Killaloe Wastewater System

2014 Annual Report

January 1, 2014 – December 31, 2014

Prepared By
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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.

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Compliance Report Card

Compliance Event	# of Events	Details
Ministry of Environment Inspections	1	Inspection completed October 8, 2014. Report received November 25, 2014. No actions required
Ministry of Labour Inspections	0	
Effluent Parameter Exceedances	0	
Bypass/Overflows	0	
Community Complaints	2	See “Summary of Complaints” section of this report
Spills	0	

System/Process Description

The Killaloe Wastewater Treatment System consists of a sewage treatment plant and one sewage pumping station. In the event of a power failure, emergency power is supplied from the main treatment facility to the pumping station.

Sewage collects from the Village of Killaloe at the pumping station which is then pumped to the treatment facility located at 113 Keetch Street.

Primary Treatment

Once the raw sewage reaches the plant it is discharged into the grit channels. The flow through the channels is slowed down to allow the grit to settle. The settled grit is manually removed from the channel. The flow is measured using a v-notch weir.

Chemical Addition

Phas 8 is added to optimize nutrient removal. It is added at the end of the aeration process and ahead of the clarifier tank. This chemical reacts with phosphates in the sewage and forms an insoluble phosphate which settles out in the clarifier.

Secondary Treatment

The influent water which is still carrying suspended and dissolved wastes, is then biologically treated using the extended aeration process. The flow travels from the grit channels to aeration tanks. The coarse aerators supply oxygen to the aeration tank and provide mixing creating mixed liquor.

The flow continues to the clarifier which allows settling. The activated sludge which settles to the bottom of the clarifier is either returned to the head of the aeration tank or is diverted to the digester. The clear water (final effluent) remaining after the clarifier, overflow the clarifier weirs and is collected in the channel leading to the chorine contact chamber. Here Sodium Hypochlorite (a chlorine solution) is added to disinfect the effluent. A clear, virtually bacteria-free water then flows into Brenann's Creek.

Solids Handling

Sludge collected in the clarifier is further processed (stabilized) in an aerobic digester and is spread on agricultural land during the summer months(April 1- November 30). In winter months (December 1 – March 31), sludge is stored in the holding tank (approx.150 m3) until the weather conditions and regulations permit spreading.

Proposed Alterations, Extensions, or Replacement to Works

There were no major proposed alterations, extensions or replacements completed at the works in 2014.

Effluent Quality Assurance or Control Measures

The Township of Killaloe, Hagarty and Richards facilities are part of OCWA's operational Ottawa Valley Hub. The facilities are supported by hub, regional and corporate resources. Operational Services are delivered by OCWA staff who live and work in the area.

OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.

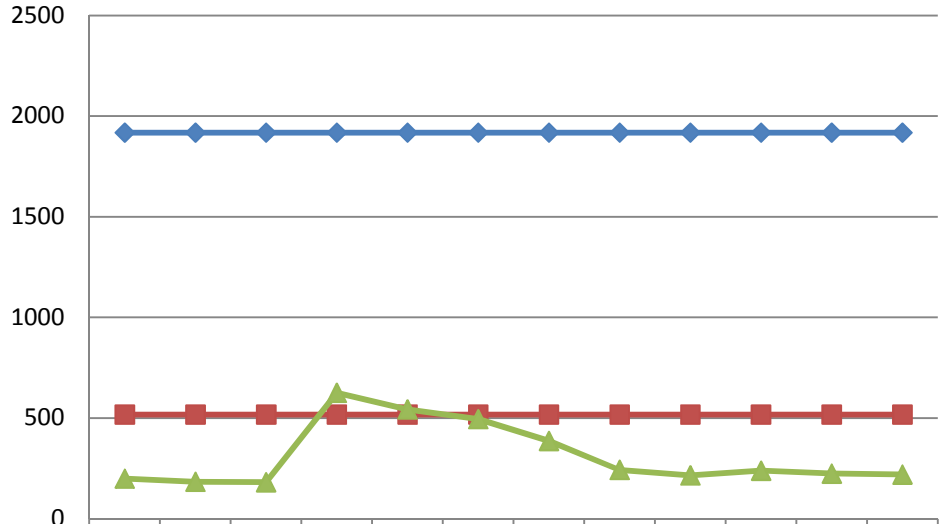
OCWA has additional "Value Added" and operational support services that the Township of Killaloe, Hagarty and Richards benefits from including:

- Access to a network of operational compliance and support experts at the regional and corporate level, as well as affiliated programs that include the following:
    - Quality & Environmental Management System, Occupational Health & Safety System and an internal compliance audit system.
    - Process Data Collection (PDC) facility operating information repository, which consolidates field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.
    - Work Management System (WMS) that tracks and reports maintenance activities, and creates predictive and preventative reports.
    - Outpost 5 wide-area SCADA system allows for process optimization and data logging, process trending, remote alarming and optimization of staff time.
- Client reporting which includes operational data, equipment inventory, financial statements, maintenance work orders, and capital status reports
- Site-Specific Contingency Plans and Standard Operating Procedures
- Use of accredited laboratories
- Access to a network of operational compliance and support experts at the hub, region and corporate level
- Additional support in response to unusual circumstances, and extra support in an emergency.
- Use of sampling schedules for external laboratory sampling

Treatment Flows

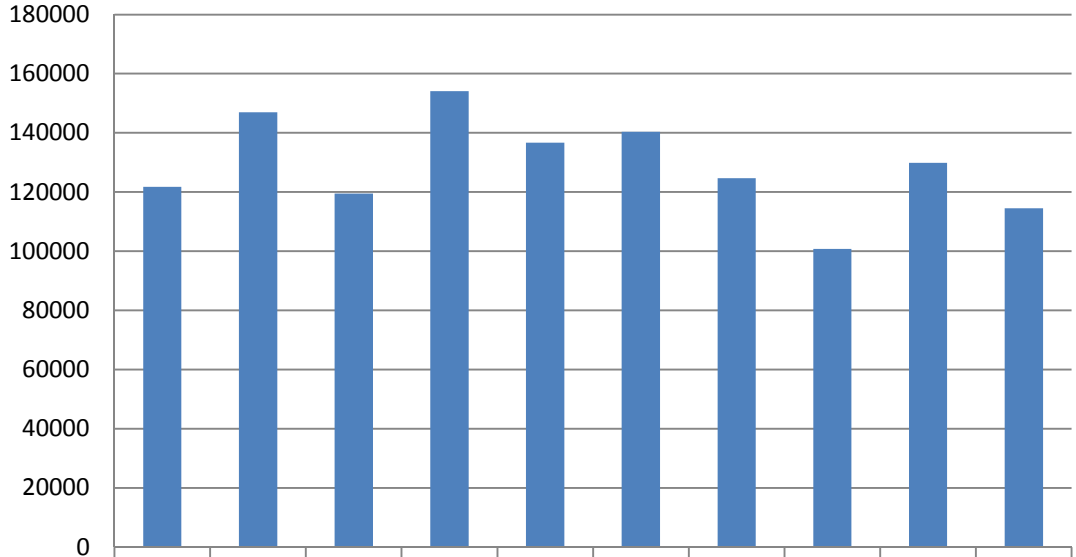
Raw Flow (m3/d)

