# Killaloe Wastewater System

## Annual Report

Prepared For: The Township of Killaloe, Hagarty and Richards

Reporting Period of January 1st – December 31st 2019

Issued: March 6th, 2020

Revision: 0

Operating Authority:

OCWA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

This report has been prepared as a general summary of results and events. There is no Certificate of Approval governing this facility to provide an annual report and it is thereby operated based solely on guidelines.

# Table of Contents

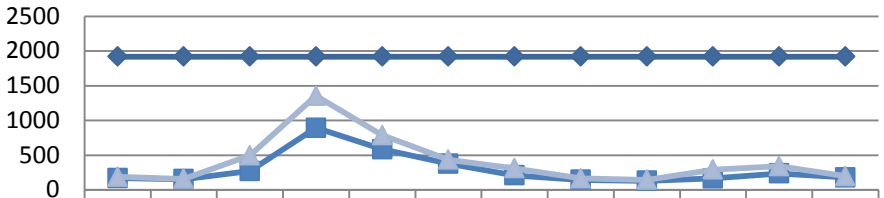
## Operations and Compliance Reliability Indices

| Compliance Event | # of Events | Details |
|---|---|---|
| Ministry of Environment Inspections | 0 | Last inspection completed October 8, 2014. Report received November 25, 2014. |
| Ministry of Labour Inspections | 0 | There were Ministry of Labour inspections in 2019. |
| Effluent Parameter Exceedances | 0 | The tested parameters at the Killaloe wastewater treatment facility produced results below the allowed limits in 2019 |
| Bypass/Overflows | 0 | There were no bypass or overflow events in 2019. |
| Community Complaints | 0 | There were no community complaints in 2019. |
| Spills | 0 | There were no spills to report in 2019. |

# Treatment Flows

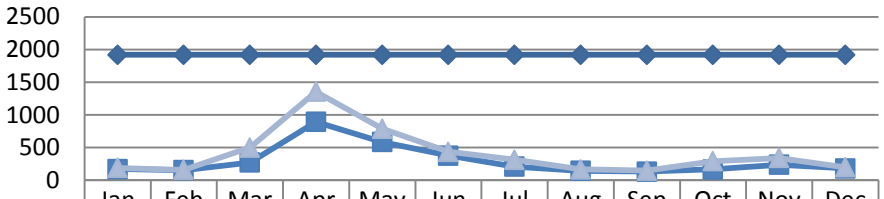
The Killaloe wastewater treatment facility is operating on average under half of its rated capacity.

## Raw Flow (m3/d)



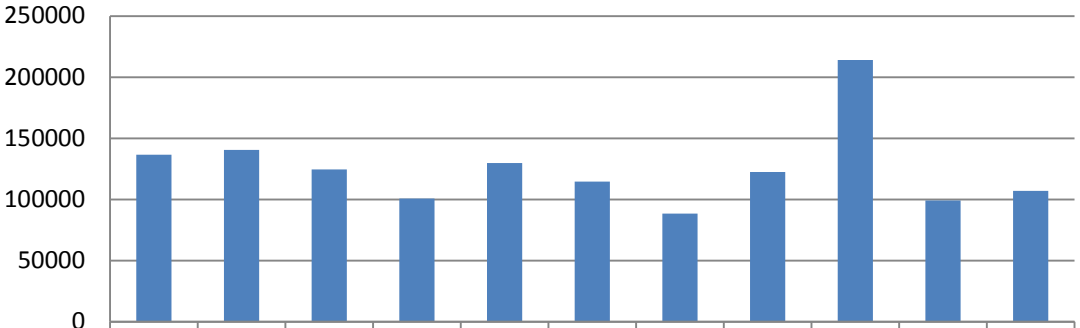

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Limit | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 |
| Average Daily Flow (m3/d) | 171 | 154 | 271 | 893 | 584 | 377 | 209 | 144 | 131 | 166 | 237 | 180 |
| Maximum Daily Flow (m3\d) | 189 | 160 | 498 | 1354 | 788 | 435 | 312 | 166 | 146 | 292 | 340 | 198 |

## Effluent Flow (m3/d)




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Limit | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 |
| Average Daily Flow (m3/d) | 171 | 154 | 271 | 893 | 584 | 377 | 209 | 144 | 131 | 166 | 237 | 180 |
| Maximum Daily Flow (m3\d) | 189 | 160 | 498 | 1354 | 788 | 435 | 312 | 166 | 146 | 292 | 340 | 198 |

*Annual Comparison (m3)*




| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Annual Flow | 136667 | 140401 | 124631 | 100748 | 129853 | 114491 | 88454 | 122448 | 213981 | 99094 | 106910 |

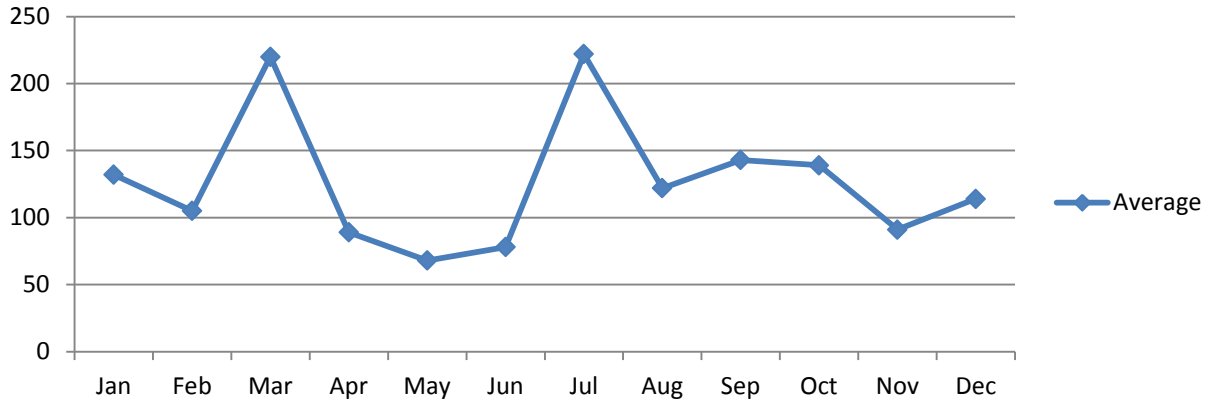
## Effluent Quality Assurance or Control Measures

Effluent control measures include in-house sampling and testing for operational parameters such as suspended solids, pH, soluble phosphorus, and dissolved oxygen. In-house testing provides real time results which are then used to enhance process and operational performance. All in-house sampling and analysis is performed by certified operations staff utilizing approved methods and protocols for sampling, analysis and recording as specified in the Ministry's Procedure F-10-1, *Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works*; the Ministry's publication, *Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater*; and the publication, *Standard Methods for the Examination of Water and Wastewater*.

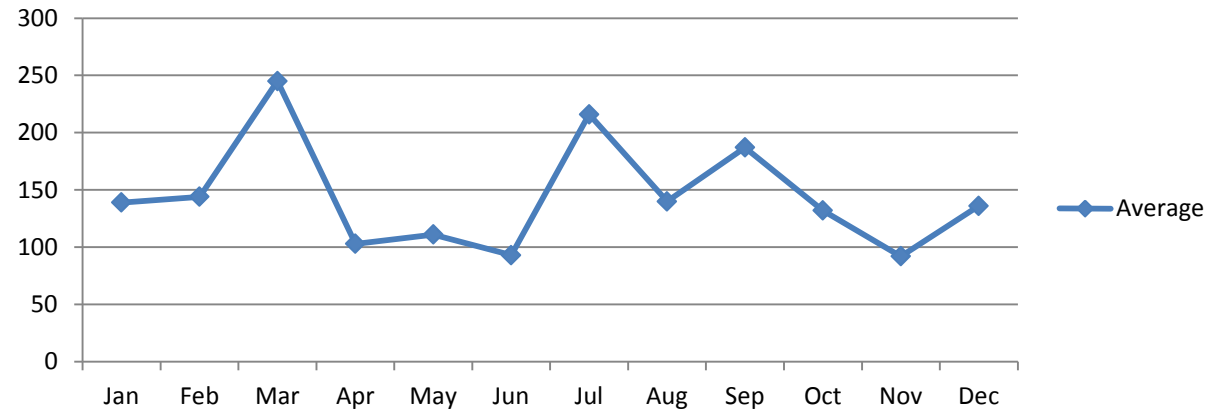
All final effluent samples collected during the reporting period to meet ECA sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis, with the exception of pH, temperature, and unionized ammonia. SGS Lakefield Research has been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, the Ontario Clean Water Agency is ensuring appropriate control measures are undertaken during sample analysis. The pH and temperature parameters were analyzed in the field at the time of sample collection by certified operators, to ensure accuracy and precision of the results obtained. The unionized ammonia was calculated using the total ammonia nitrogen concentration, pH and temperature as required by the facility Certificate of Approval.

