

City of Estevan
WT/WWT Service Division
2014
Annual Report on Wastewater
Treatment and Disposal



CITY OF ESTEVAN



MEMORANDUM

DATE: January 26, 2015

TO: Amber Smale, City Manager

FROM: Kevin Sutter, ASCT - WT/WWT Service Division Manager

RE: 2014 Annual Wastewater Report

The wastewater treatment plant (WWTP) was put on line January 1996. In short we take the entire wastewater collection flow and process it using a biological process called Biological Nutrient Removal / Activated Sludge Process. We then discharge the treated effluent to the holding cells and over the summer months SaskPower removes the effluent by pumping from holding cell "J". The waste sludge produced by these processes are de-watered and disposed of at the landfill. A provincial permit to operate that was put into place in December 2012, requires us to maintain an effluent quality-leaving Cell "J".

Some highlights to the plant operation in 2014 are as follows:

- We constructed a new Bio-Solids processing building in 2014. It is now complete and we are going to purchase the equipment involved in the de-watering process in 2015. It is expected to be operational by mid-summer.
- We hired Stantec Consulting to complete a study of the wastewater treatment and storage facilities. This report was given to the City in April 2014. The report was presented to council in October of the same year. This document is an in depth evaluation of the current treatment process and outlines 3 alternatives to keep the facility functional now and into the future. We have presented the

report to SPC as they are partners in the utilization of the effluent and ultimate disposal through evaporation. We have also applied for a Canada Builds Grant to implement the recommendations in this report.

- We held a meeting with SPC to see if we could work together during the next upgrade of the WWTP so that we could produce an effluent that would be suitable for their cooling purposes and eliminate the 180 day storage requirement. In this way the City could save the costs associated in expanding the lagoon Cells.

Even though the WWTP effluent quality spiked from time to time, the holding ponds have been able to buffer these spikes, and as can be noted, the effluent-leaving Cell “J” meets the requirements set out in the new permit to operate except for ammonia and total bacteria counts. We do not disinfect and the plant is being operated at maximum capacity, so this in mind the plant has operated relatively well. SPC uses the effluent as cooling water for SHAND and we do not discharge this effluent into the environment.

We inspect the lagoons once each week and the Water Security Agency completed an inspection as well, the inspection reports from WSA are attached.

The Wastewater treatment system was designed for a maximum daily flow of 6000m³ per day and in 2014 we surpassed that flow 26 of the 365 days. The treatment process as well as the effluent storage is operating at full capacity. Both renewal and expansion are required and council has endorsed the plan to accomplish this through the adoption of the recommendations of the Stantec report and the application to Canada Builds Grant Program to implement the WWTP upgrades as recommended in the report.

I have attached this report and tables for council’s reference as well as to meet the requirements of the permit to operate, that say, that the annual report must be made available to the Water Security Agency.

Cell J - 2014

Test	18-Jun-14	9-Jul-14	20-Aug-14	15-Sep-14	29-Oct-14	18-Nov-14	Permit Objectives
Suspended Solids (mg/l)	17	23	15	28	6	4	20
pH	8.2	8.7	8.4	8.1	8.3	8	
Chlorides (mg/l)	186	172	183	177	175	208	
BOD (mg/l)	3.1	9.1	4.2	2.7	0	3	10
Ammonia (mg/l as N)	3.86	4.12	1.87	5.34	3.49	2.87	3
Total Nitrogen (mg/l as N)	6.4	7.6	4.8	7.9	6	6.3	
TKN (mg/l as N)	6.4	7.1	4.6	7.7	5.2	4.1	
Total Phosphorus (mg/l)	2.79	4.13	4.02	3.99	2.31	1.99	
E Coli (Orgs/100ml)	0	0	10	0	201	63	200
Total Coliform (Orgs/100ml)	2755	24196	172500	5475	1782	1014	2500

**City of Estevan
WWTP
Yearly Report
2014**

	Influent		Average	Effluent		Average	% Removal
	Maximum	Minimum		Maximum	Minimum		
Suspended Solids (mg/l)	1736	26	295.7	155.0	2.3	21.2	93%
Biological Oxygen Demand (mg/l)	315	3.8	189.2	15.8	2.5	7.6	96%
Temperature (C)	21.0	9.0	14.1	8.2	6.9	7.5	
pH	8.8	7.0	7.9	8.2	6.9	7.5	
TKN (mg/l as N)	132.0	26.3	62.9	132.0	1.6	25.6	59%
Total Phosphorous (mg/l as P)	56.0	5.9	14.7	12.6	0.8	4.4	70%
Ortho Phosphorous (mg/l as P)	84.0	0.8	10.7	7.6	0.1	2.2	80%
Ammonia (mg/l as NH3)	57.0	7.1	24.3	27.2	0.1	7.6	69%
Chemical Oxygen Demand (mg/l)	2680.0	158.0	674.4	500.0	0.0	97.1	86%