Annual Average Flow (m3/d) = 313.5 m3/d



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max (m3/d)	1918	1918	1918	1918	1918	1918	1918	1918	1918	1918	1918	1918
Design (m3/d)	518	518	518	518	518	518	518	518	518	518	518	518
Average Daily Flow (m3/d)	199.9	184.3	181.5	626.0	543.6	495.4	387.2	243.4	216.1	239.3	224.6	220.2

Annual Comparison (m3)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Annual Flow	121720	146981	119494	154127	136667	140401	124631	100748	129853	114491

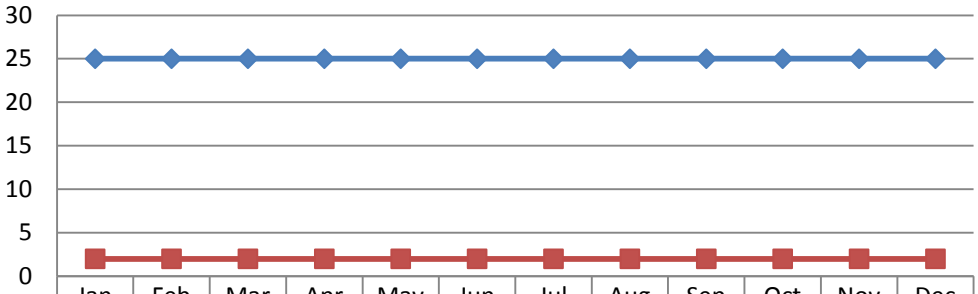
Effluent Quality

There is no certificate of approval or Environmental Compliance Approval for this facility. This facility operates to ensure current guidelines are not exceeded.

The Canadian Government is phasing in sewage regulations. This year additional sampling had to be collected to meet these regulations. The results are submitted to Environment Canada on a quarterly basis.

BOD5

Concentration (mg/L)

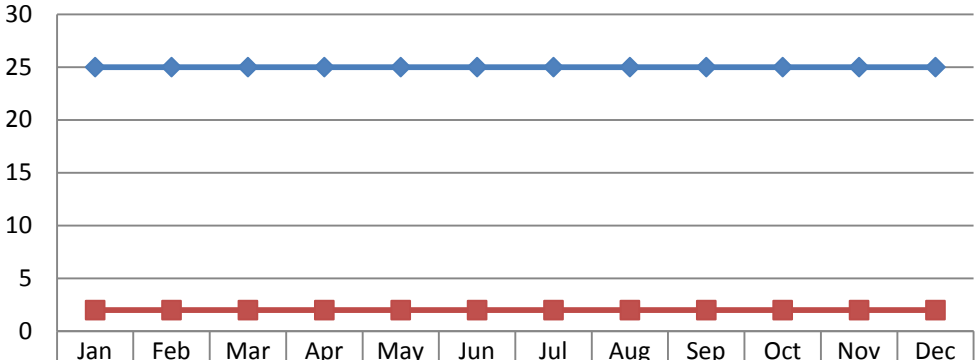


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	25	25	25	25	25	25	25	25	25	25	25	25
Average	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

CBOD

CBOD effluent samples were collected to satisfy the requirements of the Federal Regulations.

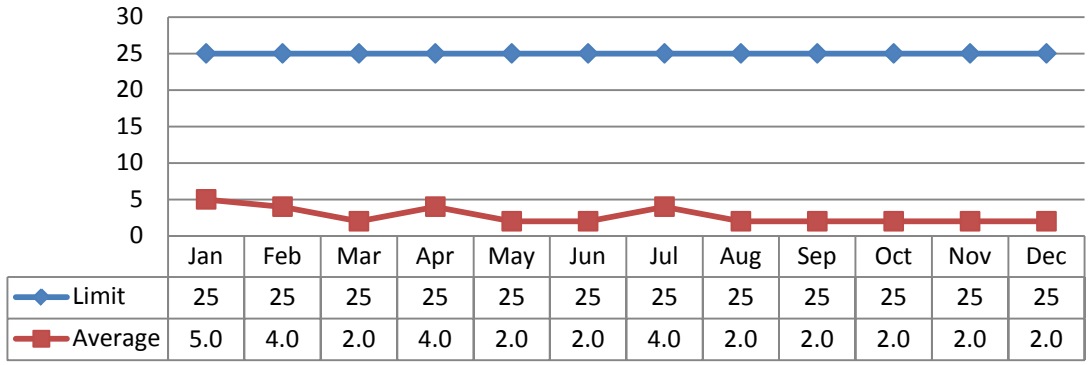
Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	25	25	25	25	25	25	25	25	25	25	25	25
Average	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Total Suspended Solids

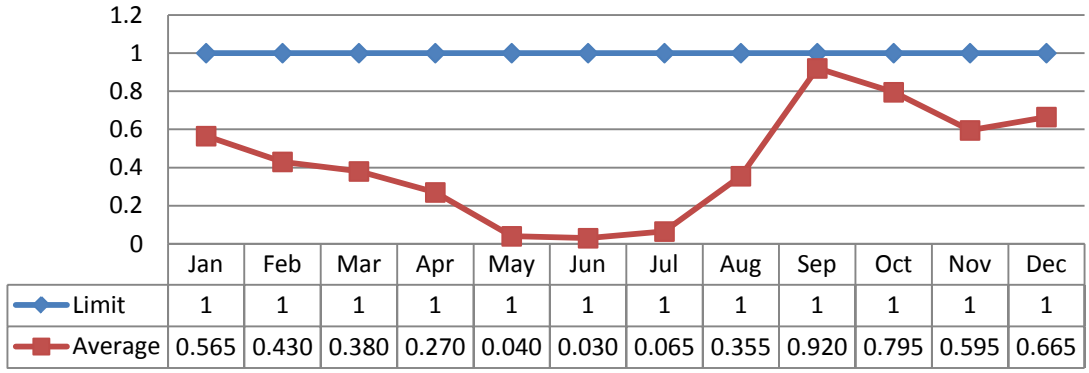
Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	25	25	25	25	25	25	25	25	25	25	25	25
Average	5.0	4.0	2.0	4.0	2.0	2.0	4.0	2.0	2.0	2.0	2.0	2.0

Total Phosphorus

Concentration (mg/L)

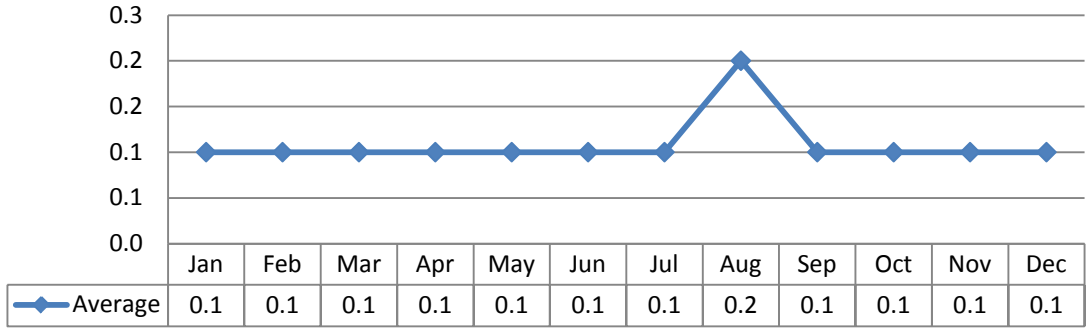


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	1	1	1	1	1	1	1	1	1	1	1	1
Average	0.565	0.430	0.380	0.270	0.040	0.030	0.065	0.355	0.920	0.795	0.595	0.665

Total Ammonia Nitrogen

There is no guideline limit on Ammonia Nitrogen.

