CASE HISTORY

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TOVEKO Filters

Indian Road - Muskoka

The District Municipality of Muskoka in Canada has a sewage works at Indian Road, which was upgraded to increase its flow handling capability and also improve discharge quality. The plant is designed to handle up to a peak flow of 550m^3 per day (and subject to later expansion to 1000m^3 per day) and has to produce a discharge quality of less than 0.3mg/l total phosphorous (as P) for discharge to Moon River.

As a part of the Contract, a model T-900 TOVEKO continuous gravity sand filter was supplied to provide tertiary filtration of treated wastewater prior to discharge to the river.
Part of the Consent required that the Owner submit a performance report immediately following the completion of the one-year performance testing period following commencement of operation of the Works.

The following summarised data is taken from a paper published by the Project's consultants, Totten Sims Hubicki Associates under their Project reference 52-7940-11. The theoretical design capacity of the plant during the test period was 275m^3 per day.

Daily Flow Data (m^3 per day)			
	Maximum	**Minimum**	**Average**
August	291	195	233
September	324	175	226
October	382	196	251
November	385	199	245
December	353	201	246
January	438	103	210
February	508	110	176
March	345	150	202
April	593	150	252
May	362	175	247
June	255	154	188
July	242	164	207
Average	**373**	**164**	**224**

BOD5 Removal			
	Raw Sewage (mg/l)	**Final Effluent (mg/l)**	**Removal Efficiency %**
August	93.25	2.00	97.86
September	73.25	2.00	97.27
October	58	2.00	96.55
November	53.25	2.00	96.24
December	46.33	2.00	95.68
January	44.33	2.00	95.49
February	50.33	3.00	94.04
March	1221	1.13	99.07
April	128.6	1.1	99.14
May	71.75	2.25	96.86
June	131.33	2.73	97.92
July	179.25	1.13	99.37
Average	**87.58**	**1.96**	**97.76**

Suspended Solids Removal			
	Raw Sewage (mg/l)	**Final Effluent (mg/l)**	**Removal Efficiency %**
August	122.75	1.50	98.78
September	75.5	1.50	98.01
October	68.25	3.20	95.31
November	76.5	2.50	96.73
December	53.00	2.67	94.96
January	76.00	2.00	97.37
February	83.75	2.00	97.61
March	127.75	2.80	97.80
April	98.80	3.06	96.90
May	45.00	1.70	96.22
June	89.00	2.50	97.19
July	96.00	2.63	97.26
Average	**84.38**	**2.34**	**97.23**

Total Phosphorous Removal			
	Raw Sewage (mg/l)	**Final Effluent (mg/l)**	**Removal Efficiency %**
August	3.12	0.06	98.08
September	3.14	0.03	99.04
October	2.12	0.04	98.11
November	2.01	0.05	97.51
December	1.21	0.16	86.78
January	2.33	0.05	97.85
February	1.88	0.11	94.15
March	4.26	0.09	97.89
April	2.48	0.11	95.56
May	2.37	0.11	95.36
June	3.68	0.14	96.20
July	2.13	0.10	95.31
Average	**2.56**	**0.09**	**96.48**

The overall data collected during the test period is summarised as follows:

Parameter	**Average results during test period**	**Consent Conditions**
BOD_5	1.96	10.0
Suspended Solids	2.34	10.0
Total phosphorous	0.09	0.3

The actual Consent conditions are:

Parameter	**Maximum Discharge Concentration (mg/l)**
BOD_5	10
Suspended Solids	10
NH_3 + NH_3-N	0.5 (01 May – 31 Oct) 2.0 (01 Nov – 30 April)
Total phosphorous (as P)	<0.3
Total residual chlorine	0.09

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