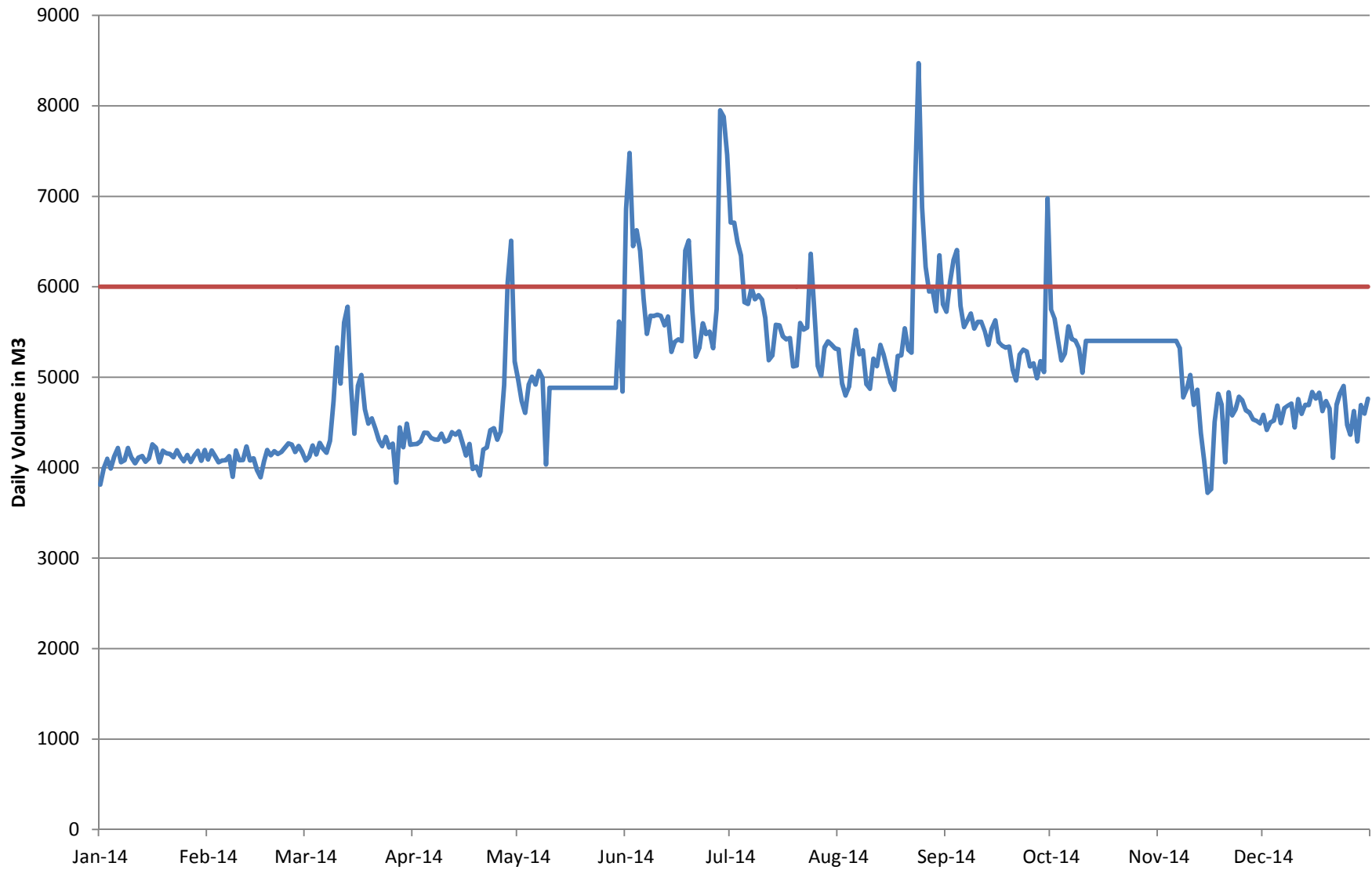
Daily Flows (m3)	8470	3721
Peak Flow (l/s)	219	
Peak one hour flow (l/s)	175	
Peak four hour flow (l/s)	157	