Concentration (mg/L)



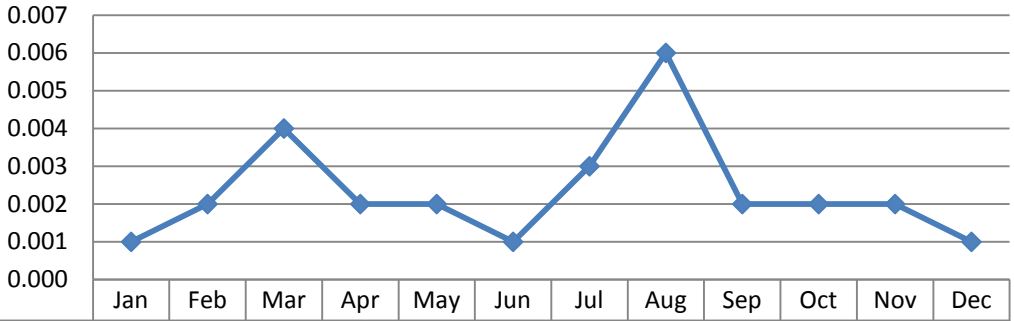
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1

Federal Unionized Ammonia

This parameter is required to be sampled under the Federal Regulation. This un-ionized ammonia is calculated differently than the provincial un-ionized ammonia in that the testing is completed at a

sample temperature of 15®C. Starting January 1, 2015 sampling will no longer be required for the Federal un-ionized ammonia.

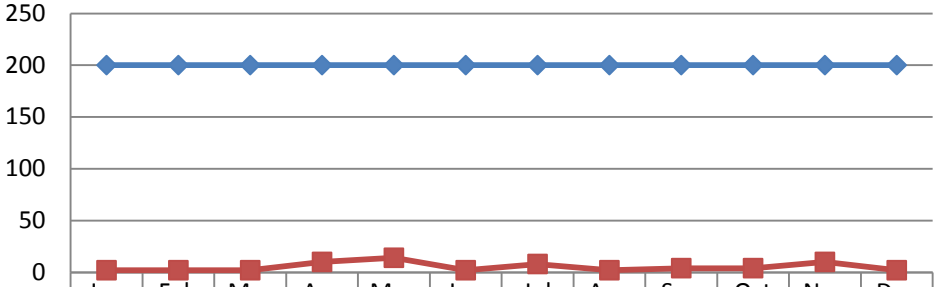
Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	0.001	0.002	0.004	0.002	0.002	0.001	0.003	0.006	0.002	0.002	0.002	0.001

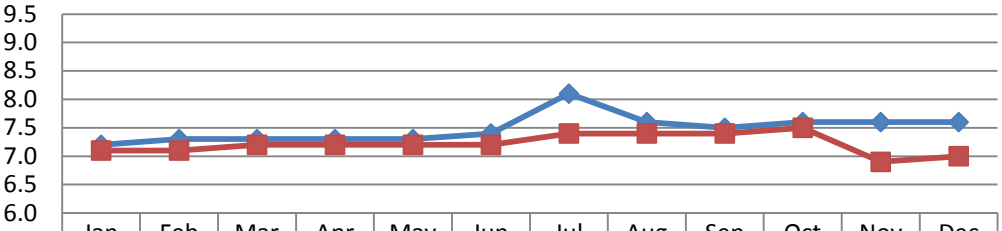
E-coli

Concentration (cfu/100mL)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	200	200	200	200	200	200	200	200	200	200	200	200
Geometric Mean Avg	2.0	2.0	2.0	10.0	14.0	2.0	8.0	2.0	4.0	4.0	10.0	2.0

pH



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Monthly pH	7.2	7.3	7.3	7.3	7.3	7.4	8.1	7.6	7.5	7.6	7.6	7.6
Min Monthly pH	7.1	7.1	7.2	7.2	7.2	7.2	7.4	7.4	7.4	7.5	6.9	7.0

Operating Problems

There were no operating problems to report on in 2014.

Biosolids

Sludge generated from the treatment plant is spread on agricultural land during the spreading season as per the Nutrient Management Act O.Reg 267/03.

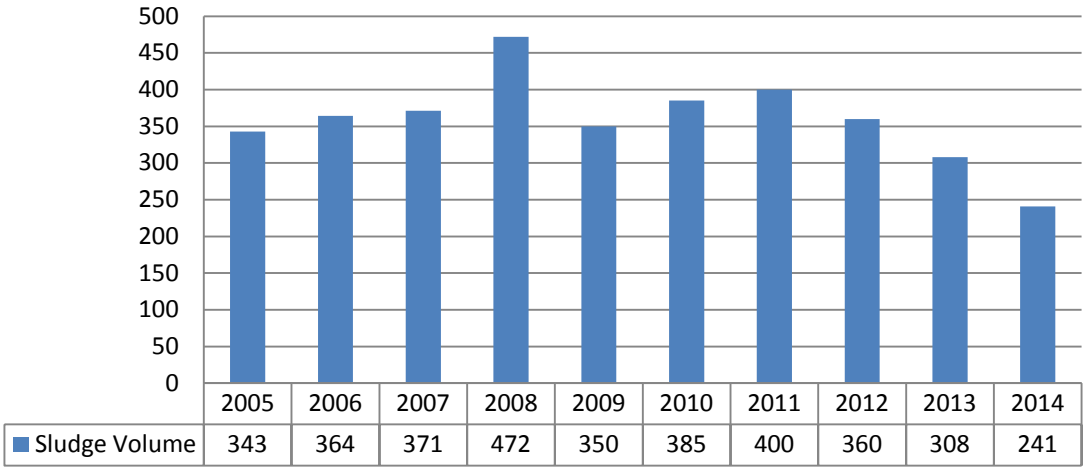
Site Name	NASM Plan #	Issued Date	Expiration Date
Sernoskie Field	21666	April 1, 2014	Revised September 21, 2014
Sernoskie Field	21666	September 21, 2014	December 31, 2018
Plant Site	21694	April 1, 2014	December 31, 2018

Biosolids Disposal Summary

NASM Post Application Reports are attached in Appendix B

Date	Volume (m3)	Disposal Location	Hauler	Waste Management #
August 19, 2014	80	21666	Terratec Environmental	A680209
September 24, 2014	161	21694	Terratec Environmental	A680209

Annual Comparison



Quality

The biosolids sampling results are summarized in Appendix C.

Summary of Complaints

The following were received community complaints related to the operations of the Killaloe WPCP and Collection System.