## Raw Sewage Quality

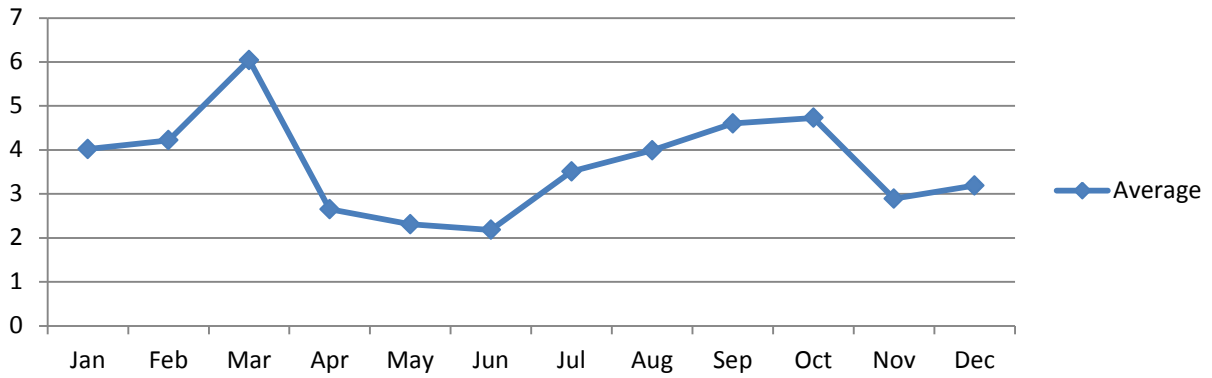
### BOD5



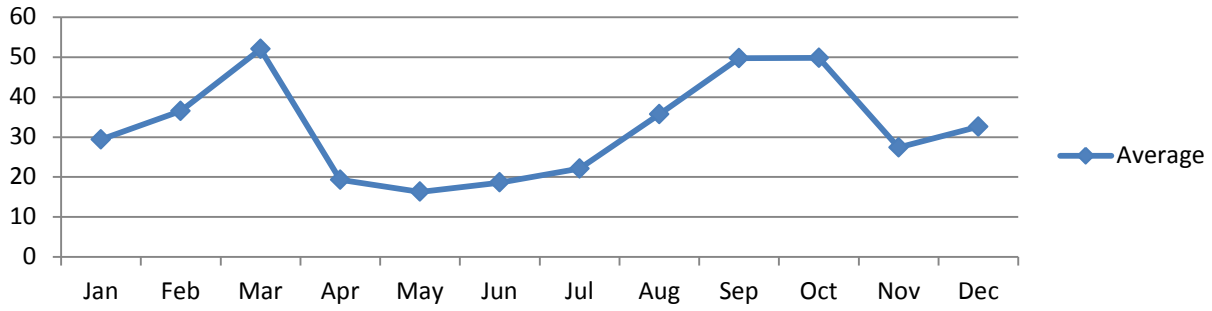
## Total Suspended Solids



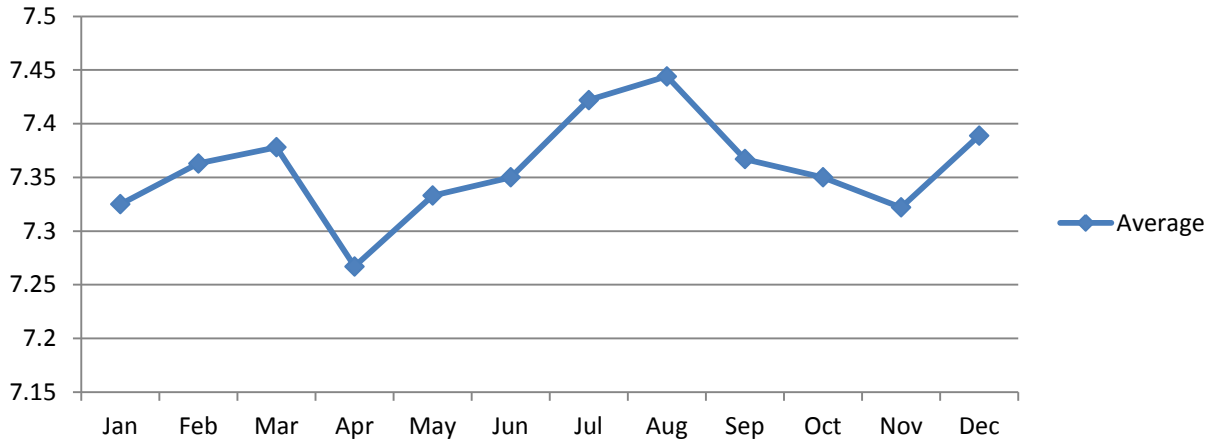

## Total Phosphorus




## Total Ammonia Nitrogen



**pH**

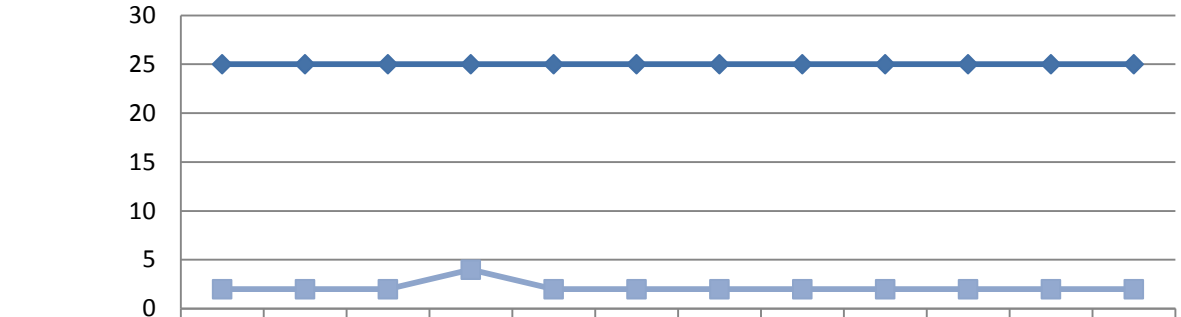



## Effluent Quality

There are no effluent limits defined in the certificate of approval or Environmental Compliance Approval for this facility. This facility operates to ensure current guidelines are not exceeded.
The Federal Government also regulates certain sewage effluent parameter under the Federal Fisheries Act. The results are submitted to Environment Canada (WESR) on a quarterly basis.

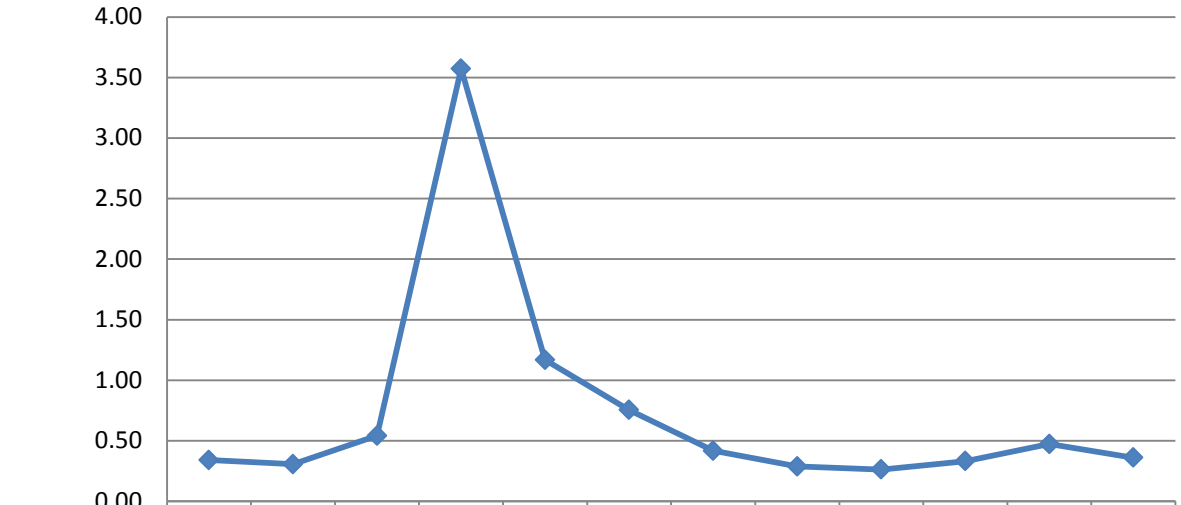
## CBOD5

*Concentration (mg/L)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECA Limit | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Average | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

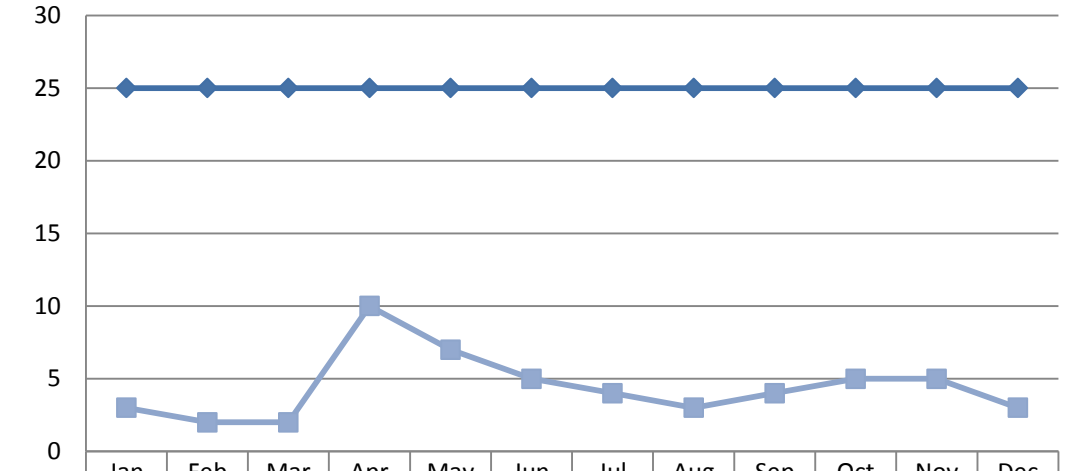
*Loading (kg/d)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 0.34 | 0.31 | 0.54 | 3.57 | 1.17 | 0.75 | 0.42 | 0.29 | 0.26 | 0.33 | 0.47 | 0.36 |

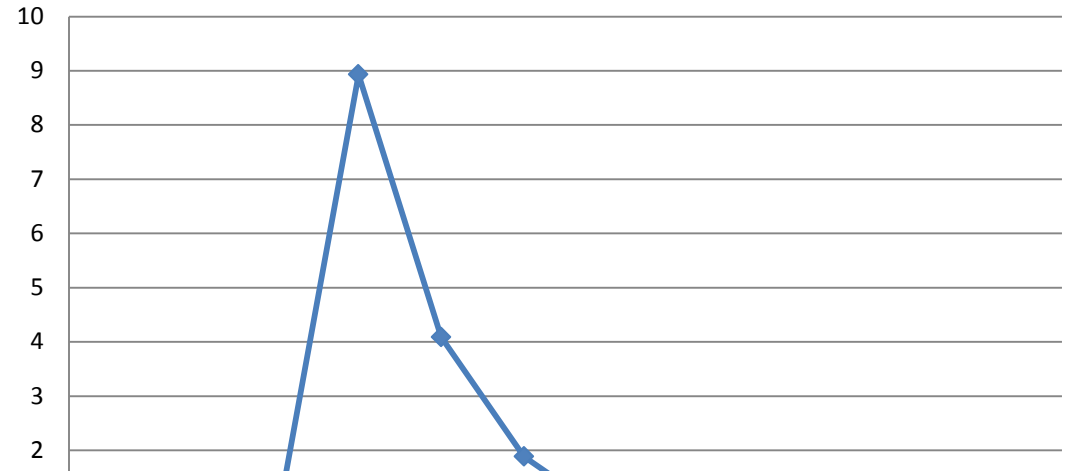
## Total Suspended Solids

*Concentration (mg/L)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECA Limit | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Average | 3 | 2 | 2 | 10 | 7 | 5 | 4 | 3 | 4 | 5 | 5 | 3 |

