

RICHARDS LANDING
WATER POLLUTION CONTROL PLANT

2014

ANNUAL OPERATING REPORT

January 1, 2014 to December 31, 2014

March 27, 2015

Richards Landing Sewage Treatment Plant
P.O. Box 187
Richards Landing ON P0R 1J0

Certificate of Approval
3-0545-93-006

2014 ANNUAL REPORT

The enclosed 2014 report for the above referenced facility summarizes the performance and related activities in accordance with C of A #3-0545-93-006, section 17a to 17j as follows:

- 17.a A summary of all monitory and compliance reports submitted in the reporting period, including an overview of the success and adequacy of the sewage treatment program;

	<u>Average (mg/l)</u>
Effluent Parameter - BOD5 15	5.33
Suspended Solid - 15	8.2
Total Phosphorus - 1	0.49

Based on the above information the plant far surpassed all objectives that the plant was designed and required to perform.

- 17.b A comprehensive interpretation of all monitoring data and analytical data collected relative to the works during the reporting period and a comparison to the effluent quality and quantity criteria described in sections 11 and 12;

Effluent quality at all times surpassed the objectives set out in the C of A based on the information from 17a. Flows through the sewage treatment plant did not exceed the specified average daily flow of 422.5m³/d in any month in 2014. The average daily flow being 125m³ in 2014 which is 30% of the design flow. The maximum daily flow of 211m³ was recorded May 2014 and was 14% of Maximum daily flow designed of 1537.9m³/d.

- 17.c A summary of any effluent quality assurance or control measures undertaken during the reporting period;

Raw and treated parameters set out by the C of A are analyzed at SGS Lakefield Research an accredited laboratory located in Lakefield Ontario. In house testing is done by a Licensed Operator.

The information generated from this program is used to monitor the treatment efficiency of the treatment process and to assist with changes to improve the quality of the effluent from the plant.

- 17.d A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works;

All maintenance is scheduled using information supplied by the equipment manufacturer and taken from the O & M Manuals. No major repairs were undertaken in 2014, other than routine maintenance.

- 17.e A description of any operating problems encountered and corrective actions taken during the reporting period;

There were no operating or environmental problems encountered in 2014.

- 17.f A summary of any proposed alteration, extension or replacement in the process or operation of the works to be completed over the next reporting period which may require approval under the Ontario Water Resources Act;

There are no planned alterations for the year 2015.

- 17.g A tabulation of the volume of sludge generated in the reporting period and an outline of anticipated volumes to be generated over the next reporting period;

30,500 gallons of sludge were removed from the plant in 2014. We anticipate generating approximately 40,000 gallons in 2015.

- 17.h An outline of the sludge handling methods and disposal areas to be utilized over the next reporting period;

Sludge was hauled by Edwin Karhi, a Licensed Septic Hauler and disposed of at drying beds at the Township Landfill Site C of A No. A561701.

- 17.i An evaluation of the calibration and maintenance procedures conducted on all monitoring equipment;

Meters were calibrated by PUC Services Inc. on January 21, 2014.

Information provided from records by
B. Elliott Superintendent of Water & Sewer Services



Carol O. Trainor, AMCT
Clerk Administrator
March 27, 2015

2014 APPENDICES

- A Brief Description of the Plant
- B Copy of STP Certificate
- C Copy of the Operators Certificate
- D Flow and Concentration Summary
- E Sault Public Utilities Commission (PUC) Inc. Meter Calibration
- F Process Flow Diagram

2014

ANNUAL OPERATIONS REPORT

RICHARDS LANDING SEWAGE TREATMENT PLANT

APPENDIX

A

BRIEF DESCRIPTION OF PLANT

Secondary Treatment

Comprising of three 3.6m (12 ft.) diameter by 6.1m (20 ft.) long Rotating Biological Contactor Units with a total of 22,850m² (245,800 ft²) bio support media divided into four separate stages and equipped with one air blower and supplementary air diffusion system for the first two stages and having a capacity of 255 m³/h (150 cfm) against 23.5 kPa (3.5 psi).

Secondary Clarification

Three secondary clarifiers, each approximately 3.5m x 3.5m (11.5 ft. x 11.5 ft.) dimensions and each equipped with one air-lift sludge return pump and one air lift surface skimmer.