4969

Totals	
Flow (m3)	1,815,161
Septage Received (m3)	24,846
Solids removed dry (Kg)	97821
Effluent removed from Cell J (m3)	1,471,000

City of Estevan WWTP Daily Flows (M3) 2014

Daily Flows
Maximum



Government of Saskatchewan
Lagoon Compliance Inspection

System Name: ESTEVAN WASTEWATER WORKS Remote Inspection ID: 241918
 Approval No: 00003168-02-00
 Date: 12/9/2014 13:00
 Announced: No

Pumping Station #	Number of			Permanent Ventilation	Type of Exhaust	By-Pass Works	By-passes		Potable water outlet	
	Pumps	Wet Wells	Dry Wells				Date	Reported	Present	Backflow Protection
Pumping Stations	Total Pumping Stations: 6									
Lagoons	Total Storage Cells: 7			Total Treatment Cells: 1						
Cell Number	Cell Type	Freeboard Estimate (m)	Odour	Liquid Color	Dyke Condition	Seepage				
C	EVAPORATION	1.5	NONE		GOOD	NONE EVIDENT				
D	STORAGE	1.5	NONE	EMPTY	GOOD	NONE EVIDENT				
B	STORAGE	1.75	NONE	EMPTY	GOOD	NONE EVIDENT				
E	STORAGE	1.5	NONE	CLEAR	GOOD	NONE EVIDENT				
G	STORAGE	1.5	NONE	CLEAR	GOOD	NONE EVIDENT				
F	STORAGE	1.5	NONE	CLEAR	GOOD	NONE EVIDENT				
H	STORAGE	1.5	NONE	CLEAR	GOOD	NONE EVIDENT				
J	STORAGE	1.5	NONE	CLEAR	GOOD	NONE EVIDENT				

Cell Number	Date Started	Date Finished	Starting Freeboard (m)	Ending Freeboard (m)
Lagoon Discharge				
Regulatory Section				
C=Compliant NC=Non-Compliant N/A=Not Applicable				
C	NC	NA	General	Comments

			Approved system EMPA 21(1)	
			Certified operator 63	
			No interconnection between sanitary sewer and storm sewer 14	
			Pumping stations must have mechanically forced air ventilation 15(1)	
			All water outlets that may come into contact with a waste must be equipped with a backflow device 15(2)	
			Facultative Lagoon	
			Two basins in series 16(4)a	
			Reporting	
			Immediate reporting of upset/bypass condition 17(2)	
			Immediate reporting of failure of disinfection equipment 18(2)a	
			Immediate reporting of low chlorine levels 18(2)b	
			Reporting of exceedance see permit	
			Disinfection	
			Disinfection performed as per permit 18(1)	
			Records	
			Maintenance work of treatment components 19(b)	
			Types, dosages and total amounts of chemicals or other substances added 19(b)ii	
			Dates of discharge of sewage and volumes of discharge 19(b)iii	
			Locations from which samples are taken 19(b)iv	
			Results of any tests 19(b)v	
			Maintained in appropriate manner see permit	
			Testing	
			On-site testing completed as required see permit	
			Sampling done as required see permit	

Comments
 LAGOON OBSERVATIONS

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Government of Saskatchewan
Mechanical Plant Compliance Inspection

System Name: ESTEVAN WASTEWATER WORKS Remote Inspection ID: 241916
 Approval No: 00003168-02-00
 Date: 12/9/2014 13:00
 Announced: No

Pumping Station #	Total Pumping Stations: 6			Permanent Ventilation	Type of Exhaust	By-passes		Potable water outlet	
	Pumps	Wet Wells	Dry Wells			Date Reported	Present	Backflow Protection	
1	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y
2	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y
7	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y
8	2	2	0	Y	FORCED DRAFT	N	N/A	N	Y
6	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y
4	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y

Treatment Processes

Process	Comments	Date of last by-pass
MECHANICAL BAR SCREEN		6/16/2011 9:07
GRIT CLASSIFICATION		6/16/2011 9:08

Process	Comments	Date of last by-pass
ACTIVATED SLUDGE PROCESS (SEQUENCING BATCH REACTOR)		6/16/2011 9:09

Process	Comments	Date of last by-pass
DIGESTER		6/16/2011 9:09
BIOLOGICAL NUTRIENT REMOVAL (BNR)		6/16/2011 9:09
BIOLOGICAL PHOSPHOROUS REMOVAL		6/16/2011 9:09