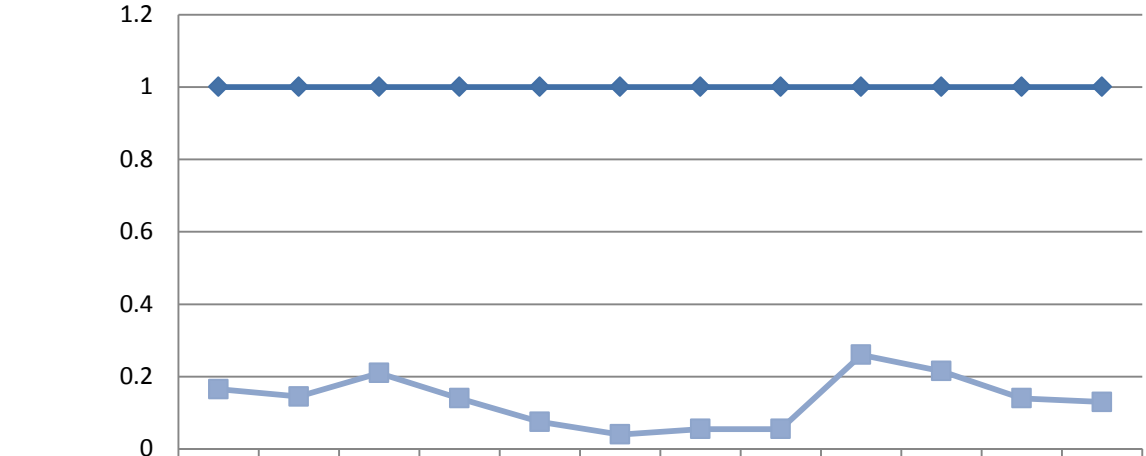
*Loading (kg/d)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 0.512 | 0.307 | 0.542 | 8.931 | 4.089 | 1.884 | 0.835 | 0.432 | 0.525 | 0.828 | 1.183 | 0.541 |

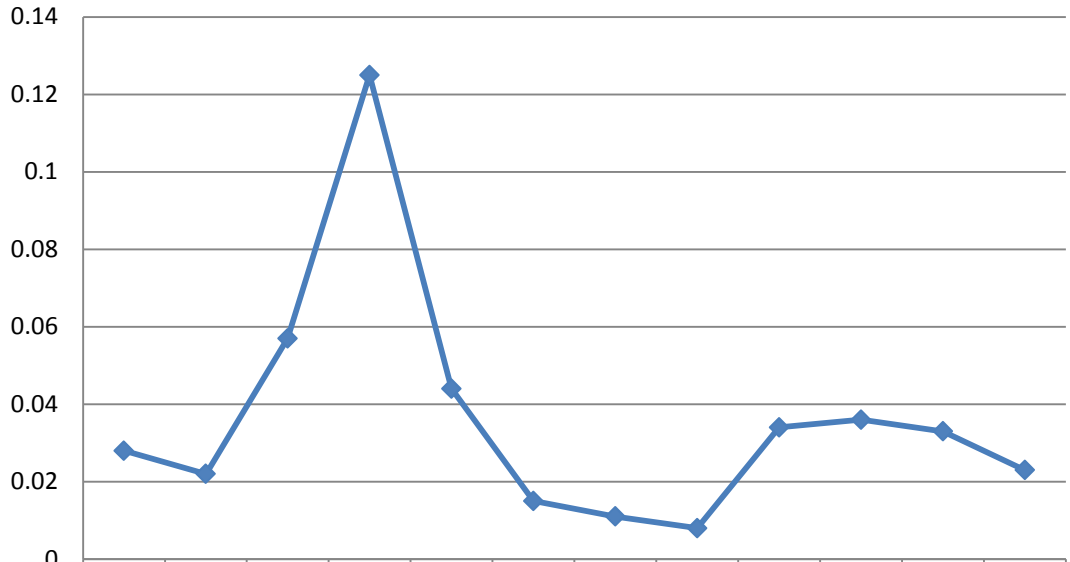
## Total Phosphorus

*Concentration (mg/L)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECA Limit | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Average | 0.17 | 0.15 | 0.21 | 0.14 | 0.08 | 0.04 | 0.06 | 0.06 | 0.26 | 0.22 | 0.14 | 0.13 |

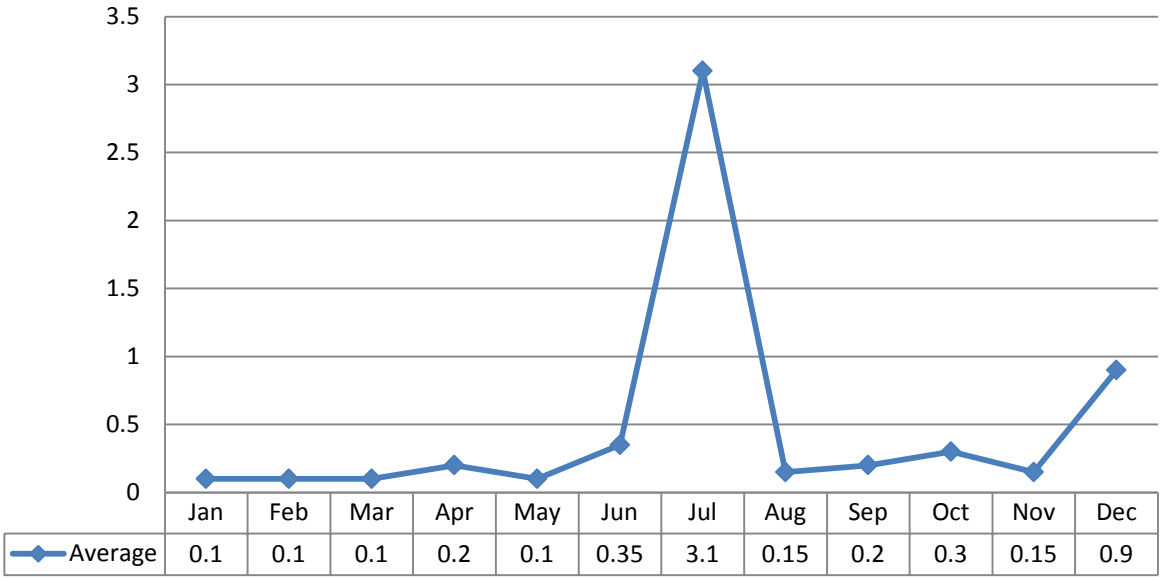
*Loading (kg/d)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 0.028 | 0.022 | 0.057 | 0.125 | 0.044 | 0.015 | 0.011 | 0.008 | 0.034 | 0.036 | 0.033 | 0.023 |

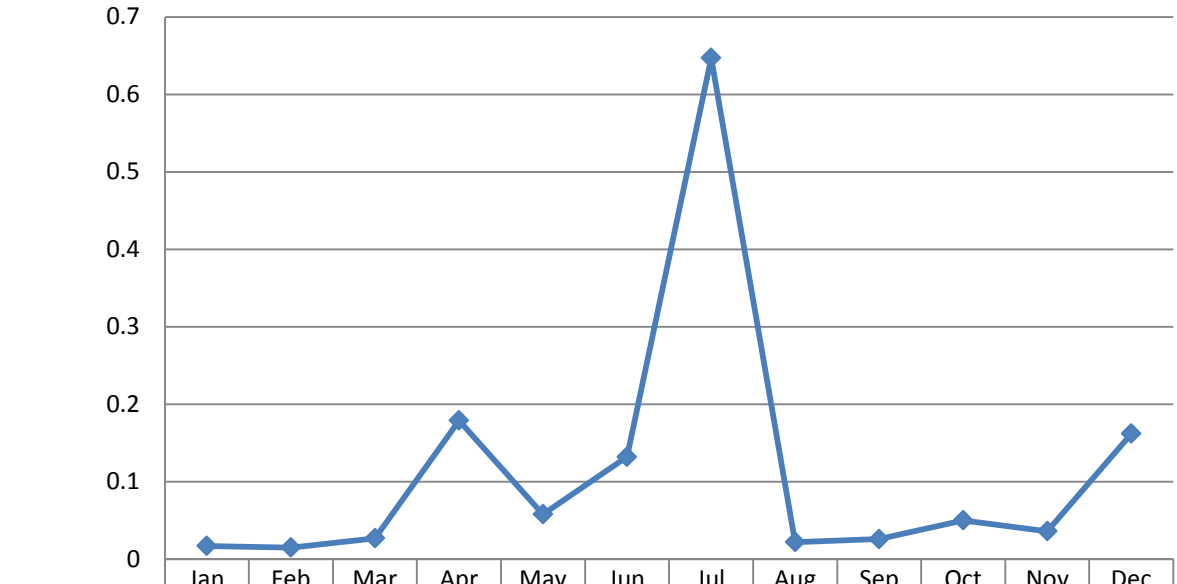
## Total Ammonia Nitrogen

*Concentration (mg/L)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.35 | 3.1 | 0.15 | 0.2 | 0.3 | 0.15 | 0.9 |

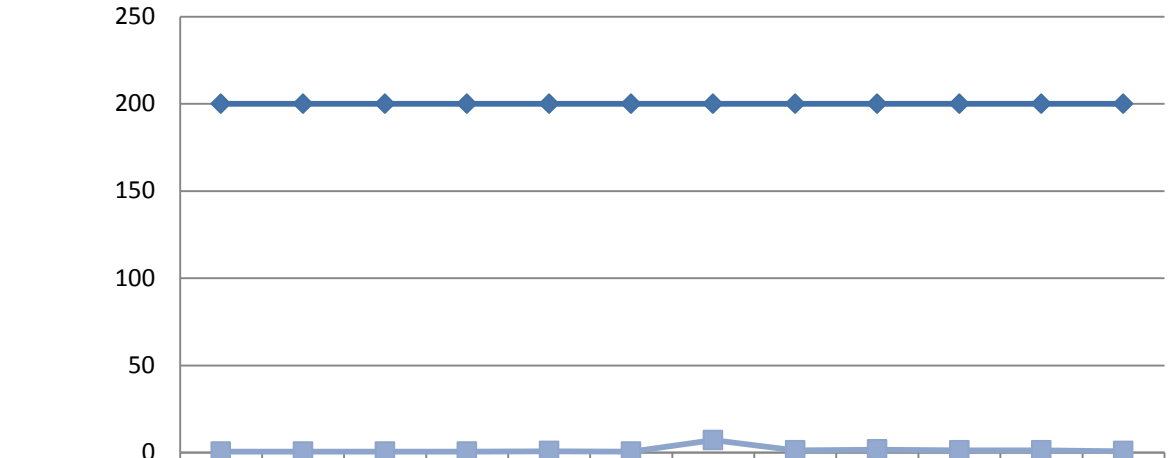
*Loading (kg/d)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 0.017 | 0.015 | 0.027 | 0.179 | 0.058 | 0.132 | 0.647 | 0.022 | 0.026 | 0.05 | 0.036 | 0.162 |