Date	Collection /Treatment	Nature of Complaint	Nature of Complaint
18-Dec-2014	Collection	Blocked Sewer	Contacted by Township employee regarding a possible blocked sewer between maintenance hole 5 and maintenance hole 6 on Creek Easement.

Date	Collection /Treatment	Nature of Complaint	Nature of Complaint
			Operators snaked the sewer line to remove blockage. Verified proper flows in collection, pumping station and treatment plant.
29-Dec-2014	Collection	Slow service	Upon investigation staff found restriction in line between maintenance hole 4 and maintenance hole 5 on Creek Easement. External contactor on-site to thoroughly flush sewer main.

Summary of Bypass/Overflows

There were no events reported for this system in 2014.

Summary of Spills/Abnormal Discharges

There were no spills or abnormal discharges from this system in 2014.

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 Ottawa Valley 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	79
Operational Maintenance Work Orders Completed	32
Weekly Maintenance Work Orders Completed	276
Corrective Maintenance Work Orders Completed	2

Maintenance Highlights

WO#	Details
3103938	New installation of PAS8 tanks
3182216	Chemical line replacement
3193102	Final stage of process air header replacement
3263205	Power flushing of Cameron street easement

Calibration

OCWA has certified Instrumentation Technician on staff, that completes the flow meter calibrations. Calibration of the effluent flow meter was completed May 15, 2014.

Appendix A

Facility Performance Report

Ontario Clean Water Agency
Performance Assessment Report Wastewater/Lagoon

Report extracted 01/16/2015 14:52 **From: 01/01/2014 to 01/01/2015**

Facility: [5539] KILLALOE WASTEWATER TREATMENT FACILITY

Works: [5539] KILLALOE WASTEWATER TREATMENT FACILITY

	01/2014	02/2014	03/2014	04/2014	05/2014	06/2014	07/2014	08/2014	09/2014	10/2014	11/2014	12/2014	<--Total-->	<--Avg.-->	<--Max.-->	<--Criteria-->
Flows:																
Raw Flow: Total - Raw (m³/d)	6197.000	5161.000	5628.000	18780.000	16851.000	14863.000	12002.000	7546.000	6482.000	7418.000	6737.000	6826.000	114491.000			
Raw Flow: Avg - Raw (m³/d)	199.903	184.321	181.548	626.000	543.581	495.433	387.161	243.419	216.067	239.290	224.567	220.194		313.457		
Raw Flow: Max - Raw (m³/d)	216.000	197.000	227.000	827.000	633.000	809.000	570.000	272.000	247.000	267.000	267.000	352.000			827.000	
Eff. Flow: Total - Effluent (m³/d)	6197.000	5161.000	5628.000	18780.000	16851.000	14963.000	12002.000	7546.000	6482.000	7418.000	6746.000	6826.000	114600.000			
Eff. Flow: Avg - Effluent (m³/d)	199.903	184.321	181.548	626.000	543.581	498.767	387.161	243.419	216.067	239.290	224.867	220.194		313.760		
Eff. Flow: Max - Effluent (m³/d)	216.000	197.000	227.000	827.000	633.000	813.000	570.000	272.000	247.000	267.000	267.000	352.000			827.000	
Carbonaceous Biochemical Oxygen Demand: CBOD:																
Eff: Avg cBOD5 - Effluent (mg/L)	< 2.000	< 2.000	2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000		< 2.000	2.000	25.000
Eff: # of samples of cBOD5 - Effluent	1.000	2.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	13.000			
Loading: cBOD5 - Effluent (kg/d)	< 0.400	< 0.369	0.363	< 1.252	< 1.087	< 0.998	< 0.774	< 0.487	< 0.432	< 0.479	< 0.450	< 0.440		< 0.628	1.252	
Biochemical Oxygen Demand: BOD5:																
Raw: Avg BOD5 - Raw (mg/L)	> 102.000	> 144.000	> 144.000	> 84.000	> 79.000	> 144.000	> 60.000	> 101.000	> 146.000	> 158.000	> 103.000	> 176.000		> 120.083	176.000	
Raw: # of samples of BOD5 - Raw	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	12.000			
Eff: Avg BOD5 - Effluent (mg/L)	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000	> 2.000		> 2.000	2.000	25.000
Eff: # of samples of BOD5 - Effluent	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	12.000			
Loading: BOD5 - Effluent (kg/d)	> 0.400	> 0.369	> 0.363	> 1.252	> 1.087	> 0.998	> 0.774	> 0.487	> 0.432	> 0.479	> 0.450	> 0.440		> 0.628	1.252	
Percent Removal: BOD5 - Raw (mg/L)	98.039	98.611	98.611	97.619	97.468	98.611	96.667	98.020	98.630	98.734	98.058	98.864			98.864	
Total Suspended Solids: TSS:																
Raw: Avg TSS - Raw (mg/L)	115.000	80.000	148.000	96.000	88.000	112.000	110.000	112.000	187.000	176.000	144.000	186.000		129.500	187.000	
Raw: # of samples of TSS - Raw	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	12.000			
Eff: Avg TSS - Effluent (mg/L)	5.000	4.000	< 2.000	4.000	2.000	< 2.000	4.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000		< 2.750	5.000	25.000
Eff: # of samples of TSS - Effluent	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	12.000			
Loading: TSS - Effluent (kg/d)	1.000	0.737	< 0.363	2.504	1.087	< 0.998	1.549	< 0.487	< 0.432	< 0.479	< 0.450	< 0.440		< 0.877	2.504	
Percent Removal: TSS - Raw (mg/L)	95.652	95.000	98.649	95.833	97.727	98.214	96.364	98.214	98.930	98.864	98.611	98.925			98.930	
Total Phosphorus: TP:																
Raw: Avg TP - Raw (mg/L)	3.590	3.640	4.760	3.180	2.490	3.240	1.730	3.200	4.470	4.390	4.500	3.190		3.532	4.760	
Raw: # of samples of TP - Raw	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	12.000			
Eff: Avg TP - Effluent (mg/L)	0.565	0.430	0.380	0.270	< 0.040	< 0.030	0.065	0.355	0.920	0.795	0.595	0.665		< 0.426	0.920	
Eff: # of samples of TP - Effluent	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	24.000			
Loading: TP - Effluent (kg/d)	0.113	0.079	0.069	0.169	< 0.022	< 0.015	0.025	0.086	0.199	0.190	0.134	0.146		< 0.104	0.199	
Percent Removal: TP - Raw (mg/L)	84.262	88.187	92.017	91.509	98.394	99.074	96.243	88.906	79.418	81.891	86.778	79.154			99.074	
Nitrogen Series:																
Raw: Avg TKN - Raw (mg/L)	41.600	35.300	43.200	32.800	22.900	32.900	11.300	30.000	40.100	43.400	41.100	36.400		34.250	43.400	
Raw: # of samples of TKN - Raw	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	12.000			
Eff: Avg TAN - Effluent (mg/L)	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.150	< 0.100	< 0.100	< 0.100	< 0.100		< 0.104	< 0.150	8.000
Eff: # of samples of TAN - Effluent	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	24.000			
Loading: TAN - Effluent (kg/d)	< 0.020	< 0.018	< 0.018	< 0.063	< 0.054	< 0.050	< 0.039	< 0.037	< 0.022	< 0.024	< 0.022	< 0.022		< 0.032	< 0.063	
Disinfection:																
Eff: GMD E. Coli - Effluent (cfu/100mL)	2.000	2.000	2.000	10.000	14.000	2.000	8.000	2.000	4.000	4.000	10.000	2.000		1.000	14.000	200.000
Eff: # of samples of E. Coli - Effluent	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	12.000			