Phosphorous Removal

Chemical phosphorus removal system comprising one aluminium sulphate (alum) storage tank, day tank, transfer pump and three positive displacement diaphragm metering pumps feeding alum to the head of the clarifiers.

Disinfection

Sodium Hypochlorite (chlorine) disinfection system comprising of one day tank and a metering pump feeding chlorine into the chlorine contact chamber having a detention time of 30 minutes.

Control Building

A 135m² control building situated on top of the equalization tanks and housing the chemical storage and feeding facilities, air blowers, standby power, electrical and control panels. The overall plant has been designed to run manually with automatic controls for pump, air lift pumps and scum skimmer. Levels are monitored automatically and the plant effluent flow charted electronically. The plant effluent flow in turn controls the level of alum dosage to the clarifiers. All major components of the plant are monitored and alarms are activated via a telephone line to the relevant personnel in case of emergencies. Overall the plant is very functional in terms of the original design criteria of simplicity in design and maintenance with low operational costs.

SEWAGE WORKS

The Sewage Treatment Plant situated at the west side of the community at the end of Shore Street, forms part of the sewage collection and treatment system comprising of the underground sewer collection system and Sewage Pumping Station located on Highway 548 and Russell Street. The sewage flows by gravity to the Sewage Pumping Station from where it is pumped to the Sewage Treatment Plant. The Sewage Pumping Station is designed for a 20 year peak flow of 17.8 L/s (282 USgpm) at a total discharge head of 46.0m (151 ft.) and is supplied with emergency power from the generator located at the Water Plant.

The Sewage Treatment Plant has been designed primarily to treat domestic sewage for the 20 year average day flow of 4.9 L/s (78 USgpm) and a peak flow of 17.8 L/s (282 USgpm). The Ministry of the Environment has approved treatment to secondary level (15 mg/L BOD₅, 15 mg/L SS & 1 mg/L Phosphorous) for discharge of effluent to St. Mary's River. The disinfected effluent is discharged by gravity via a sewage outfall line to a diffuser located 450m offshore and designed to provide adequate dispersion and dilution of the effluent to ensure the effluent is directed away from the shore, to protect downstream domestic and recreational users. The plant is equipped with a 75 KW generator for emergency power. A brief description of the sewage treatment plant follows.

Primary Clarification

The Sewage Treatment Plant comprises of a sewage flow splitter box with a manually raked bar screen. Adjacent to the splitter box is a composite sampler which collects composite samples of raw sewage for testing purposes. The flow is directed into two primary clarification and sludge storage septic tanks with a total volume of approximately 450m³ (119,000 USgal) which includes approximately six months storage volume for primary and secondary sludge. These tanks overflow through two weirs into the equalization tanks.

Flow Equalization

Flow is directed into the two aerated equalization tanks, with a total flow equalization capacity of approximately 230m³ (60,750 USgal) equipped with three submersible pumps (two duty and one standby) each having a rated capacity of 6.7 L/s (106 USgpm) at 3.3m (10.8 ft.) T.D.H., and coarse bubble air-diffusion system equipped with air blower having a capacity of 230 m³/h (135 cfm) against 38 kPa (5.5 psi).

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COPY OF STP CERTIFICATE



CERTIFICATE OF CLASSIFICATION / CERTIFICAT DE CATÉGORIE

TOWNSHIP OF ST. JOSEPH
COMMUNITY OF RICHARDS LANDING
SEWAGE TREATMENT PLANT
WASTEWATER TREATMENT

CLASS 2

Date issued / Délivré le **MARCH 21, 1995**

Certificate No. / Certificat n° **2366**



Director
Directeur(trice)



Minister of Environment and Energy
Ministre de l'Environnement et de l'Énergie



Ontario
1374E (07/93)

2014

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C

COPY OF OPERATORS CERTIFICATE



Ontario

**WASTEWATER OPERATOR LICENCE /
PERMIS D'EXPLOITANT DE RESEAU D'EGOUT**

BARRY W. ELLIOTT

has met the requirements under Ontario Regulation 129/04 made under the Ontario Water Resources Act, 1990 for the Wastewater Operator Licensing Program. / a satisfait aux exigences en vertu du Reglement de l'Ontario 129/04 pris en application de la Loi de 1990 sur les ressources en eau de l'Ontario du Programme de delivrance des permis d'exploitant de reseau d'egout.

