.14	22.30	41.96	0	8	0	0	8	0.00	188.14	0.00	0.00
24												
25												
26	190.11	23.25	44.20	0	8	0	0	8	0.00	190.11	0.00	0.00
27	188.41	22.51	42.41	0	8	0	0	8	0.00	188.41	0.00	0.00
28	188.49	22.51	42.42	0	8	0	0	8	0.00	188.49	0.00	0.00
29	188.14	22.55	42.43	0	8	0	0	8	0.00	188.14	0.00	0.00
30	282.70	22.51	63.63	0	12	0	0	12	0.00	282.70	0.00	0.00
31						0						
TOTAL	4203.14	22.51	944.66	0	115	62	0	177	0.00	2735.69	1467.45	0.00



2020 Biosolids Management Program

November 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1												
2	184.38	23.05	42.50	0	8	0	0	0	0.00	184.38	0.00	0.00
3	212.14	23.05	48.90	0	9	0	0	0	0.00	212.14	0.00	0.00
4	191.73	22.35	42.85	0	8	0	0	8	0.00	191.73	0.00	0.00
5	263.60	21.90	57.73	0	11	0	0	11	0.00	263.60	0.00	0.00
6	138.53	22.75	31.52	0	6	0	0	6	0.00	138.53	0.00	0.00
7												
8												
9	216.33	22.95	49.65	0	9	0	0	9	0.00	216.33	0.00	0.00
10	239.60	22.90	54.87	0	10	0	0	10	0.00	239.60	0.00	0.00
11												
12	383.37	22.95	87.98	0	15	0	0	15	0.00	383.37	0.00	0.00
13	95.25	23.60	22.48	0	4	0	0	4	0.00	95.25	0.00	0.00
14												
15												
16	192.32	23.50	45.20	0	8	0	0	8	0.00	192.32	0.00	0.00
17	191.71	22.90	43.90	0	8	0	0	8	0.00	191.71	0.00	0.00
18	215.21	21.50	46.27	0	9	0	0	9	0.00	215.21	0.00	0.00
19	215.21	23.05	49.61	0	9	0	0	9	0.00	215.21	0.00	0.00
20	118.70	23.05	27.36	0	5	0	0	5	0.00	118.70	0.00	0.00
21												
22												
23	226.37	23.65	53.54	0	10	0	0	10	0.00	226.37	0.00	0.00
24	179.62	23.95	43.02	0	8	0	0	8	0.00	179.62	0.00	0.00
25	181.24	23.40	42.41	0	8	0	0	8	0.00	181.24	0.00	0.00
26	225.84	23.20	52.39	0	10	0	0	10	0.00	225.84	0.00	0.00
27	141.27	23.60	33.34	0	6	0	0	6	0.00	141.27	0.00	0.00
28												
29												
30	192.20	23.70	45.55	0	8	0	0	8	0.00	192.20	0.00	0.00
TOTAL	4004.62	23.05	921.06	0	169	0	0	169	0.00	4004.62	0.00	0.00



December 2020												
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost
1	215.70	23.65	51.01	0	9	0	0	9	0.00	215.70	0.00	0.00
2	143.11	23.60	33.77	0	6	0	0	6	0.00	143.11	0.00	0.00
3	48.28	22.30	10.77	0	2	0	0	2	0.00	48.28	0.00	0.00
4	241.52	22.90	55.31	0	10	0	0	10	0.00	241.52	0.00	0.00
5												
6												
7	217.04	22.40	48.62	0	9	0	0	9	0.00	217.04	0.00	0.00
8	192.40	22.20	42.71	0	8	0	0	8	0.00	192.40	0.00	0.00
9	192.81	21.80	42.03	0	8	0	0	8	0.00	192.81	0.00	0.00
10	239.93	20.70	49.67	0	10	0	0	10	0.00	239.93	0.00	0.00
11	168.16	22.75	38.26	0	7	0	0	7	0.00	168.16	0.00	0.00
12												
13												
14	193.28	21.45	41.46	0	8	0	0	8	0.00	193.28	0.00	0.00
15	168.66	21.35	36.01	0	7	0	0	7	0.00	168.66	0.00	0.00
16	265.01	21.95	58.17	0	11	0	0	11	0.00	265.01	0.00	0.00
17	191.09	22.60	43.19	0	8	0	0	8	0.00	191.09	0.00	0.00
18	143.91	22.85	32.88	0	6	0	0	6	0.00	143.91	0.00	0.00
19												
20												
21	291.45	20.95	61.06	0	12	0	0	12	0.00	291.45	0.00	0.00
22	289.89	20.40	59.14	0	12	0	0	12	0.00	289.89	0.00	0.00
23	191.70	19.85	38.05	0	8	0	0	8	0.00	191.70	0.00	0.00
24	169.84	20.30	34.48	0	7	0	0	7	0.00	169.84	0.00	0.00
25												
26												
27												
28	266.82	21.68	57.85	0	11	0	0	11	0.00	266.82	0.00	0.00
29	265.96	21.68	57.66	0	11	0	0	11	0.00	265.96	0.00	0.00
30	289.35	19.85	57.44	0	12	0	0	12	0.00	289.35	0.00	0.00
31	314.04	19.65	61.71	0	13	0	0	13	0.00	314.04	0.00	0.00
TOTAL	4699.95	21.68	1011.23	0	195	0	0	195	0.00	4699.95	0.00	0.00



2020 Biosolids Management Program

January - December 2020													
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost	
TOTAL	54327.87	24.86	13452.49	670.00	1082.00	279.00	59.00	2090.00	15885.49	25859.87	11175.41	1407.11	

January - December 2020													
Date	Wet Cake	% Total Solids	Dry Cake	Loads to Landfill	Loads for Soil Fab	Loads to Land App	Loads to Compost	Loads Total	Wet Cake Landfill	Wet Cake Soil Fab	Wet Cake Land App	Wet Cake Compost	
TOTAL	54979.06	24.86	13667.79	670.00	1082.00	476.00	59.00	2287.00	16724.81	25859.87	11175.41	1218.97	

NOTES:

Biosolids volumes derived from weigh scales at BRRMF, considered more accurate than NEWPCC scale system.

Calculated using a combination of Brady scale weights (Landfill and compost) and NEWPCC volumes (Soil Fab and Land App).