Appendix B

NASM Plan Post Application Reports

NASM Plan Post Application Report

Sernoskie Farm (NASM 1; Conc 11,Lot 2/3, Field 1)

Submission ID: 21666

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 (#12045)
Terratec Environmental
1612 Baseline Road West
Courtice, ON, Canada L1E 2S5
Phone #1: 905-242-1470
Email: greg.hillier@amwater.com

Agricultural Operation Information

Federal Business Number:

Operation Type: Sole Proprietorship

Operator Contact Information
Alan Sernoskie
296 Long Meadows Road
Killaloe, ON, Canada K0J 2A0
Phone #1: 613-757-2277

Owner is the same as the operator

Material Source Summary

NASM 1

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: 1852 ppm (Wet Basis)

Wet Basis

Nutrient	Value	
Dry Matter (DM)	3.12 %	
Nitrogen (Total Kjeldhal Nitrogen)	0.17 %	
Ammonia + Ammonium Nitrogen	12.65 ppm	
Nitrate + Nitrite Nitrogen	1.25 ppm	
Phosphorus (P)	0.11 %	
Potassium (K)	0.03 %	
Arsenic (As)	0.1 ppm	CM1
Cadmium (Cd)	0.02 ppm	CM1
Cobalt (Co)	0.07 ppm	CM1
Chromium (Cr)	0.38 ppm	CM1
Copper (Cu)	35.5 ppm	CM2
Mercury (Hg)	0.01 ppm	CM1
Molybdenum (Mo)	0.18 ppm	CM2
Nickel (Ni)	0.58 ppm	CM1
Lead (Pb)	0.58 ppm	CM1
Selenium (Se)	0.13 ppm	CM2
Zinc (Zn)	17.5 ppm	CM2
E. coli	43989.379 CFU	CP2

Farm Unit Summary

Conc 11,Lot 2/3

This farm is a:
NASM Receiver

Status: Owned

Farm Location
County of Renfrew, Township of Killaloe, Hagarty and Richards
HAGARTY, Concession: 11, Lot: 2
HAGARTY, Concession: 11, Lot: 3

Roll Number(s) 473103101519200
473103101519300

Field Summary

Field 1

Area for Material: 1.52 ha
Planned Material Application Frequency: Every Year

(Fall 2013 - Fall 2014)	Agronomic (kg/ha) N	P2O5	K2O	Crop Removal (kg/ha) N	P2O5	K2O
Hay, mixed @ 6.4 tonne/ha Planted: May 1, 2014 Harvested: September 1, 2014	-60	-60	-400	-179	-41	-191
Material App 1 August 19, 2014 (actual) Killaloe @ 52.6 m³/ha Total Applied: 80 m³ Tanker, Not Incorporated Standing Crop	27	53	17	27	106	17
Nutrient Balance September 1, 2013 - August 31, 2014	-33 $	-7 $	-383 $	-152	65	-174

NASM Application Summary

Regulated Metals

1 addition(s) over regulated time period

Regulated Metal	Soil Test	This Application	Total Applied	5 Year Limit
Arsenic (As)	0.8 ppm	0.005 kg/ha	0.005 kg/ha	0%
Cadmium (Cd)	0.07 ppm	0.001 kg/ha	0.001 kg/ha	0%
Cobalt (Co)	2.67 ppm	0.004 kg/ha	0.004 kg/ha	0%
Chromium (Cr)	8.73 ppm	0.02 kg/ha	0.02 kg/ha	0%
Copper (Cu)	3.4 ppm	1.868 kg/ha	1.868 kg/ha	14%
Mercury (Hg)	< 0.05 ppm	0.001 kg/ha	0.001 kg/ha	1%
Molybdenum (Mo)	< 0.5 ppm	0.009 kg/ha	0.009 kg/ha	1%
Nickel (Ni)	3.67 ppm	0.031 kg/ha	0.031 kg/ha	1%
Lead (Pb)	4.7 ppm	0.031 kg/ha	0.031 kg/ha	0%
Selenium (Se)	< 1 ppm	0.007 kg/ha	0.007 kg/ha	3%
Zinc (Zn)	16.9 ppm	0.921 kg/ha	0.921 kg/ha	3%

Total Solids

This application: 1.6 tonne/ha
Total applied over regulated time period: 1.6 tonne/ha (7% of 5 year limit)

Phosphate

Cropping Year	P2O5 Crop Removal Balance
Fall 2013 - Fall 2014	65 kg/ha

Net P2O5 balance over regulated time period: 65 kg/ha (17% 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	No application is permitted
61 - 90 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 m^3/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

31.(a) Killaloe WASTEWATER TREATMENT PLANT
AEROBIC BIOSOLIDS ANALYSES

2014	Dry Matter (%)	TKN (%)	Ammonia & Ammonium (ppm)	Nitrate & Nitrites (ppm)	Phosphorus (%)	Potassium (%)	Arsenic (mg/L)	Cadmium (mg/L)	Cobalt (mg/L)	Chromium (mg/L)	Copper (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Lead (mg/L)	Selenium (mg/L)	Zinc (mg/L)	E Coli CFU/g Dry Wt
15-Jan	2.28	0.136	5.6	1.20	0.08	0.018	0.30	0.030	0.05	0.20	26	0.004	0.10	0.30	0.40	0.30	13	2807018
4-Feb	2.58	0.148	14.9	1.60	0.12	0.026	0.30	0.030	0.06	0.40	38	0.005	0.20	0.40	0.60	0.30	18	472868
19-Feb	2.83																	20495
4-Mar	2.39	0.18	1.6	1.80	0.11	0.025	0.10	0.019	0.07	0.36	36	0.006	0.14	0.47	0.50	0.10	16	736402
18-Mar	2.51																	4541833
1-Apr	2.34	0.155	6.8	1.00	0.08	0.018	0.10	0.008	0.05	0.26	25	0.004	0.11	0.33	0.40	0.10	12	2393162
15-Apr	2.31																	3636364
6-May	3.6	0.199	15.2	0.30	0.12	0.027	0.10	0.022	0.09	0.44	40	0.009	0.22	0.64	0.70	0.10	19	1666667
21-May	3.47																	1440922
3-Jun	3.03	0.196	12.4	2.00	0.11	0.026	0.10	0.018	0.07	0.34	33	0.004	0.18	0.53	0.50	0.10	17	1518152
17-Jun	2.9																	1931034
3-Jul	3.22	0.221	12.8	0.40	0.12	0.028	0.10	0.024	0.06	0.39	36	0.005	0.17	0.63	0.60	0.10	18	1801242
6-Aug	2.47	0.0812	10.2	2.30	0.10	0.023	0.10	0.020	0.04	0.33	33.00	0.006	0.16	0.51	0.50	0.20	16.00	619433
AVERAGE	**3.12**	**0.17**	**12.65**	**1.25**	**0.11**	**0.03**	**0.10**	**0.02**	**0.07**	**0.38**	**35.50**	**0.01**	**0.18**	**0.58**	**0.58**	**0.13**	**17.50**	**1409916.79**

