NORTH HURON

Wingham Sewage Treatment Plant

2015 Annual Report

Wingham Sewage Treatment Plant 2015 Annual Report

Wingham STP ECA 1040-9HAN94 issued May 30, 2014 and #3557-7UNPUR (Aug 11, 2009-Air)

The following is a summary and discussion of the 2015 Wingham sewage treatment plant operation and summary of compliance limits as set forth in the Wingham STP ECA 1040-9HAN94 issued May 30, 2014.

The Rated capacity of the Treatment Unit at 3,400m3/day

Based on Raw sewage flows, the 2015 annual average flows were 1940m3/day which represents 57% of the annual average 3400m3/day capacity. The peak monthly average flow of 2986m3/day in April of 2015 represents 88% of capacity

By-pass Events

There were no bypasses to report in 2015 at the Wingham sewage treatment plant

Compliance limits

The plant consistently removed 98.3% of biological oxygen demand and total suspended solids, 91.3% of phosphorous and 97.6% of total Kjeldahl Nitrogen which is well within the range of removals for a tertiary sewage plant and consistent with previous yearly operations

Operational problems

There were no major problems encountered during the 2015 operating year.

Maintenance

Routine maintenance was performed throughout the year, such as oil changes in gear drives and cleaning UV lights. UV lights will need consideration for updates/back-up unit as it is getting old, and it makes it challenging to find parts.

The gate valves between the lagoons have corroded; the valves are being repaired and will be installed in early 2016.

Power flushing with hydro-vac/sewer cleaning truck increased the frequency in which trunk sewers are cleaned.

Quality Control Monitoring

Monitoring includes an online dissolved oxygen sensor which indicates loading and raw sewage quality, aeration basin solids content and proper operation of the aerators. Secondary clarifier effluent is monitored for dissolved phosphorous and ammonia to determine adequate ferric chloride dosage and nitrification in aeration basins as well as general clarity and surface debris which indicates proper solids removal, adequate solids return to the aeration and wasting rates.

The raw sewage flowmeter measures the flow going to the treatment plant and is used to base dosages and treatment plant capacity. The final effluent flow meter measures flow to the UV lights.

Results of monitoring activities can be viewed on the monthly spreadsheets.

Calibration and maintenance

There are two flowmeters that measure raw sewage in and the final effluent discharge volumes. The flowmeters are calibrated yearly by ICS instrumentation the certificates are stored at the PUC Office. The pH analyzer is calibrated monthly and recorded in the log books.

Efforts to meet effluent objectives

As described in the quality control monitoring section, analytic and visual parameters are used as indicators of process efficiency and should fall within the critical control points. A summary of these values was developed and is in the Wingham sewage treatment facility operations manual for reference and historically have been adequate to maintain compliance.

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Biosolids Generated

A total of 6655 cubic meters of biosolids was removed from cell 1

Complaints

There were no complaints received as a result of the operation of the sewage treatment facility.

This report also includes a data summary, compliance summary, sludge metals summary, biosolids removal summary and a bypass events summary.

This report was prepared by:

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Wingham Sewage Treatment Plant **2015 Data Summary**

Flows	January	February	March	April	May	June	July	August	September	October	November	December	Total(m3)	Avg(m3)	Max(m3)	% Cap
Flows	53856	39831	75316	89590	52784	57949	52644	1706	47974	48201	69748	64109	653708			
Average	1737	1423	2430	2986	1754	1932	1698	1536	1599	1555	2325	2068		1791	89590	52.7
Max/d	2322	1855	3682	11096	2317	4076	2278	2185	2441	2764	3879	3152			11096	

By-passing												
Type												
Est. Volume												
CBOD												
SS												
TP												
TKN												
E. Coli												

Raw Sewage													Avg	Max.	%Removal
CBOD	131	133	79	106	134	187	108	116	111	133	121	99	121	187	98.3
SS	99	115	102	120	199	276	134	155	140	150	127	111	144	276	98.2
TP	2.79	3.05	2.24	2.92	3.68	5.12	2.41	2.09	3.30	3.27	2.80	2.57	3.02	5.12	91.3
TKN	25.35	32.15	17.90	20.60	26.75	26.70	17.60	22.30	29.65	28.07	27.00	22.75	24.73	32.15	97.6
pH	7.94	2.00	3.00	7.51	7.43	7.40	7.49	7.54	7.85	7.79	8.03	7.74	6.81	8.03	
Alkalinity	366	299	333	351	345	383	341	316	370	165	375	348			

Final Effluent															
CBOD	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.08	3.00	
SS	2.0	2.5	2.3	3.0	4.0	2.0	2.0	2.0	2.5	3.7	2.5	3.0	2.63	4.00	
Ammonia	0.10	0.10	0.20	0.10	0.10	0.10	0.12	0.20	0.10	0.10	0.35	0.10	0.14	0.35	
TKN	0.50	0.65	0.50	0.50	0.65	0.85	0.50	0.50	0.70	0.50	0.50	0.90	0.60	0.90	
TP	0.14	0.32	0.17	0.19	0.37	0.28	0.42	0.21	0.26	0.27	0.29	0.27	0.26	0.42	
NO2	0.06	0.10	0.09	0.04	0.08	0.08	4.02	0.10	0.03	0.03	0.06	0.03	0.39	4.02	
NO3	9.76	13.45	5.72	10.86	11.56	10.16	9.56	10.40	12.53	16.77	10.80	7.48	10.75	16.77	
pH	7.87	8.40	7.51	7.44	7.50	7.77	8.41	7.97	7.75	7.64	7.66	7.72	7.80	8.41	
E. Coli	16	48	3	2	2	5	2	1	2	2	22	10	9.54	48	
H_2S>			0.02		0.02				0.02		0.02		0.02	0.02	
Alkalinity	251	299	174	250	183	180	178	149	168	165	213	173	198	299	