**WASTEWATER TREATMENT FACILITY
INSTALLATION DE TRAITEMENT DES EAUX USEES**

CLASS/CATEGORIE 2

April 30, 2017

9505

D. Salamon

2014
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APPENDIX

D

FLOW AND CONCENTRATION SUMMARY



THE CORPORATION OF THE TOWNSHIP OF ST. JOSEPH

P.O. Box 187
 1669 Arthur Street
 Richards Landing, ON P0R 1J0
 Telephone: 705-246-2625
 Fax: 705-246-3142
 www.stjosephtownship.com

SEWAGE PLANT PERFORMANCE ASSESSMENT REPORT

Municipality: Township of St. Joseph Year: 2014
 Project: WPCP Water Course: North Channel
 Project #: 110002871 Design
 Capacity: 422.5 x m3/d
 Max. Design
 Capacity: 15379 x m3/d
 Description: Rotating Biological Contractor

Month	Flows			Biochemical O2 Demand				Suspended Solids			
	TOTAL FLOW M3	AVG DAY FLOW M3	MAX DAY FLOW M3	AVG RAW BOD (mg/L)	AVG EFF BOD (mg/L)	LOADING KG/D	PERCENT REMOVAL	AVG RAW SS (mg/L)	AVG EFF SS (mg/L)	LOADING K/D	PERCENT REMOVAL
January	2539	82	91	64	4	0.3276	94%	70	10	0.819032	86%
February	2279	81	85	125	4	0.3255	97%	153	11	0.895321	93%
March	3304	107	164	290	4	0.4263	99%	208	11	1.172387	95%
April	5213	174	197	94	4	0.695	96%	100	5	0.868833	95%
May	4994	161	211	179	4	0.6443	98%	115	11	1.772065	90%
June	4134	138	150	38	4	0.5512	89%	34	10	1.378	71%
July	4224	136	152	150	4	0.545	97%	63	7	0.953807	89%
August	3971	128	154	132	4	0.5123	97%	68	6	0.768581	91%
September	2998	100	127	120	12	1.1992	90%	72	6	0.5996	92%
October	4631	149	209	31	4	0.5975	87%	48	5	0.746936	90%
November	3475	116	165	25	12	1.39	52%	28	9	1.0425	68%
December	3666	118	146	260	4	0.473	98%	312	7	0.827807	98%

TOTAL	45428	1490	1851	1508	64	7.6869		1271	98	11.84487	
AVG	3785.6667	124.1667	154.25	125.666667	5.333333333	0.640575		105.9167	8.166667	0.987072	
MAX	5213	174	211	290	12	1.39		312	11	1.772065	

Month	Phosphorus				DISINF	ALU		NITROGEN				pH
	AVG RAW PHOS (mg/L)	AVG EFF PHOS(mg /L)	LOADING KG/D	PERCENT REMOVAL	AVG CL2 RES (mg/L)	AVG DOSE (mg/L)	LITRES USED (L)	TKN MG/LAS N (mg/L)	AMMONI UM MG/LAS N (mg/L)	NO2 MG/LAS N (mg/L)	N03 MG/LAS N (mg/L)	
January	2.41	0.64	0.64	73%	0.63	197	772	1.1	0.1	0.03	19.9	7.51
February	1.1	0.9	0.9	18%	0.55	208	730.4	0.8	0.1	0.03	19.8	7.1
March	9.3	0.46	0.46	95%	0.46	208	881	50.7	0.1	0.03	14.3	6.93
April	4.42	0.2	0.2	95%	0.36	142	1137	0.5	0.1	0.3	12.4	6.96
May	3.35	0.41	0.41	88%	0.66	118	911	0.5	0.1	0.03	12.3	7.99
June	2	0.49	0.49	76%	0.55	157	998	1.6	0.1	0.03	23	6.96
July	4.7	0.4	0.4	91%	0.55	141	922	1	0.1	0.03	32.5	6.85
August	7.2	0.82	0.82	89%	0.5	112	683	2	0.1	0.03	24.8	7.07
September	3.04	0.42	0.42	86%	0.55	178	824	0.5	0.1	0.03	24.1	7.33
October	1.49	0.13	0.13	91%	0.46	143	1025	0.5	0.1	0.03	20.3	7.24
November	1.29	0.42	0.42	67%	0.5	159	853	1.1	0.1	0.03	18.1	7.01
December	5.56	0.53	0.53	90%	0.58	158	892	0.5	0.1	0.03	20.8	6.98