## Un-Ionized Ammonia/Nitrogen/TKN

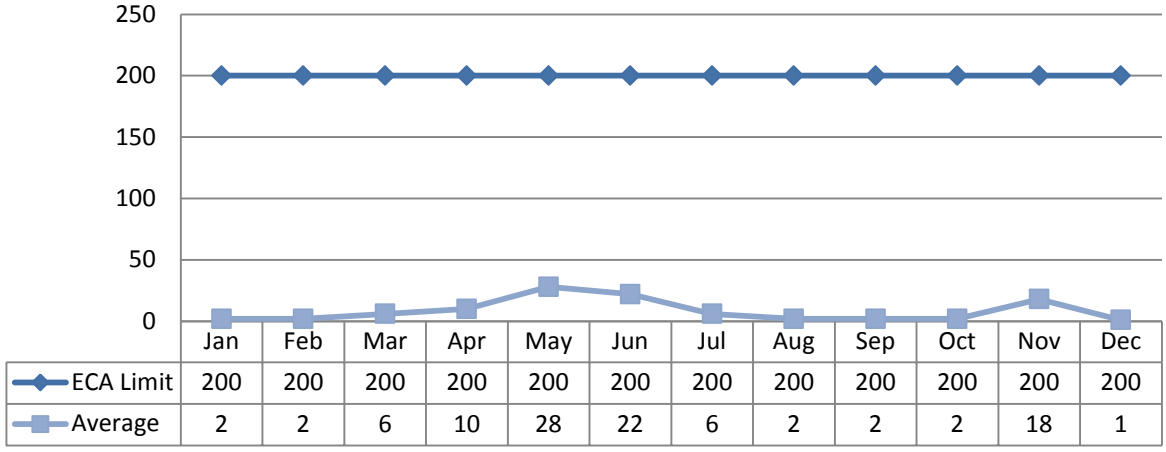
*Concentration (mg/L)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECA Limit | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Average | 0.5 | 0.5 | 0.5 | 0.5 | 0.8 | 0.5 | 7.1 | 1.3 | 1.7 | 1.3 | 1.3 | 0.8 |

## E-coli

*Geometric Mean (cfu/100mL)*

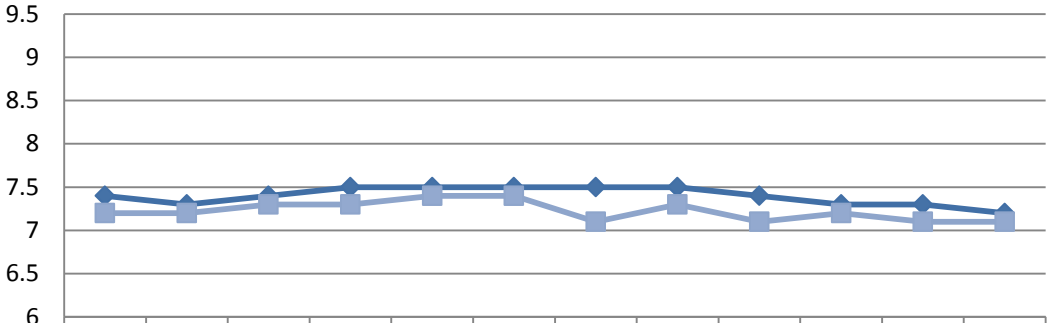



| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECA Limit | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Average | 2 | 2 | 6 | 10 | 28 | 22 | 6 | 2 | 2 | 2 | 18 | 1 |

### pH

*Compliance*

pH is to remain in the range of 6-9. Each instance the pH is outside of that range is reported as a non-compliance.




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum | 7.4 | 7.3 | 7.4 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.3 | 7.3 | 7.2 |
| Minimum | 7.2 | 7.2 | 7.3 | 7.3 | 7.4 | 7.4 | 7.1 | 7.3 | 7.1 | 7.2 | 7.1 | 7.1 |

## Maintenance

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer's and/or industry standards. Maintenance is completed using various tools and operational supports. The Eastern Regional Hub has specialized certified staff such as Millwrights, Electricians and Instrumentation Specialists to name a few.

OCWA uses a Workplace Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is completed and added to the system.

Capital projects are listed and provided to the Township of Killaloe, Hagarty and Richards in the form of a "Capital Forecast". This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

| | |
|---|---|
| Preventative Maintenance Work Orders Completed | 117 |
| Operational Maintenance Work Orders Completed | 50 |
| Corrective Maintenance Work Orders Completed | 11 |

### Maintenance Highlights

| WO# | Details |
|---|---|
| 1464975 | RAS piping maintenance |

### Flow Meter Calibrations and Maintenance

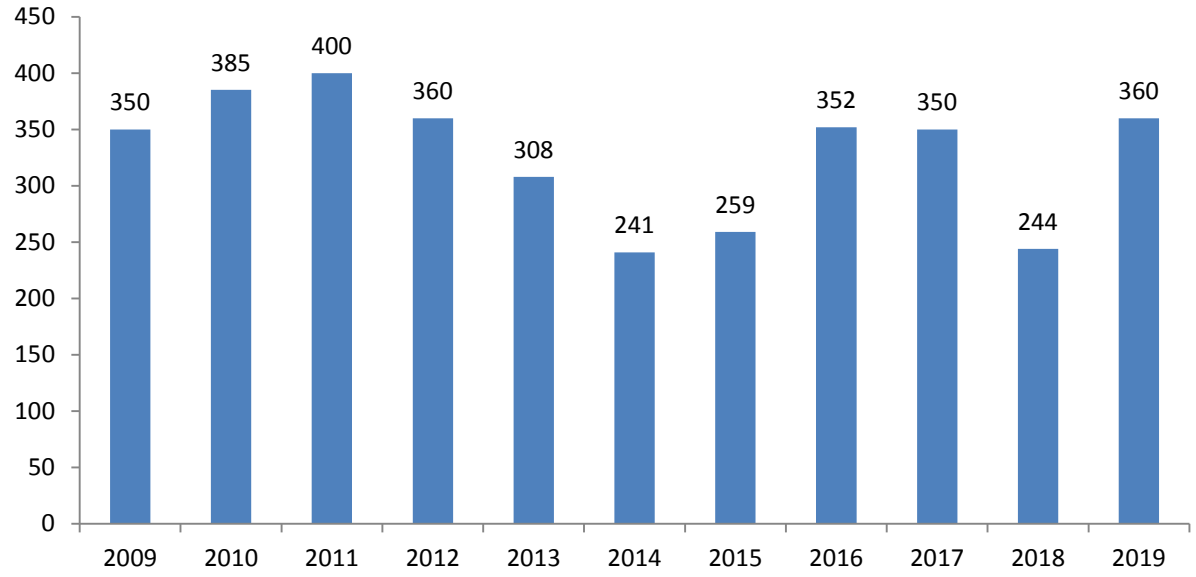
Calibration of the effluent flow meter was completed April 16th, 2019.

## Sludge Generation

### Sludge Disposal Summary

| Date | Disposal Location | Approval Number | Total Volume (m3) |
|---|---|---|---|
| June | Trotter - Graham | 23904 | 80 |
| July | Trotter – Home | 23903 | 40 |
| August | Terrapure Storage Facility | ECA# S-3708-42 | 40 |
| September | | | 40 |
| October | | | 120 |
| November | DeVries – Home | 23774 | 40 |

### Annual Comparison (m3/year)




It is anticipated that sludge volumes in 2020 will remain similar to the 2019 volumes.

# Summary of Abnormal Discharge Events

## Bypass/Overflow

There were no bypass/overflow events reported in 2019.

## Spills

There were no spills or abnormal discharges from this system in 2019.

# Appendix A

## Biosolids Quality Report

terrapure Organics Solutions

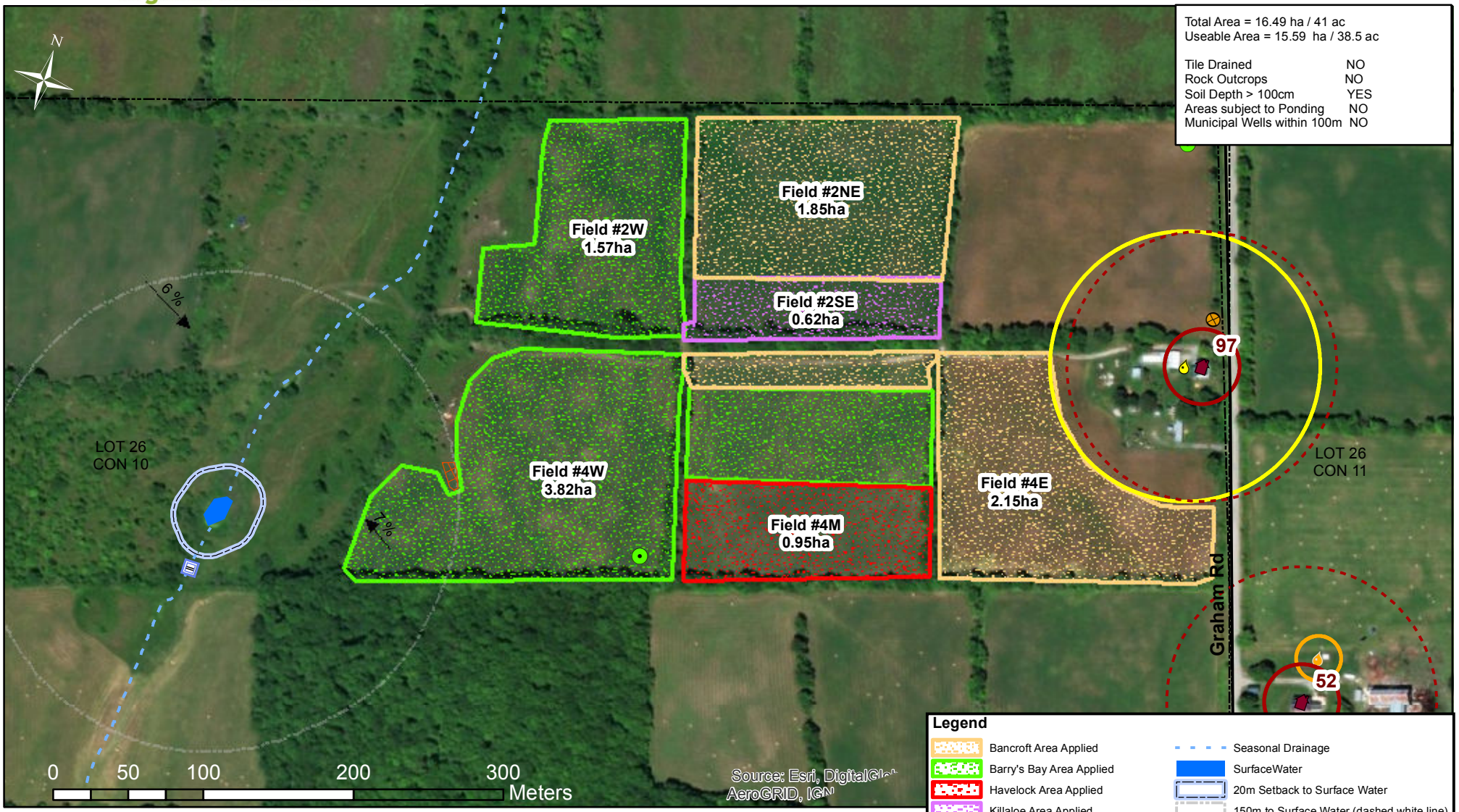
# Killaloe - Sites Applied with Biosolids 2019

