

March 7th, 2016

Ministry of the Environment
70 Foster Drive, Suite 110
Sault Ste. Marie, ON P6A 6V4



ATTENTION: Safe Drinking Water Branch

RE: ELLIOT LAKE Wastewater Treatment Plant Annual Performance Report - 2015

Please find attached, the 2015 Annual Report for the Elliot Lake Wastewater Treatment Plant. This report has been prepared in accordance to the guidelines set out in Condition 10₍₅₎ of Facility Certificate of Approval Number 5239-5GXSMK.

This report covers the period from January 1, 2015 to December 31, 2015.

Please direct any questions or concerns to the undersigned.

Yours truly,

A handwritten signature in black ink, appearing to read "Sean McGhee".

Sean McGhee
Director of Operations
City of Elliot Lake

Elliot Lake Wastewater Treatment Plant

2015 Annual Report

The purpose of this report is to provide performance and compliance records pertaining to the Elliot Lake wastewater treatment plant to the Ministry of the Environment. This report is prepared in accordance with Condition 10₍₅₎ of the Certificate of Approval and covers the reporting period from January 1, 2015 to December 31, 2015.

This report contains the following information:

- a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the *Works*;
- b) a description of any operating problems encountered and corrective actions taken;
- c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the *Works*;
- d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;
- e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment;
- f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6;
- g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;
- h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;
- i) a summary of all *By-pass*, spill or abnormal discharge events;

a) - Effluent Limits – Condition 7:

Month	CBOD	Total Suspended Solids	Total Phosphorus	Total Flow	CBOD Loading	Total Suspended Solids Loading	Total Phosphorus Loading
	Monthly Average mg/l	Monthly Average mg/l	Monthly Average mg/l	Cubic Meters / month	Kilograms / day	Kilograms / day	Kilograms / day
January	8	15	0.40	123,543	31.9	59.8	1.6
February	6	17	0.44	107,632	23.1	65.3	1.7
March	3	19	0.41	145,678	14.1	89.2	1.9
April	9	19	0.44	221,543	66.4	140.3	3.2
May	9	15	0.33	160,259	46.5	77.5	1.6
June	3	15	0.32	185,364	18.5	92.7	2.0
July	<2	14	0.36	122,845	7.9	55.5	1.4
August	4	9	0.29	118,087	15.2	34.2	1.1
September	4	24	0.72	151,949	20.3	121.6	3.6
October	4	16	0.74	146,004	18.8	75.3	3.5
November	9	24	0.83	238,742	71.6	190.9	6.6
December	<2	13	0.55	294,447	18.9	123.4	5.2
Annual Average	5.9	17	0.49	168,007	29.4	93.8	2.8

The total flow for the facility for the 2015 operating year was 2,016,093 cubic meters

b) – Operating Problems or Issues Encountered:

Numerous obstructions in the digested sludge recirculation system were encountered in the first quarter of 2015. These obstructions were attributed to large accumulations of fibrous material within the primary digester. This resulted in poor mixing and heat distribution and significant reductions in methane production. These issues were remediated through a complete digester cleanout utilizing outside forces. All material was removed from the digester; the entire structure including the sludge recirculation piping was inspected and repaired or replaced as warranted.

Following the cleanout of the primary digester the processes was restored through careful monitoring of pH, solids levels, temperature and mixing. Full operation, including methane production was restored by summer of 2015.

The secondary aeration chamber, which has been out of service for approximately one decade, was returned to service in the summer of 2015. Process adjustments were monitored by operational staff to determine optimal process setpoints.

c) – Summary of Facility Maintenance:

Annual maintenance for the facility is scheduled in excel format and is followed up with a work order which is submitted to the department head for review and file.

In addition to scheduled preventative maintenance programs, capital works projects including the clean out of the Primary digester and the replacement of the Heat Exchanger were undertaken. The digester work was completed utilizing the services of Terratec Environmental and took approximately one month, at a total cost of \$81,153.⁰⁰.

The heat exchanger was replaced with an identical unit and installed by Spec & Sons Mechanical Contractors at a capital budget of \$48,733.⁰⁰.

The repair and commissioning of the dormant aeration cell # 2, which included the rebuild of 2 of the 4 aeration motors at a cost of \$3,100.⁰⁰ was completed in August.

The effluent flow meter was replaced at cost of \$3,560.⁰⁰.

d) – Quality Assurance, Quality Control Measures:

The majority of the process analysis for the facility is done in house by the Operation staff using standardized and accepted laboratory techniques. All results are recorded and compared to historical data. In the event that a deviation is detected, repeat analysis is performed to verify the results. Samples such as BOD₅ and CBOD are sent to an accredited lab for analysis. Plant process is further monitored through the use of an on-line turbidity analyser which is monitored daily.

e) – Calibration and Maintenance of Effluent Monitoring Equipment:

The effluent turbidity analyzer and the analytical equipment used in the lab are tested and verified monthly by the plants department operational personnel. The analytical equipment in the laboratory is calibrated once annually. Calibration reports are attached.

f) – Effluent Objectives:

As identified in Section a) of this report, the Effluent Objectives for Suspended Solids, CBOD and for Total Phosphorus are being met by the facility.