TOTAL	45.86	5.82	5.82		6.35	1921	10628.4	60.8	1.2	0.63	242.3	85.93
AVG	3.8216667	0.485	0.485		0.529166667	160.0833	885.7	5.066667	0.1	0.0525	20.191667	7.160833
MAX	9.3	0.9	0.9		0.66	208	1137	50.7	0.1	0.3	32.5	7.99

COMPLETED & APPROVED BY:

Barry Elliott - Water & Sewer Superintendent

2014

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RICHARDS LANDING SEWAGE TREATMENT PLANT

APPENDIX

E

PUC INC. METER CALIBRATION



INSTRUMENT VERIFICATION CERTIFICATE

Cal Date: Jan 21/14
Due Date: Jan 21/15
Frequency: 1/yr

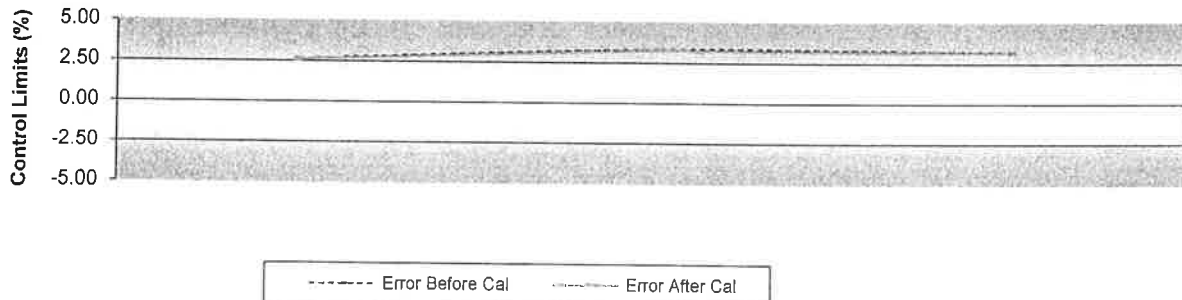
<i>Instrument ID:</i>	Richard's Landing Waste Water Flow	<i>Type:</i>	Multiranger Plus (OCM)/60 Deg. V-notch
<i>Instrument Number:</i>	FIT-300	<i>S/N:</i>	N/A
<i>Instrument Range:</i>	0 - 16 L/s	<i>Output:</i>	4 - 20mA
<i>Accuracy (%+/-):</i>	+/- 15.00%	<i>Note:</i>	

<i>Calibration Standard:</i>	Stainless ruler and flowrate calculation for 60 degree V-Notch weir	<i>Recertification Date:</i>	N/A
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Calibration/Verification Data

OCM Depth m	Reference flow L/s	Flow as found L/s	% error before	As found Pass/Fail	Flow as left L/s	% error after
0.080	1.442	1.480	2.62	PASS	1.480	2.62
0.090	1.936	2.000	3.31	PASS	2.000	3.31
0.100	2.519	2.600	3.20	PASS	2.600	3.20

CALIBRATION PLOT



Remarks: Distance was measured using tape measure then compared to milltronics input.

Flow formula used ($Q=796.7 H^{2.5}$)

Depth of water = span - measured distance from top of water to transducer face.

Weir dimensional data should be documented here.

Conformity



Instrument calibration is within acceptable tolerance



Instrument calibration not within acceptable tolerance

Calform Richard's Landing Waste Flow 2014

Instrumentation Technician:

Gary Robertson

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PROCESS FLOW DIAGRAM

Sheet No.	25
Project No.	
Scale	
Author	
Check	
Date	
Drawn by	
Checked by	
Approved by	
Date	