| *Date 2019* | Farmer/ Landowner | NASM# | Lot | Con | Township | Ward | Field # | Application Method | Total Volume (m3) | Area Spread (ha) |
|---|---|---|---|---|---|---|---|---|---|---|
| June 24 | Trotter - Graham | 23904 | 26 | 10 | Township of Madoc | Madoc | 2 | Surface/Standing Crop | 80 | 0.62 |
| July 2 | Trotter - Home | 23903 | 25 | 10 | Township of Madoc | Madoc | 6 | Surface/Standing Crop | 40 | 0.5 |
| Aug 28 | Terrapure Storage Facility | ECA# S-3708-42 | 19 | 6 | Greater Napanee | | West Tank | n/a | 40 | n/a |
| Sept 5 | | | | | | | | | 40 | |
| Oct 17 | | | | | | | | | 120 | |
| Nov 28 | DeVries - Home | 23774 | 4-5 | 3 | Municipality of Centre Hastings | Huntingdon | 2 | Incorporated | 40 | 0.31 |
| | | | | | | | | **Totals** | **360** | **1.43** |

3.5 ac

terrapure®
Organics Solutions

# Trotter - Graham Farm
# Area Applied Map: June 19-24, 2019




Inspected by: Greg Hillier
Inspection Date: May 7, 2019
Projection: UTM Zone 18, NAD 83
Lot 26 Con 10 Township of Madoc
Hastings County

Notes:
1. All residences within 90m of the farm unit are identified on the map.
2. There are no residential areas or commercial, community or institutional uses within 450m of the farm unit.
3. All surface water within 150m of the farm unit is identified on the map.
4. There are no other known wells within 90m of the farm unit.
5. The Maximum Sustained Slope within 150m of Surface Water is 7%
6. The site is not tile drained. There are no tile inlets or outlets on the farm unit.

**Legend**

- Bancroft Area Applied
- Barry's Bay Area Applied
- Havelock Area Applied
- Killaloe Area Applied
- Unuseable Area - slope >12%
- Residence
- 25m Setback to Residence
- 90m Setback to Res (OC2 Surface)
- Drilled Well
- 15m Setback to Drilled Well
- Dug Well
- 90m Setback to Dug Well
- Culvert
- Seasonal Drainage
- SurfaceWater
- 20m Setback to Surface Water
- 150m to Surface Water (dashed white line)
- Slope Direction
- Lots & Cons
- Field Access
- GPS Location
- Roads
- Test Hole - Soil depth >100cm

## General Information

Any false or misleading information included in this document may result in non-compliance with any approvals or permits granted, and prosecution in accordance to the provisions of the Nutrient Management Act, 2002.

### *Compliance with Regulatory Standards*

The evaluation performed when generating this Post Application Report assumes that all sources of nutrients, including fertilizers, intended for land application on this field have been included when preparing the NASM plan.

Based on the data supplied in this Post Application Report, the land application practices described in this document are in compliance with regulatory standards.

### *List of Attachments*

Required Sampling and Analysis Results
Maps/Sketchs

## Preparer Information

Greg Hillier (#17314)
Terrapure Organics Solutions
1250 Thornton Rd. South
Oshawa, ON, Canada L1J 7E2
Phone #1: 905-242-1470
Email: ghillier@terrapureenv.com

## Agricultural Operation Information

Federal Business Number:

Operation Type: Sole Proprietorship

Operator Contact Information

Dylan Trotter
29 Bailey Road
Madoc, ON, Canada K0K 2K0
Phone #1: 613-813-6300

Owner is the same as the operator

## Material Source Summary

### *Killaloe*

Form: Liquid

Category: 3
NASM Type: 11b. Liquid aerobically digested sewage biosolids
Material Generator: Township of Killaloe, Hagarty & Richards
1 John Street
Killaloe, ON, Canada K0J 2A0
Phone #1: 613-757-2300

Metals Content (CM) Level: CM2 (confirmed by lab analysis)
Pathogen Content (CP) Level: CP2 (confirmed by lab analysis)
Odour Category (OC): OC2

Beneficial Use

Total Concentration of PAN, PAP, and PAK:1891 ppm (Wet Basis)

Wet Basis

| Nutrient | Value | |
|---|---|---|
| Dry Matter (DM) | 3.625 % | |
| Nitrogen (Total Kjeldhal Nitrogen) | 0.227 % | |
| Ammonia + Ammonium Nitrogen | 20.5 ppm | |
| Nitrate + Nitrite Nitrogen | < 0.58 ppm | |
| Phosphorus (P) | 0.1033 % | |
| Potassium (K) | 0.023 % | |
| Arsenic (As) | 0.05 ppm | CM1 |
| Cadmium (Cd) | 0.025 ppm | CM1 |
| Cobalt (Co) | 0.07 ppm | CM1 |
| Chromium (Cr) | 0.41 ppm | CM1 |
| Copper (Cu) | 42.8 ppm | CM2 |
| Mercury (Hg) | 0.011 ppm | CM1 |
| Molybdenum (Mo) | 0.21 ppm | CM2 |
| Nickel (Ni) | 0.56 ppm | CM1 |
| Lead (Pb) | 0.55 ppm | CM1 |
| Selenium (Se) | 0.1 ppm | CM2 |
| Zinc (Zn) | 17.5 ppm | CM1 |
| E. coli | 5242154 CFU/100ml | CP2 |

## Farm Unit Summary

### *Graham*

This farm:
Receives ASM
Receives Commercial Fertilizer
Receives NASM

Status: Owned

Farm Location
County of Hastings, Township of Madoc
MADOC, Concession: 10, Lot: 26

Roll Number(s) 123600001514600

911 Address:

## Field Summary

### *Field 2, 2SE*

Area for Material: 0.62 ha
Planned Material Application Frequency: Two of Every Five Years

| **(Fall 2018 - Fall 2019)** | Agronomic (kg/ha) N | Agronomic (kg/ha) P2O5 | Agronomic (kg/ha) K2O | Crop Removal (kg/ha) N | Crop Removal (kg/ha) P2O5 | Crop Removal (kg/ha) K2O |
|---|---|---|---|---|---|---|
| **Hay, alfalfa (3 cuts) @ 7.8 tonne/ha**<br>Planted: May 1, 2019<br>Harvested: September 1, 2019 | 0 | -90 | -20 | -244 | -51 | -233 |
| **Material App 1**<br>June 24, 2019 (actual)<br>Killaloe @ 129 m³/ha<br>Total Applied: 80 m³<br>Tanker, Not Incorporated Standing Crop | 89 | 122 | 32 | 89 | 244 | 32 |
| **Nutrient Balance**<br>September 1, 2018 - August 31, 2019 | 89 | 32 | 12 | -155 | 193 | -201 |

## NASM Application Summary

### *Regulated Soil Parameters*

1 addition(s) over regulated time period

Soil Test Date: May 9, 2019

P Soil Test: 7 ppm

pH Soil Test: 7.6

| Regulated Metal | Soil Test | This Application | Total Applied | 5 Year Limit |
|---|---|---|---|---|
| Arsenic (As) | 1.5 ppm | 0.006 kg/ha | 0.006 kg/ha | 0% |
| Cadmium (Cd) | 0.22 ppm | 0.003 kg/ha | 0.003 kg/ha | 1% |
| Cobalt (Co) | 8.1 ppm | 0.009 kg/ha | 0.009 kg/ha | 0% |
| Chromium (Cr) | 31 ppm | 0.053 kg/ha | 0.053 kg/ha | 0% |
| Copper (Cu) | 13 ppm | 5.523 kg/ha | 5.523 kg/ha | 41% |
| Mercury (Hg) | < 0.05 ppm | 0.001 kg/ha | 0.001 kg/ha | 2% |
| Molybdenum (Mo) | 0.1 ppm | 0.027 kg/ha | 0.027 kg/ha | 3% |
| Nickel (Ni) | 19 ppm | 0.072 kg/ha | 0.072 kg/ha | 2% |
| Lead (Pb) | 7.8 ppm | 0.071 kg/ha | 0.071 kg/ha | 1% |
| Selenium (Se) | < 0.7 ppm | 0.013 kg/ha | 0.013 kg/ha | 5% |
| Zinc (Zn) | 39 ppm | 2.258 kg/ha | 2.258 kg/ha | 7% |

### *Total Solids*

This application: 4.7 tonne/ha

Total applied over regulated time period: 4.7 tonne/ha (21% of 5 year limit)

### *Phosphate*

| Cropping Year | P2O5 Crop Removal Balance |
|---|---|
| Fall 2018 - Fall 2019 | 193 kg/ha |

Net P2O5 balance over regulated time period: 193 kg/ha (49% of 5 year limit)

## NASM Minimum Setback Summary

Incorporation Details: Not Incorporated Standing Crop

| | |
|---|---|
| *Wells* | |
| Municipal Well | 100 m |
| Drilled Well (15 m deep, 6 m casing) | 15 m |
| Other Well | 90 m |
| *Surface Water* | |
| No vegetated buffer | 20 m |
| *Odour* | |
| Single Dwelling | 90 m |
| Residential Area, Commercial, Community or Institutional | 450 m |

## Waiting Periods

Pre-Harvest Waiting Period After Application

| *Crop* | *Waiting Period* |
|---|---|
| Commercial sod | 12 months |
| Hay and haylage | 3 weeks |
| Tree fruits and grapes | 3 months |
| Small fruits | 15 months |
| Vegetables | 12 months |
| Tobacco | 12 months |

Pre-Grazing Waiting Period After Application

| *Livestock Type* | *Waiting Period* |
|---|---|
| Horses, beef or dairy cattle | 2 months |
| Swine, sheep or goats | 6 months |

## Depth of Unsaturated Soil

| *Depth* | *Restrictions* |
|---|---|
| < 30 cm | No application is permitted |
| 30 - 60 cm | Application is permitted if: 1) the land is pre-tilled no more than 7 days before the application AND 2) the maximum application rate is 40 m³/ha per 48 hours. |
| 61 - 90 cm | Application is permitted if: 1) the land is pre-tilled no more than 7 days before the application OR 2) the maximum application rate is 40 m³/ha per 48 hours. |
| > 90 cm | No restrictions |

## Post Application Report Attachments

Material Sample Analysis Results

Attach and clearly label the NASM analytical test results. Each NASM sample must be collected, transported and analyzed in accordance with the Sampling and Analysis Protocol. Provide a sample key if required. The number of sample results must comply with Part IX: Sampling, Analysis and Quality Standards and Land Application Rates in Ontario Regulation 267/03.