Terratec Environmental
Sernoskie Home Farm - NASM Plan Site Map
Lots 2-3 Con 11 Township of Hagarty

Inspected by: Greg Hillier
Inspection Date: August 19, 2014
Projection: UTM Zone 18, NAD 83
GPS Coordinate: 310341E 5053827N

Features (see map for location)	
Tile Drained	NO
Rock Outcrops	NO
Soil Depth > 100cm	YES
Areas subject to Ponding	NO
Municipal Wells within 100m	NO

- Area Applied
- Test Hole: Soil depth >1m bgs
- Drilled Well
- 15m Setback to Drilled Well
- **Residence**
- 90m Setback to Residence
- **Temporary Channels for Surface Drainage**
- **Surface Water**
- **20m Setback to Surface Water**
- **150m to Surface Water (dashed white line)**
- **Slope Direction**
- **Field Access**
- Culvert
- GPS Location
- Lots & Cons

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 4%
6. The site is not tile drained. There are no tile inlets and outlets on the farm unit.

Imagery provided by Google Earth: Google earth V 7.1.2.2041. (7/6/2006). Hagarty Township, Ontario, Canada. 18T 310341E, 5053827N, Eye alt 6326 feet. DigitalGlobe 2014. http://www.earth.google.com (August 20, 2014]. Terratec Environmental has taken every effort to produce an accurate map but does not guarantee 100% accuracy. Questions should be directed to Terratec Environmental (905) 432-0954 or greg.hillier@amwater.com

NASM Plan Post Application Report

Michael Summers (NASM 1; Killaloe WWTP, WWTP Field)

Submission ID: 21694

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 (#12045)
Terratec Environmental
1612 Baseline Rd W.
Courtice, ON, Canada L1E 2S5
Phone #1: 905-242-1470
Email: greg.hillier@amwater.com

Agricultural Operation Information

Federal Business Number:

Operation Type: Sole Proprietorship

Operator Contact Information
Michael Summers
PO Box 295
393 Water Street
Killaloe, ON, Canada K0J 2A0
Phone #1: 613-625-2957

Owner is the same as the operator

Material Source Summary

NASM 1

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:1659 ppm (Wet Basis)

Wet Basis

Nutrient	Value	
Dry Matter (DM)	2.96 %	
Nitrogen (Total Kjeldhal Nitrogen)	0.158 %	
Ammonia + Ammonium Nitrogen	11.43 ppm	
Nitrate + Nitrite Nitrogen	1.53 ppm	
Phosphorus (P)	0.1 %	
Potassium (K)	0.024 %	
Arsenic (As)	0.1 ppm	CM1
Cadmium (Cd)	0.021 ppm	CM1
Cobalt (Co)	0.06 ppm	CM1
Chromium (Cr)	0.34 ppm	CM1
Copper (Cu)	32.5 ppm	CM2
Mercury (Hg)	0.006 ppm	CM1
Molybdenum (Mo)	0.16 ppm	CM2
Nickel (Ni)	0.53 ppm	CM1
Lead (Pb)	0.5 ppm	CM1
Selenium (Se)	0.13 ppm	CM2
Zinc (Zn)	16.25 ppm	CM2
E. coli	21491.463 CFU	CP2

Farm Unit Summary

Killaloe WWTP

Field at Killaloe WWTP

This farm is a:
NASM Receiver

Status: Owned

Farm Location
County of Renfrew, Township of Killaloe, Hagarty and Richards
HAGARTY, Concession: 6, Lot: 4

Roll Number(s) 473103404051000

Field Summary

WWTP Field

Area for Material: 9.5 ha
Planned Material Application Frequency: Every Year

(Fall 2013 - Fall 2014)	Agronomic (kg/ha) N	P2O5	K2O	Crop Removal (kg/ha) N	P2O5	K2O
Hay, mixed @ 6.4 tonne/ha Planted: May 1, 2014 Harvested: November 1, 2014	-60	0	-400	-179	-41	-191
Material App 1 September 24, 2014 (actual) NASM 1 @ 16.9 m³/ha Total Applied: 161 m³ Tanker, Not Incorporated Standing Crop	9	16	4	9	31	4
Nutrient Balance September 1, 2013 - October 31, 2014	-51 $	16	-396 $	-170	-10	-187

NASM Application Summary

Regulated Metals

1 addition(s) over regulated time period

Regulated Metal	Soil Test	This Application	Total Applied	5 Year Limit
Arsenic (As)	1.1 ppm	0.002 kg/ha	0.002 kg/ha	0%
Cadmium (Cd)	< 0.05 ppm	0 kg/ha	0 kg/ha	0%
Cobalt (Co)	2 ppm	0.001 kg/ha	0.001 kg/ha	0%
Chromium (Cr)	6.9 ppm	0.006 kg/ha	0.006 kg/ha	0%
Copper (Cu)	9.4 ppm	0.551 kg/ha	0.551 kg/ha	4%
Mercury (Hg)	< 0.05 ppm	0 kg/ha	0 kg/ha	0%
Molybdenum (Mo)	< 0.5 ppm	0.003 kg/ha	0.003 kg/ha	0%
Nickel (Ni)	4 ppm	0.009 kg/ha	0.009 kg/ha	0%
Lead (Pb)	4.2 ppm	0.008 kg/ha	0.008 kg/ha	0%
Selenium (Se)	< 1 ppm	0.002 kg/ha	0.002 kg/ha	1%
Zinc (Zn)	19 ppm	0.275 kg/ha	0.275 kg/ha	1%

Total Solids

This application: 0.5 tonne/ha
Total applied over regulated time period: 0.5 tonne/ha (2% of 5 year limit)

Phosphate

Cropping Year	P2O5 Crop Removal Balance
Fall 2013 - Fall 2014	-10 kg/ha

Net P2O5 balance over regulated time period: -10 kg/ha (0% 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

Flag Summary

Minimum Application Rate (Killaloe WWTP, WWTP Field, Material App 1)

The application rate is less than the recommended minimum (22.5 m³/ha).