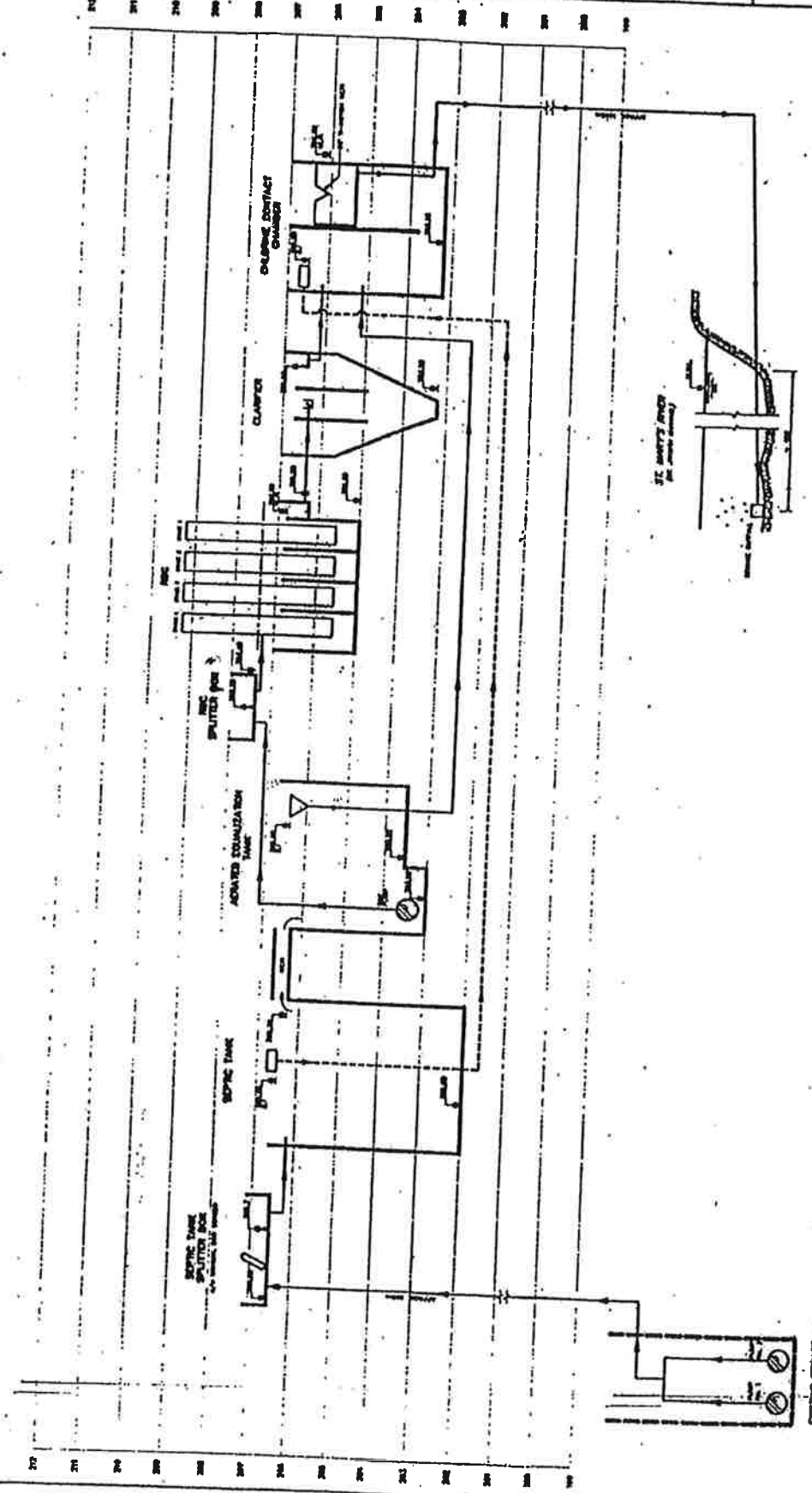
Ministry of
 Environment and Energy
 The Township of
 St. Joseph
 Community of
 Richards Landing
 Sewage Works Programme
 S.W.S.P. Project No. 2004
 Contract No. 2004
 Sewage Treatment Plant

**MECHANICAL
SCHEMATICS**

HYDRAULIC GRADIENT

1994 10/20/94 25

 Corporation of St. Joseph
 1775 Highway 108, Richards Landing, Ontario, Canada
 Telephone: (705) 471-1234
 Fax: (705) 471-1235
 E-mail: info@stjoseph.ca



EXISTING SEWAGE PUMPING STATION

OXIDATION DITCH