In the current release of NMAN3, the user must average sample results outside of NMAN3 and enter in the average value into NMAN3. Although not required, it is recommended that a summary table of NASM results also be attached which lists out the individual sample results by date and includes the calculated averages used in NMAN3. This summary table will help to speed up the review of the NASM plan as all calculations must be checked.

Soil Sample Results

If new or additional soil analysis has been carried out for the NASM application area since the approval of the NASM plan or the registration of the operation, include those analyses with this document. Each soil sample must be collected, transported and analyzed in accordance with the Sampling and Analysis Protocol.

Maps/Sketches

Post application sketch(es) are based on actual land application activities and conditions that existed at the time of land application. The sketch(es) must address the presence or absence of the following components, and include the separation distances put in place to protect sensitive features:

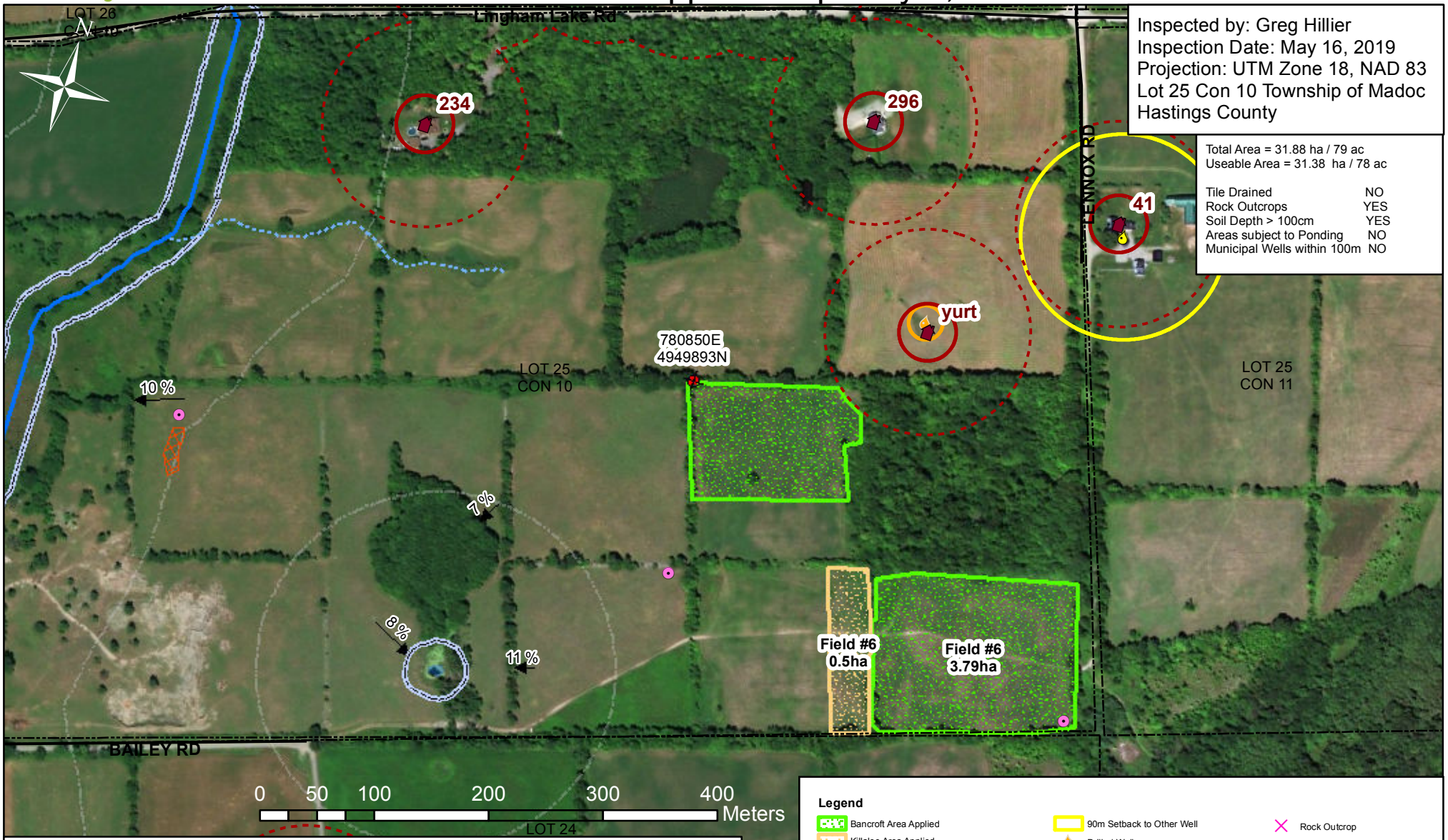
- field identifier, field boundaries and sections within the field
- field tile drains and the location of the tile inlets and tile outlets
- areas where the soil depth is less than 30 cm and rock outcrops
- areas subject to ponding
- location of dwellings, residential areas and areas of commercial, community or institutional land uses
- location of any municipal wells within 100 metres of the NASM application area
- location of all other known wells within 90 metres of the NASM application area
- location of all surface water within 150 metres of the NASM application area
- maximum sustained slopes within 150 metres of surface water

List of Attachments:

Required Sampling and Analysis results
Maps/Sketches

terrapure
Organics Solutions

# Trotter - Home Farm
# Area Applied Map: July 2, 2019




Inspected by: Greg Hillier
Inspection Date: May 16, 2019
Projection: UTM Zone 18, NAD 83
Lot 25 Con 10 Township of Madoc
Hastings County

Total Area = 31.88 ha / 79 ac
Useable Area = 31.38 ha / 78 ac

| | |
|---|---|
| Tile Drained | NO |
| Rock Outcrops | YES |
| Soil Depth > 100cm | YES |
| Areas subject to Ponding | NO |
| Municipal Wells within 100m | NO |

**Legend**

- Bancroft Area Applied
- Killaloe Area Applied
- Unuseable Area - Slope
- Residence
- 25m Setback to Residence
- 90m Setback to Residence (OC2 Surface)
- Community Center
- 50m Setback to Community Property
- 450m Setback to Comm Property (OC2 Surface)
- Other Well
- 90m Setback to Other Well
- Drilled Well
- 15m Setback to Drilled Well
- SurfaceWater
- Seasonal Drainage
- Surface Water
- 20m Setback to Surface Water
- 150m to Surface Water (dashed white line)
- Slope Direction
- Rock Outcrop
- Test Hole - Soil depth >100cm
- Roads
- Barn or Shed
- Lots & Cons
- GPS Location
- Field Access

Notes:
1. All residences within 90m of the farm unit are identified on the map.
2. There is a commercial, community or institutional use within 450m of the farm unit. There are no residential areas within 450m.
3. All surface water within 150m of the farm unit is identified on the map.
4. There are no other known wells within 90m of the farm unit.
5. The Maximum Sustained Slope within 150m of Surface Water is 8%
6. The site is not tile drained. There are no tile inlets or outlets on the farm unit.

## General Information

Any false or misleading information included in this document may result in non-compliance with any approvals or permits granted, and prosecution in accordance to the provisions of the Nutrient Management Act, 2002.

### *Compliance with Regulatory Standards*

The evaluation performed when generating this Post Application Report assumes that all sources of nutrients, including fertilizers, intended for land application on this field have been included when preparing the NASM plan.

Based on the data supplied in this Post Application Report, the land application practices described in this document are in compliance with regulatory standards.

### *List of Attachments*

Required Sampling and Analysis Results
Maps/Sketchs

## Preparer Information

Greg Hillier (#17314)
Terrapure Organics Solutions
1250 Thornton Rd. South
Oshawa, ON, Canada L1J 7E2
Phone #1: 905-242-1470
Email: ghillier@terrapureenv.com

## Agricultural Operation Information

Federal Business Number:

Operation Type: Sole Proprietorship

Operator Contact Information

Dylan Trotter
29 Bailey Road
Madoc, ON, Canada K0K 2K0
Phone #1: 613-813-6300

Owner is the same as the operator

## Material Source Summary

### *Killaloe 2019*

Form: Liquid

Category: 3
NASM Type: 11b. Liquid aerobically digested sewage biosolids
Material Generator: Township of Killaloe, Hagarty & Richards
1 John Street
Killaloe, ON, Canada K0J 2A0
Phone #1: 613-757-2300

Metals Content (CM) Level: CM2 (confirmed by lab analysis)
Pathogen Content (CP) Level: CP2 (confirmed by lab analysis)
Odour Category (OC): OC2

Beneficial Use

Total Concentration of PAN, PAP, and PAK:1891 ppm (Wet Basis)

Wet Basis

| Nutrient | Value | |
|---|---|---|
| Dry Matter (DM) | 3.625 % | |
| Nitrogen (Total Kjeldhal Nitrogen) | 0.227 % | |
| Ammonia + Ammonium Nitrogen | 20.5 ppm | |
| Nitrate + Nitrite Nitrogen | < 0.58 ppm | |
| Phosphorus (P) | 0.1033 % | |
| Potassium (K) | 0.023 % | |
| Arsenic (As) | 0.05 ppm | CM1 |
| Cadmium (Cd) | 0.025 ppm | CM1 |
| Cobalt (Co) | 0.07 ppm | CM1 |
| Chromium (Cr) | 0.41 ppm | CM1 |
| Copper (Cu) | 42.8 ppm | CM2 |
| Mercury (Hg) | 0.011 ppm | CM1 |
| Molybdenum (Mo) | 0.21 ppm | CM2 |
| Nickel (Ni) | 0.56 ppm | CM1 |
| Lead (Pb) | 0.55 ppm | CM1 |
| Selenium (Se) | 0.1 ppm | CM2 |
| Zinc (Zn) | 17.5 ppm | CM1 |
| E. coli | 5242154 CFU/100ml | CP2 |

## Farm Unit Summary

### *Home*

This farm:
- Generates ASM
- Receives ASM
- Receives Commercial Fertilizer
- Receives NASM

Status: Owned

Farm Location
County of Hastings, Township of Madoc
MADOC, Concession: 10, Lot: 25 (Generates ASM)