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

31.(a) Killaloe WASTEWATER TREATMENT PLANT
AEROBIC BIOSOLIDS ANALYSES

2014	Dry Matter (%)	TKN (%)	Ammonia & Ammonium (ppm)	Nitrate & Nitrites (ppm)	Phosphorus (%)	Potassium (%)	Arsenic (mg/L)	Cadmium (mg/L)	Cobalt (mg/L)	Chromium (mg/L)	Copper (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Lead (mg/L)	Selenium (mg/L)	Zinc (mg/L)	E Coli CFU/g Dry Wt
15-Jan	2.28	0.136	5.6	1.20	0.08	0.018	0.30	0.030	0.05	0.20	26	0.004	0.10	0.30	0.40	0.30	13	2807018
4-Feb	2.58	0.148	14.9	1.60	0.12	0.026	0.30	0.030	0.06	0.40	38	0.005	0.20	0.40	0.60	0.30	18	472868
19-Feb	2.83																	20495
4-Mar	2.39	0.18	1.6	1.80	0.11	0.025	0.10	0.019	0.07	0.36	36	0.006	0.14	0.47	0.50	0.10	16	736402
18-Mar	2.51																	4541833
1-Apr	2.34	0.155	6.8	1.00	0.08	0.018	0.10	0.008	0.05	0.26	25	0.004	0.11	0.33	0.40	0.10	12	2393162
15-Apr	2.31																	3636364
6-May	3.6	0.199	15.2	0.30	0.12	0.027	0.10	0.022	0.09	0.44	40	0.009	0.22	0.64	0.70	0.10	19	1666667
21-May	3.47																	1440922
3-Jun	3.03	0.196	12.4	2.00	0.11	0.026	0.10	0.018	0.07	0.34	33	0.004	0.18	0.53	0.50	0.10	17	1518152
17-Jun	2.9																	1931034
3-Jul	3.22	0.221	12.8	0.40	0.12	0.028	0.10	0.024	0.06	0.39	36	0.005	0.17	0.63	0.60	0.10	18	1801242
22-Jul	2.82																	450355
6-Aug	2.47	0.0812	10.2	2.30	0.10	0.023	0.10	0.020	0.04	0.33	33.00	0.006	0.16	0.51	0.50	0.20	16.00	619433
20-Aug	3.96																	156566
3-Sep	2.32	0.133	10.3	1.40	0.08	0.018	0.10	0.020	0.07	0.29	28.00	0.008	0.13	0.43	0.40	0.10	14.00	461207
AVERAGE	**2.96**	**0.158**	**11.43**	**1.53**	**0.10**	**0.024**	**0.10**	**0.021**	**0.06**	**0.34**	**32.50**	**0.006**	**0.16**	**0.53**	**0.50**	**0.13**	**16.25**	**726062.95**

AgTest Farm Soil Report

SGS AGRIFOOD LABORATORIES
1-503 Imperial Road North Guelph, ON, N1H 6T9 t: 519-837-1600 1-800-265-7175 f: 519-837-1242 ca.agri.guelph.lab@sgs.com

Report # 497848 SGS LAKEFIELD - Carrie Greenlaw - SEP13223

Sample ID:	Lab #	pH	BpH	Total Salts (mmhos/cm)	Organic Matter (%)	Nitrogen NO3-N (ppm)	Phosphorus - P (ppm)		Potassium K (ppm)	Magnesium Mg (ppm)	Calcium Ca (ppm)
SEP13223 - Kilaloe Plant Field Sample	30357620	6.2	6.5								

Sample ID:	Zinc Zn (ppm)	Zn Index	Manganese Mn (ppm)	Mn Index	Copper Cu (ppm)	Iron Fe (ppm)	Boron B (ppm)	Texture	Cation Exchange MEQ/100g	Base Saturation K%	Mg%	Ca%	H%
SEP13223													

Sample ID:	Sodium Na (ppm)	Sulphate Sulphur SO4-S (ppm)	Chloride Cl (ppm)	Aluminum Al (ppm)	K/Mg Ratio	Exchangeable Acidity						
SEP13223												

This Report shall not be reproduced without the written consent of SGS.Agri-Food Laboratories.
These results pertain solely to the sample(s) received by the laboratory.

Authorized By: *Jack Legg - Certified Crop Advisor, CCA-ON*

SGS LAKEFIELD - Carrie Greenlaw - SEP13223
185 Concession St.
Lakefield, ON K0L 2H0

Email

Date Received: Sep-16-2014
Date Reported: Sep-19-2014

Fax: 705-652-6365
Email: carrie.greenlaw@sgs.com

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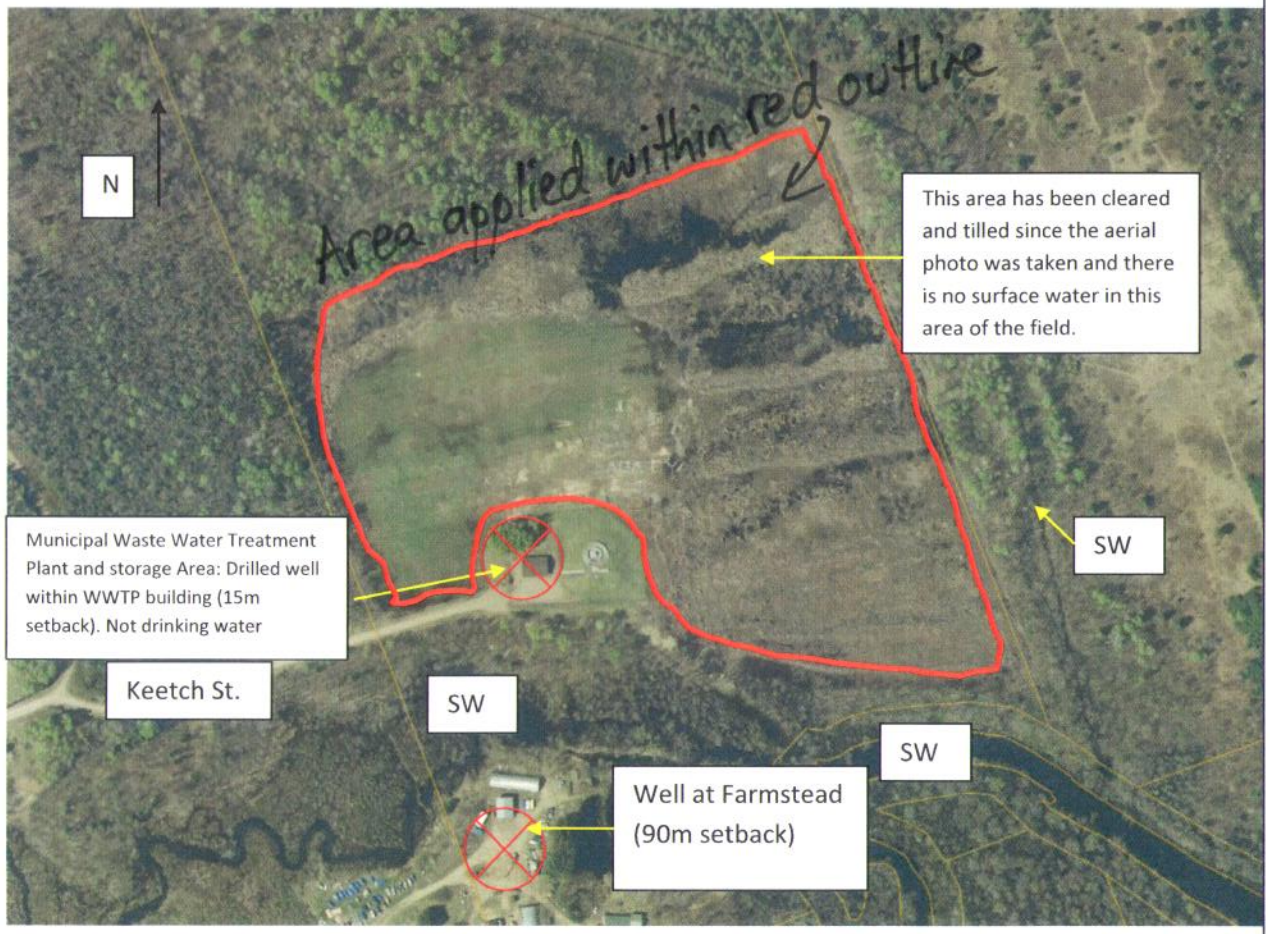
Michael Summers Farm



Site Inspection was completed on October 21, 2013 by Michael Payne, Black Lake Environmental

The field is not tile drained

There are no tile inlets in or adjacent to the field

There are no rock outcrops or shallow soils (<1m)

There are no areas subject to ponding or flooding other than those indicated.