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Wingham STP Compliance Summary **2015**

	January	February	March	April	May	June	July	August	September	October	November	December		
Max/day m3	2322	1855	2211	11096	52784	1932	1698	1536	1599	1555	2325	2068	**52784**	m3
Av Day Flow	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	m3
Actual	1737	1423	2336	2986	2317	1702	1698	1536	1599	1555	2325	2068	**1940**	m3
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
CBOD&TSS	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**Total Kg**	
CBOD	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	25.00	
TSS	2.0	2.5	2.3	3.0	4.0	2.0	2.0	2.0	2.5	3.7	2.5	3.0		
Loading Kg	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**		
CBOD Kg	3.47	2.85	4.67	5.97	4.63	3.40	5.09	3.07	3.20	3.11	4.65	4.14	48.26	
TSS Kg	3.47	3.56	5.45	8.96	9.27	3.40	3.40	3.07	4.00	5.70	5.81	6.20	62.30	
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Tot P	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**		
Actual	0.14	0.32	0.17	0.19	0.37	0.28	0.42	0.21	0.26	0.27	0.29	0.27		
TP Load Kg	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**		
Act. TP Kg	0.24	0.45	0.40	0.55	0.86	0.47	0.71	0.32	0.42	0.41	0.66	0.55	6.05	
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
H2S	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
Actual(<)		0.02				0.02			0.02			0.02		
Comp. Y/N		Y				Y			Y			Y		
pH	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**		
Actual	7.87	8.40	7.51	7.44	7.50	7.77	8.41	7.97	7.75	7.64	7.66	7.72		
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
E Coli	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**		
Actual GMD	16	48	3	2	2	5	2	1	2	2	22	10		
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
NH 3&4	**3**	**3**	**3**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**3**	**Total Kg**	
Actual	0.10	0.10	0.20	0.10	0.10	0.10	0.12	0.20	0.10	0.10	0.35	0.10		
NH 3&4 Load/d	0.17	0.14	0.47	0.30	0.23	0.17	0.20	0.31	0.16	0.16	0.81	0.21	3.33	
Limit kg/d	10.7	10.7	10.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	10.7	10.7		
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
NH 3	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**		
Actual	0.001	0.000	0.001	0.000	0.001	0.005	0.007	0.004	0.002	0.001	0.003	0.001		
Comp. Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		

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2015		Wingham STP Sludge Metals Summary							
Parameter									
Date		Mar 31-15	May 27-15	Jul 8-15	Ju 28-15	Jul 22-15	Nov 9-15	Average	
Total Solids		19600	66000	44800	37700	67900	13400	41566.67	
NH 3&4		11.6	1120	146	82.1	249	5.4	269.0	11.1821
TKN			3230	2220	2660	1640	588		
NO2		0.4	0.4	1.6	0.3	0.2	0.2	0.5	0.0215
NO3	<	0.3	0.3	0.7	0.3	0.3	0.3	0.4	0.0152
NO2+NO3		0.4	0.4	2.3	0.3	0.3	0.3	0.7	0.0277
Arsenic		0.3	0.5	0.4	0.4	0.7	0.2	0.4	0.0173
Cadmium	<	0.008	0.028	0.034	0.05	0.18	0.006	0.05	0.0021
Cobalt		0.1	0.23	0.18	0.18	0.22	0.005	0.15	0.0063
Chromium		0.8	2.6	2	1.8	3.2	0.68	1.846667	0.0768
Copper		16	52	41	38	66	13	38	1.5657
Mercury		0.225	0.101	0.093	0.057	0.16	0.023	0.11	0.0046
Potassium		87	120	33	25	88	44	66	0.0178
Molybdenum		0.18	0.6	0.51	0.52	0.8	0.26	0.5	0.0199
Nickel		0.41	1.3	0.98	0.92	1.7	0.29	0.9	0.0388
Phosphorous		550	1600	1200	1000	1800	320	1078	44.8227
Lead		0.8	1.4	1.2	0.8	2.4	0.4	1.166667	0.0485
Selenium	<	0.1	0.3	0.2	0.4	0.5	0.1	0.266667	0.0111
Zinc		8	28	22	21	35	7	20	0.8383
EC cfu DW			56061	4241	531	144330	2089552		
EC cfu WW			37000	19000	2000	980000	2800000		

2015 Biosolids Removal Summary			
Month	**Ret Flow**	**Waste %**	**Total**
January	605	3	544
February	617	3	555
March	566	3	509
April	632	5	948
May	673	3	606
June	698	2	419
July	690	3	621
August	683	5	1025
September	661	2	397
October	651	2	391
November	1058	1	317
December	1080	1	324
		Total m3	**6655**

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Table 2 BYPASS AND OVERFLOW SUMMARY FOR 2015 Wingham STP

	Primary Bypass			Secondary Bypass			Plant Overflows			Collection System Overflo		
MONTH	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)	No. of Events (events)	Duration (hours)	Volume (1000m3)
January	0			0			0			0		
February	0			0			0			0		
March	0			0			0			0		
April	0			0			0			0		
May	0			0			0			0		
June	0			0			0			0		
July	0			0			0			0		
August	0			0			0			0		
September	0			0			0			0		
October	0			0			0			0		
November	0			0			0			0		
December	0			0			0			0		
TOTAL	0	0	0	0	0	0	0	0	0	0	0	

*To be submitted quarterly, within 45 days of the end of the quarter.

Note: An 'Event' means an occurrence or occurrences of a bypass or overflow separated by a period of more than 12 hours between the occurrence(s) or the event(s) and the previous event, at each location.