Plant chlorination values are sent to the Medical Officer of Health with copies sent to various other stakeholders on a monthly basis. The four sample locations reported for the dechlorination project are as follows:

- Location One – Esten Lake at a point near the diversion channel;
- Location Seven – Diversion Channel taken at the point where Nordic Creek is introduced to the wastewater effluent stream;
- Location Three – Depot Lake farthest area of lake after diversion channel stream is introduced;
- Final Effluent – last accessible sample point in plant. Note that residuals at this location vary as a result of partial mixing and contact time this is due to location of chlorine injection in relation to the sample port;

Changes in the sampling procedure for Final Effluent bacteriological sample collection were developed and implemented in 2014. Total volume of the effluent line was calculated based on as built drawings to determine actual, minimum and maximum chlorine contact time for the treated and chlorinated effluent. Once representative hold times were established prior to the introduction of sodium thiosulphate in the bacteriological sampling process, the coliform counts were seen to be significantly reduced and verified that the plant is meeting effluent criteria as can be seen in the table below;

AVERAGE FLOW FOR 2015 WAS 5524 m3/Day or 3836 L/min

THE EFFLUENT PIPE IS .8M IN DIAMETER AND IS 2400 m LONG

VOLUME OF PIPE $A = \pi r^2 \times \text{length}$ $A = 3.14(.4m)^2 \times 2400 m = 1205 m^3$ or 1205 000 L

TIME IN PIPE WITH AVERAGE FLOW $\frac{1205\ 000L}{3836\ L/min} = 314$ Minutes or 5.2 hours.

Based on an average flow of 3,836 l/min, the calculated retention and contact time is 5.2 hours. All samples are held for five (5) hours prior to total chlorine residual analysis, bottling, and shipment to the lab.

Month	Geometric Mean - Total Coliform	Geometric Mean - E-Coli
May	2.7	0
June	55	2.0
July	62.9	0
August	177.2	14.5
September	24.2	1.0
October	31.1	2.7

g) – Sludge

All waste sludge is hauled under contract from the wastewater treatment facility to Waste Disposal Site # A560812. The current sludge haulage contractor is KJ. Beamish Ltd. based out of Elliot Lake, Ontario.

The City of Elliot Lake retained the services of Pinchin Ltd to meet the compliance requirements identified in Conditions 22 and 24 of Environmental Compliance Approval No. A560812.

Month	Digested Sludge Hauled	Methane Produced	Methane Wasted	Aluminum Sulphate Used
	Cubic Meters	Cubic Meters	Cubic Meters	Tonnes
January	464	7003	163	8.3
February	296	8223	0	7.1
March	420	3992	0	8.6
April	277	756	14.1	8.2
May	153	1510	342	6.7
June	972	0	0	7.1
July	66	0	0	6.2
August	420	1325	2363	6.3
September	420	6194	1623	6.4
October	363	6924	60	6.2
November	315	6369	0	8.3
December	219	4962	0	11.6
	4,385	47,258	4,565	91

h) - Complaints:

There were no noted complaints with regard to the operation of the wastewater treatment facility in this reporting year.

i) – Bypasses, Spills, or Abnormal Discharge Events:

One high flow report was reported in 2015. The system experienced flows exceeding the Certificate of Approval as a result of a heavy rain event from December 13th to December 14th. The C of A exceedance was documented and called in to the Algoma Heath Unit and Spills Action Center. All flows returned to normal by the 16th of December. The plant peak flow was exceeded by 37,821 cubic meters over a two day period following the storm.



Certificate of Instrument Performance
Certificat de Conformité

Company Name / Nom de la Compagnie : CITY OF ELLIOT LAKE

Account Number / No. de compte : 40161788

Certification Number / Numéro du Certificat : 4962964

Part Number / No. de pièce : 4677000	oo POCKET COLOR. CHLORINE REPL.INST
Serial Number / No. de série : ELLI-XXX-21	
External Reference / Référence externe : Wwtp	

Hach Sales & Service Canada Ltd. certifies that your instrument has been serviced, calibrated, verified with standards and now meets new product specifications.

Hach Sales & Service Canada Ltd. atteste que votre instrument a été entretenu, calibré et vérifié selon les normes en vigueur. Ses spécifications actuelles sont équivalentes à celles d'un produit neuf.

Certified by / Certifié par :
Bilton, Stephen

Certification Date / Date de certification :
14-OCT-15



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Company Name / Nom de la Compagnie : CITY OF ELLIOT LAKE

Account Number / No. de compte : 40161788

Certification Number / Numéro du Certificat : 4962964

Part Number / No. de pièce : 4847000	oo DR/890 COLORIMETER, HACH
Serial Number / No. de série : 081090C70922	
External Reference / Référence externe : Wwtp lab	

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Company Name / Nom de la Compagnie : CITY OF ELLIOT LAKE

Account Number / No. de compte : 40161788

Certification Number / Numéro du Certificat : 4962964

Part Number / No. de pièce : 5185000	oo SENSION 6 PORT DO METER
Serial Number / No. de série : 040700001201	
External Reference / Référence externe : Wwtp lab	

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Company Name / Nom de la Compagnie : CITY OF ELLIOT LAKE

Account Number / No. de compte : 40161788

Certification Number / Numéro du Certificat : 4962964

Part Number / No. de pièce : 5201060	PS1201 POWER SUPPLY, INST. ONLY
Serial Number / No. de série : 990600006310	
External Reference / Référence externe : Wwtp effluent turbidity	

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14-OCT-15



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Company Name / Nom de la Compagnie : CITY OF ELLIOT LAKE

Account Number / No. de compte : 40161788

Certification Number / Numéro du Certificat : 4962964

Part Number / No. de pièce : LPV440.99.00012	ee db aa DR3900 SPECTROPHOTOMETER WITH RFID
Serial Number / No. de série : 1518721	
External Reference / Référence externe : Wwtp lab	

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Company Name / Nom de la Compagnie : CITY OF ELLIOT LAKE

Account Number / No. de compte : 40161788

Certification Number / Numéro du Certificat : 4962964

Part Number / No. de pièce : LTV082.53.42001	DRB200 REACTOR, 110V 21X16MM, 4X20MM
Serial Number / No. de série : 13120C0163	
External Reference / Référence externe : Wwtp lab	

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