There is no surface water other than that indicated within 150m of the NASM Application Area. A 20m setback will be maintained from all surface water.

There are no wells other than those indicated within 100m of the NASM Application Area. A 90m setback will be maintained from all wells unless otherwise indicated.

There are no residences or other occupied buildings other than those indicated within 100m of the NASM Application Area. Other than those indicated there are no other areas of commercial, community or institutional use within the regulated distances of the NASM Application Area.

There are no temporary field storage sites

The field sketch is not to scale

SW = Surface Water

Appendix C

Biosolids Quality Report

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: ANAEROBIC
Solids and Nutrients

Facility: KILLALOE WASTEWATER TREATMENT FACILITY
Works: 5539
Period: 01/01/2014 to 12/01/2014

Facility Works Number: *110001532*
Facility Name: *KILLALOE WASTEWATER TREATMENT FACILITY*
Facility Owner: *Municipality: Township of Killaloe, Hagarty & Richards*
Facility Classification: *Class 2 Wastewater Treatment*
Receiver: *Brennan Creek*
Service Population:
Total Design Capacity:
Period Being Reported: 01/01/2014 01/12/2014

Note: all parameters in this report will be derived from the Bslq Station

Month	Total Sludge Hauled (m3)	Avg. Total Solids (mg/L)	Avg. Volatile Solids (mg/L)	Avg. Total Phosphorus (mg/L)	Ammonia (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	TKN (mg/L)	Ammonia + Nitrate (mg/L)	Potassium (mg/L)
Site	**KILLALOE WASTEWATER TREATMENT FACILITY**									
Station	**Bslq Station only**									
Parameter Short Name	**HauledVol**	**TS**	**VS**	**TP**	**NH3p_NH4p_N**	**NO3-N**	**NO2-N**	**TKN**	**calculation in report - no T/S**	**K**
T/s	**IH Month.Total**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**		**Lab Published Month Mean**
Jan		22,800.000	17,000.000	810.000	5.600	0.800	0.400	1,360.000	3.200	180.000
Feb		27,050.000	19,100.000	1,200.000	14.900	0.800	0.800	1,480.000	7.850	260.000
Mar		24,500.000	17,700.000	1,100.000	1.600	1.000	0.800	1,800.000	1.300	250.000
Apr		23,250.000	17,800.000	790.000	6.800	0.600	0.400	1,550.000	3.700	180.000
May		35,350.000	27,700.000	1,200.000	15.200	0.300	0.200	1,990.000	7.750	270.000
Jun		29,650.000	23,300.000	1,100.000	12.400	0.600	1.400	1,960.000	6.500	260.000
Jul		30,200.000	24,400.000	1,200.000	12.800	0.300	0.400	2,210.000	6.550	280.000
Aug	80.000	32,150.000	18,500.000	1,000.000	10.200	1.000	1.300	812.000	5.600	230.000
Sep	161.000	26,200.000	17,300.000	870.000	10.300	0.900	0.500	1,330.000	5.600	180.000
Oct		19,000.000	13,700.000	710.000	7.200	0.800	0.300	1,040.000	4.000	140.000
Nov		18,700.000	14,300.000	610.000	11.700	0.300	0.300	1,550.000	6.000	140.000
Dec		19,150.000	14,000.000	650.000	5.000	0.400	0.900	1,350.000	2.700	130.000
Average	120.500	25,666.667	18,733.333	936.667	9.475	0.650	0.642	1,536.000	5.063	208.333
Total	241.000	308,000.000	224,800.000	11,240.000	113.700	7.800	7.700	18,432.000	60.750	2,500.000

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: AEROBIC
Metals and Criteria

Facility: KILLALOE WASTEWATER TREATMENT FACILITY
Works: 5539
Period: 01/01/2014 to 12/01/2014

Note: all parameters in this report will be derived from the Bslq Station

Month	Arsenic (mg/L)	Cadmium (mg/L)	Cobalt (mg/L)	Chromium (mg/L)	Copper (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Lead (mg/L)	Selenium (mg/L)	Zinc (mg/L)
Site	**KILLALOE WASTEWATER TREATMENT FACILITY**										
Station	**Bslq Station only**										
Parameter Short Name	**As**	**Cd**	**Co**	**Cr**	**Cu**	**Hg**	**Mo**	**Ni**	**Pb**	**Se**	**Zn**
T/s	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**
Jan	0.300	0.030	0.050	0.200	26.000	0.004	0.100	0.300	0.400	0.300	13.000
Feb	0.300	0.030	0.060	0.400	38.000	0.005	0.200	0.400	0.600	0.300	18.000
Mar	0.100	0.019	0.070	0.360	36.000	0.006	0.140	0.470	0.500	0.100	16.000
Apr	0.100	0.008	0.050	0.260	25.000	0.004	0.110	0.330	0.400	0.100	12.000
May	0.100	0.022	0.090	0.440	40.000	0.009	0.220	0.640	0.700	0.100	19.000
Jun	0.100	0.018	0.070	0.340	33.000	0.004	0.180	0.530	0.500	0.100	17.000
Jul	0.100	0.024	0.060	0.390	36.000	0.005	0.170	0.630	0.600	0.100	18.000
Aug	0.100	0.020	0.040	0.330	33.000	0.006	0.160	0.510	0.500	0.200	16.000
Sep	0.100	0.020	0.070	0.290	28.000	0.008	0.130	0.430	0.400	0.100	14.000
Oct	0.100	0.014	0.050	0.260	25.000	0.003	0.110	0.350	0.400	0.100	12.000
Nov	0.100	0.012	0.040	0.210	21.000	0.003	0.100	0.310	0.400	0.100	10.000
Dec	0.100	0.010	0.040	0.220	22.000	0.009	0.100	0.310	0.400	0.100	12.000
Average	0.133	0.019	0.058	0.308	30.250	0.006	0.143	0.434	0.483	0.142	14.750
Max. Permissible Metal Concentrations (mg/kg of	170.000	34.000	340.000	2,800.000	1,700.000	11.000	94.000	420.000	1,100.000	34.000	4,200.000
Metal Concentrations in Sludge (mg/kg)	5.195	0.737	2.240	12.013	1,178.571	0.214	5.584	16.916	18.831	5.519	574.675