Roll Number(s) 123600001514000

911 Address:

## Field Summary

### *Field 6, Killaloe'19*

Area for Material: 0.5 ha
Planned Material Application Frequency: Three of Every Five Years

| **(Fall 2018 - Fall 2019)** | Agronomic (kg/ha) N | Agronomic (kg/ha) P2O5 | Agronomic (kg/ha) K2O | Crop Removal (kg/ha) N | Crop Removal (kg/ha) P2O5 | Crop Removal (kg/ha) K2O |
|---|---|---|---|---|---|---|
| **Hay, alfalfa (3 cuts) @ 7.8 tonne/ha**<br>Planted: May 1, 2019<br>Harvested: September 1, 2019 | 0 | -90 | -20 | -244 | -51 | -233 |
| **Material App 5**<br>July 2, 2019 (actual)<br>Killaloe 2019 @ 80 m³/ha<br>Total Applied: 40 m³<br>Tanker, Not Incorporated Standing Crop | 55 | 76 | 20 | 55 | 151 | 20 |
| **Nutrient Balance**<br>September 1, 2018 - August 31, 2019 | 55 | -14 | 0 | -189 | 100 | -213 |

## NASM Application Summary

### *Regulated Soil Parameters*

1 addition(s) over regulated time period

Soil Test Date: May 9, 2019

P Soil Test: 6 ppm

pH Soil Test: 7.4

| Regulated Metal | Soil Test | This Application | Total Applied | 5 Year Limit |
|---|---|---|---|---|
| Arsenic (As) | 2.1 ppm | 0.004 kg/ha | 0.004 kg/ha | 0% |
| Cadmium (Cd) | 0.22 ppm | 0.002 kg/ha | 0.002 kg/ha | 1% |
| Cobalt (Co) | 8.7 ppm | 0.006 kg/ha | 0.006 kg/ha | 0% |
| Chromium (Cr) | 23 ppm | 0.033 kg/ha | 0.033 kg/ha | 0% |
| Copper (Cu) | 12 ppm | 3.424 kg/ha | 3.424 kg/ha | 25% |
| Mercury (Hg) | < 0.05 ppm | 0.001 kg/ha | 0.001 kg/ha | 1% |
| Molybdenum (Mo) | 0.2 ppm | 0.017 kg/ha | 0.017 kg/ha | 2% |
| Nickel (Ni) | 17 ppm | 0.045 kg/ha | 0.045 kg/ha | 1% |
| Lead (Pb) | 8.1 ppm | 0.044 kg/ha | 0.044 kg/ha | 0% |
| Selenium (Se) | < 0.7 ppm | 0.008 kg/ha | 0.008 kg/ha | 3% |
| Zinc (Zn) | 44 ppm | 1.4 kg/ha | 1.4 kg/ha | 4% |

### *Total Solids*

This application: 2.9 tonne/ha

Total applied over regulated time period: 2.9 tonne/ha (13% of 5 year limit)

### *Phosphate*

| Cropping Year | P2O5 Crop Removal Balance |
|---|---|
| Fall 2018 - Fall 2019 | 100 kg/ha |

Net P2O5 balance over regulated time period: 100 kg/ha (26% of 5 year limit)

## NASM Minimum Setback Summary

Incorporation Details: Not Incorporated Standing Crop

| | |
|---|---|
| *Wells* | |
| Municipal Well | 100 m |
| Drilled Well (15 m deep, 6 m casing) | 15 m |
| Other Well | 90 m |
| *Surface Water* | |
| No vegetated buffer | 20 m |
| *Odour* | |
| Single Dwelling | 90 m |
| Residential Area, Commercial, Community or Institutional | 450 m |

## Waiting Periods

Pre-Harvest Waiting Period After Application

| *Crop* | *Waiting Period* |
|---|---|
| Commercial sod | 12 months |
| Hay and haylage | 3 weeks |
| Tree fruits and grapes | 3 months |
| Small fruits | 15 months |
| Vegetables | 12 months |
| Tobacco | 12 months |

Pre-Grazing Waiting Period After Application

| *Livestock Type* | *Waiting Period* |
|---|---|
| Horses, beef or dairy cattle | 2 months |
| Swine, sheep or goats | 6 months |

## Depth of Unsaturated Soil

| *Depth* | *Restrictions* |
|---|---|
| < 30 cm | No application is permitted |
| 30 - 60 cm | Application is permitted if: 1) the land is pre-tilled no more than 7 days before the application AND 2) the maximum application rate is 40 m³/ha per 48 hours. |
| 61 - 90 cm | Application is permitted if: 1) the land is pre-tilled no more than 7 days before the application OR 2) the maximum application rate is 40 m³/ha per 48 hours. |
| > 90 cm | No restrictions |

## Post Application Report Attachments

Material Sample Analysis Results

Attach and clearly label the NASM analytical test results. Each NASM sample must be collected, transported and analyzed in accordance with the Sampling and Analysis Protocol. Provide a sample key if required. The number of sample results must comply with Part IX: Sampling, Analysis and Quality Standards and Land Application Rates in Ontario Regulation 267/03.

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Soil Sample Results

If new or additional soil analysis has been carried out for the NASM application area since the approval of the NASM plan or the registration of the operation, include those analyses with this document. Each soil sample must be collected, transported and analyzed in accordance with the Sampling and Analysis Protocol.

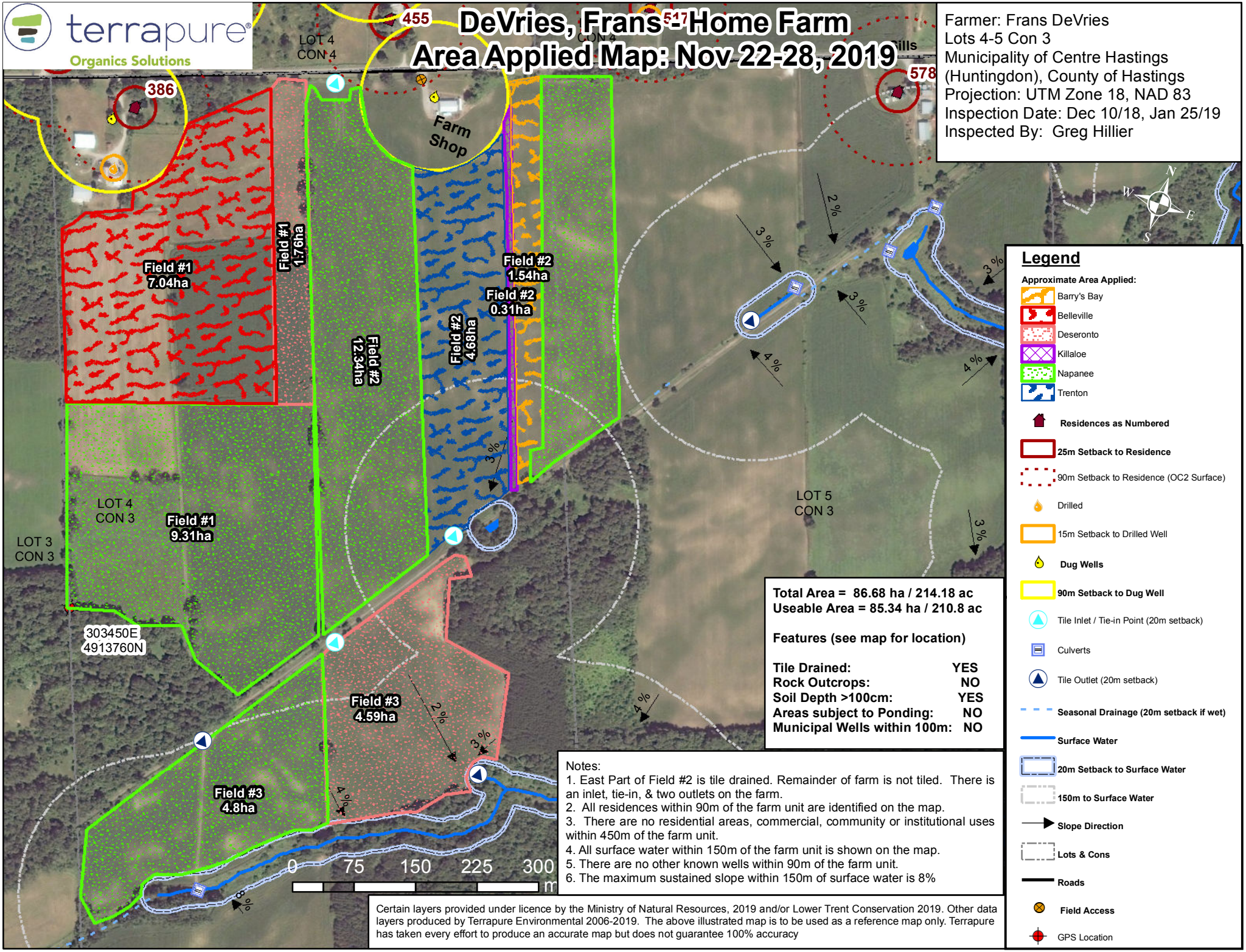
Maps/Sketches

Post application sketch(es) are based on actual land application activities and conditions that existed at the time of land application. The sketch(es) must address the presence or absence of the following components, and include the separation distances put in place to protect sensitive features:

- field identifier, field boundaries and sections within the field
- field tile drains and the location of the tile inlets and tile outlets
- areas where the soil depth is less than 30 cm and rock outcrops
- areas subject to ponding
- location of dwellings, residential areas and areas of commercial, community or institutional land uses
- location of any municipal wells within 100 metres of the NASM application area
- location of all other known wells within 90 metres of the NASM application area
- location of all surface water within 150 metres of the NASM application area
- maximum sustained slopes within 150 metres of surface water

List of Attachments:

Required Sampling and Analysis results
Maps/Sketches


terrapure
Organics Solutions
DeVries, Frans - Home Farm
Area Applied Map: Nov 22-28, 2019
Farmer: Frans DeVries
Lots 4-5 Con 3
Municipality of Centre Hastings
(Huntingdon), County of Hastings
Projection: UTM Zone 18, NAD 83
Inspection Date: Dec 10/18, Jan 25/19
Inspected By: Greg Hillier
LOT 4 CON 4
LOT 5 CON 3
LOT 4 CON 3
LOT 3 CON 3
Farm Shop
386
455
517
578
Field #1 7.04ha
Field #1 1.76ha
Field #2 12.34ha
Field #2 4.68ha
Field #2 1.54ha
Field #2 0.31ha
Field #1 9.31ha
Field #3 4.59ha
Field #3 4.8ha
303450E
4913760N
2 %
3 %
4 %
0 75 150 225 300 m
Total Area = 86.68 ha / 214.18 ac
Useable Area = 85.34 ha / 210.8 ac
Features (see map for location)
Tile Drained: YES
Rock Outcrops: NO
Soil Depth >100cm: YES
Areas subject to Ponding: NO
Municipal Wells within 100m: NO
Notes:
1. East Part of Field #2 is tile drained. Remainder of farm is not tiled. There is an inlet, tie-in, & two outlets on the farm.
2. All residences within 90m of the farm unit are identified on the map.
3. There are no residential areas, commercial, community or institutional uses within 450m of the farm unit.
4. All surface water within 150m of the farm unit is shown on the map.
5. There are no other known wells within 90m of the farm unit.
6. The maximum sustained slope within 150m of surface water is 8%
Certain layers provided under licence by the Ministry of Natural Resources, 2019 and/or Lower Trent Conservation 2019. Other data layers produced by Terrapure Environmental 2006-2019. The above illustrated map is to be used as a reference map only. Terrapure has taken every effort to produce an accurate map but does not guarantee 100% accuracy
Legend
Approximate Area Applied:
Barry's Bay
Belleville
Deseronto
Killaloe
Napanee
Trenton
Residences as Numbered
25m Setback to Residence
90m Setback to Residence (OC2 Surface)
Drilled
15m Setback to Drilled Well
Dug Wells
90m Setback to Dug Well
Tile Inlet / Tie-in Point (20m setback)
Culverts
Tile Outlet (20m setback)
Seasonal Drainage (20m setback if wet)
Surface Water
20m Setback to Surface Water
150m to Surface Water
Slope Direction
Lots & Cons
Roads
Field Access
GPS Location

# NASM Plan Post Application Report

**DeVries, Frans (April 1, 2019 - December 31, 2023; Killaloe 2019; DeVries Home, Field 2)**

**Submission ID: 23774**

## General Information

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### *Compliance with Regulatory Standards*

The evaluation performed when generating this Post Application Report assumes that all sources of nutrients, including fertilizers, intended for land application on this field have been included when preparing the NASM plan.

Based on the data supplied in this Post Application Report, the land application practices described in this document are in compliance with regulatory standards.

### *List of Attachments*

Required Sampling and Analysis Results
Maps/Sketchs

## Preparer Information

Greg Hillier (#17314)
Terrapure Environmental
1250 Thornton Rd. South
Oshawa, ON, Canada L1J 7E2
Phone #1: 905-242-1470
Email: ghillier@terrapureenv.com

## Agricultural Operation Information

Federal Business Number:

Operation Type: Sole Proprietorship

Operator Contact Information
Frans DeVries
578 Sills Rd
Stirling, ON, Canada K0K 3E0
Phone #1: 306-547-7235

Owner is the same as the operator

## Material Source Summary

### *Killaloe 2019*

Form: Liquid

Category: 3
NASM Type: 11b. Liquid aerobically digested sewage biosolids
Material Generator: Township of Killaloe, Hagarty & Richards
1 John Street
Killaloe, ON, Canada K0J 2A0
Phone #1: 613-757-2300

Metals Content (CM) Level: CM2 (confirmed by lab analysis)
Pathogen Content (CP) Level: CP2 (confirmed by lab analysis)
Odour Category (OC): OC2

Beneficial Use
Total Concentration of PAN, PAP, and PAK:1588 ppm (Wet Basis)

Wet Basis

| Nutrient | Value | |
|---|---|---|
| Dry Matter (DM) | 2.8075 % | |
| Nitrogen (Total Kjeldhal Nitrogen) | 0.175 % | |
| Ammonia + Ammonium Nitrogen | 12.9 ppm | |
| Nitrate + Nitrite Nitrogen | < 0.4 ppm | |
| Phosphorus (P) | 0.0885 % | |
| Potassium (K) | 0.0225 % | |
| Arsenic (As) | 0.05 ppm | CM1 |
| Cadmium (Cd) | 0.024 ppm | CM1 |
| Cobalt (Co) | 0.05 ppm | CM1 |
| Chromium (Cr) | 0.41 ppm | CM1 |
| Copper (Cu) | 39.8 ppm | CM2 |
| Mercury (Hg) | 0.012 ppm | CM1 |
| Molybdenum (Mo) | 0.19 ppm | CM2 |
| Nickel (Ni) | 0.46 ppm | CM1 |
| Lead (Pb) | 0.5 ppm | CM1 |
| Selenium (Se) | 0.1 ppm | CM2 |
| Zinc (Zn) | 17.25 ppm | CM2 |
| E. coli | 1810134 CFU/100ml | CP2 |

## Farm Unit Summary

### *DeVries Home*

This farm:
Receives Commercial Fertilizer
Receives NASM

Status: Owned

Farm Location
County of Hastings, Municipality of Centre Hastings
HUNTINGDON, Concession: 3, Lot: 4
HUNTINGDON, Concession: 3, Lot: 5

Roll Number(s) 123022401507200
123022401507000
123022401506900

911 Address: 578 Sills Road

## Field Summary

### *Field 2*

Area for Material: 0.31 ha
Planned Material Application Frequency: Two of Every Five Years

| **(Fall 2018 - Fall 2020)** | Agronomic (kg/ha) N | P2O5 | K2O | Crop Removal (kg/ha) N | P2O5 | K2O |
|---|---|---|---|---|---|---|
| **Corn, grain @ 0 tonne/ha**<br>Planted: May 1, 2019<br>Harvested: October 25, 2019 | -33 | 0 | -80 | 0 | 0 | 0 |
| **Nutrient Balance**<br>September 1, 2018 - October 24, 2019 | -33 | 0 | -80 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Material App 5**<br>November 29, 2019 (actual)<br>Killaloe 2019 @ 130 m³/ha<br>Total Applied: 40 m³<br>Tanker, Incorporated 1 day | 96 | 105 | 32 | 96 | 211 | 32 |
| **Soybeans @ 2.3 tonne/ha**<br>Planted: May 15, 2020<br>Harvested: October 1, 2020 | 0 | 0 | -60 | -148 | -32 | -54 |
| **Nutrient Balance**<br>October 25, 2019 - September 30, 2020 | 96 | 105 | -28 | -52 | 179 | -22 |
| **Multi-Year Nutrient Balance**<br>September 1, 2018 - September 30, 2020 | 63 | 105 | -108 | -52 | 179 | -22 |

## NASM Application Summary

### *Regulated Soil Parameters*

1 addition(s) over regulated time period

Soil Test Date: January 11, 2019

P Soil Test: 44 ppm

pH Soil Test: 6.1

| Regulated Metal | Soil Test | This Application | Total Applied | 5 Year Limit |
|---|---|---|---|---|
| Arsenic (As) | 1.8 ppm | 0.007 kg/ha | 0.007 kg/ha | 0% |
| Cadmium (Cd) | 0.17 ppm | 0.003 kg/ha | 0.003 kg/ha | 1% |
| Cobalt (Co) | 3.4 ppm | 0.007 kg/ha | 0.007 kg/ha | 0% |
| Chromium (Cr) | 12 ppm | 0.053 kg/ha | 0.053 kg/ha | 0% |
| Copper (Cu) | 14 ppm | 5.174 kg/ha | 5.174 kg/ha | 38% |
| Mercury (Hg) | < 0.05 ppm | 0.002 kg/ha | 0.002 kg/ha | 2% |
| Molybdenum (Mo) | 0.3 ppm | 0.025 kg/ha | 0.025 kg/ha | 3% |
| Nickel (Ni) | 7 ppm | 0.06 kg/ha | 0.06 kg/ha | 2% |
| Lead (Pb) | 8 ppm | 0.065 kg/ha | 0.065 kg/ha | 1% |
| Selenium (Se) | < 0.7 ppm | 0.013 kg/ha | 0.013 kg/ha | 5% |
| Zinc (Zn) | 36 ppm | 2.243 kg/ha | 2.243 kg/ha | 7% |

### *Total Solids*

This application: 3.6 tonne/ha

Total applied over regulated time period: 3.6 tonne/ha (17% of 5 year limit)

### *Phosphate*

| Cropping Year | P2O5 Crop Removal Balance |
|---|---|
| Fall 2018 - Fall 2019 | 0 kg/ha |
| Fall 2019 - Fall 2020 | 179 kg/ha |

Net P2O5 balance over regulated time period: 179 kg/ha (46% of 5 year limit)

## NASM Minimum Setback Summary

Incorporation Details: Incorporated 1 day

| | |
|---|---|
| *Wells* | |
| Municipal Well | 100 m |
| Drilled Well (15 m deep, 6 m casing) | 15 m |
| Other Well | 90 m |
| *Surface Water* | |
| No vegetated buffer | 20 m |
| *Odour* | |
| Single Dwelling | 90 m (25 m if incorporated < 6 hrs) |
| Residential Area, Commercial, Community or Institutional | 450 m (50 m if incorporated < 6 hrs) |

## Waiting Periods

Pre-Harvest Waiting Period After Application

| *Crop* | *Waiting Period* |
|---|---|
| Commercial sod | 12 months |
| Hay and haylage | 3 weeks |
| Tree fruits and grapes | 3 months |
| Small fruits | 15 months |
| Vegetables | 12 months |
| Tobacco | 12 months |

Pre-Grazing Waiting Period After Application

| *Livestock Type* | *Waiting Period* |
|---|---|
| Horses, beef or dairy cattle | 2 months |
| Swine, sheep or goats | 6 months |

## Depth of Unsaturated Soil

| *Depth* | *Restrictions* |
|---|---|
| < 30 cm | No application is permitted |
| 30 - 60 cm | Application is permitted if: 1) the land is pre-tilled no more than 7 days before the application AND 2) the maximum application rate is 40 m³/ha per 48 hours. |
| 61 - 90 cm | Application is permitted if: 1) the land is pre-tilled no more than 7 days before the application OR 2) the maximum application rate is 40 m³/ha per 48 hours. |
| > 90 cm | No restrictions |

## Post Application Report Attachments

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Soil Sample Results

If new or additional soil analysis has been carried out for the NASM application area since the approval of the NASM plan or the registration of the operation, include those analyses with this document. Each soil sample must be collected, transported and analyzed in accordance with the Sampling and Analysis Protocol.

Maps/Sketches

Post application sketch(es) are based on actual land application activities and conditions that existed at the time of land application. The sketch(es) must address the presence or absence of the following components, and include the separation distances put in place to protect sensitive features:

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- field tile drains and the location of the tile inlets and tile outlets
- areas where the soil depth is less than 30 cm and rock outcrops
- areas subject to ponding
- location of dwellings, residential areas and areas of commercial, community or institutional land uses
- location of any municipal wells within 100 metres of the NASM application area
- location of all other known wells within 90 metres of the NASM application area
- location of all surface water within 150 metres of the NASM application area
- maximum sustained slopes within 150 metres of surface water

List of Attachments:

Required Sampling and Analysis results
Maps/Sketches