Regulatory Section

C=Compliant	NC=Non-Compliant	N/A=Not Applicable	General	Comments
X			Approved system EMPA 21(1)	
X			Certified operator 63	
	X		No interconnection between sanitary sewer and storm sewer 14	THE CITY HAS BEEN WORKING ON REMOVING STORM WATER FROM THE SANITARY SYSTEM BUT A FEW CONNECTIONS STILL EXIST. THIS IS ONGOING, NONE REMOVED THIS YEAR. THE CITY MUST DEVELOP A PLAN FOR REMOVAL.
X			Pumping stations must have mechanically forced air ventilation 15(1)	
X			All water outlets that may come into contact with a waste must be equipped with a backflow device 15(2)	
			Secondary Treatment Process	
X			Effluent quality demonstrated to meet permit requirements for BOD5 16(3)a(i)	
	X		Effluent quality demonstrated to meet permit requirements for TSS 16(3)a(ii)	THE TSS'S VERY GOOD BUT THE FACILITY HAS BEEN EXPERIENCING CLARIFIER EFFLUENT HOOD ISSUES RESULTING IN MIXED LIQUOR CARRY OVER INTO THE PLANT. THE CITY SHOULD INVESTIGATE WAYS TO IMPROVE FOULING ON THESE HOODS.
			Reporting	
X			Immediate reporting of upset/bypass condition 17(2)	
X			Reporting of exceedance see permit	
			Disinfection	
			Records	
X			Maintenance work of treatment components 19(b)	
X			Types, dosages and total amounts of chemicals or other substances added 19(b)i	
X			Dates of discharge of sewage and volumes of discharge 19(b)ii	
X			Locations from which samples are taken 19(b)iv	
X			Results of any tests 19(b)v	
X			Maintained in appropriate manner see permit	
			Testing	
X	X		On-site testing completed as required see permit	SOME OF THE IN HOUSE SAMPLING MISSED PERIODICALLY. REQUIRED AT LEAST WEEKLY FOR BOD, TSS, VSS, CBOD, PH, SPECIFIC CONDUCTANCE, TKN, AMMONIA-P AND ORTHO-P. BELT FILTER PRESS DATA NOT RECORDED. NO LAND APPLICATION OF BIO SOLIDS THIS YEAR.

Comments
 THE CITY HAS A VALUABLE FILTER PRESS BUILDING PRESENTLY BEING CONSTRUCTED. CONSTRUCTION SHOULD BE COMPLETED BY THE END OF 2014. IN 2015 THE EQUIPMENT WILL BE INSTALLED. PERMIT REQUIREMENTS FOR CBOD, FC MET. REQUIREMENTS FOR TC, TSS AND AMMONIA NOT MET.

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Government of
Saskatchewan

Wastewater Works Compliance Inspection

System Name: ESTEVAN WASTEWATER WORKS Remote Inspection ID: 241914
 Approval No: 00003168-02-00
 Population: 11200 Announced: No
 Date: 12/9/2014 13:00 Person Interviewed: SUTTER, KEVIN

General Section

System Classification: THREE WWT TWO
 Wastewater Treatment Type: MECHANICAL WWC
 Sewage Categorization: MUNICIPAL Discharge Easement: Yes
 Collection Type: GRAVITY
 Comments:

N/A

Contacts

Name	Position	Phone / Fax	Email
SUTTER, KEVIN	MANAGER	Phone: (306) 388-2545 Business: (306) 634-1822 Cell: (306) 421-0114	N/A
BAKER, BILL	CERTIFIED OPERATOR	Phone: (306) 634-6219 Business: (634) 634-8662	N/A
KING, DANIEL	CERTIFIED OPERATOR	Business: (306) 634-1829	N/A
Complaints:			
NONE			
Information Delivered to Operator:			
NONE			

Operator Certification Section

Operator Name	Certification Levels		Expiry Date	Operator is a Supervisor	Certification Exam Written	Taken Training	
	Wastewater Collection	Wastewater Treatment				# of CEUs	Plans to Test or Take Training
BAKER, BILL	NONE	THREE	1-Sep-15	No	Yes	0.6	Yes
SUTTER, KEVIN	NONE	THREE	1-Sep-15	Yes	Yes	0	Yes
KING, DANIEL	TWO	NONE	15-Mar-16	No	Yes	0	Yes

Discharge Area

Discharge Type: INTERMITTENT
 Disinfection: No
 Effluent Treatment: AQUATIC VEGETATION
 Discharge Area: MARSH
 Land Use in Receiving Area:
INDUSTRIAL
 Nearest Residence:
300M
 Latitude: N/A Longitude: N/A
 Discharge Area Comments:
 SASK POWER TAKES 100% OF THE DISCHARGE

Sludge Handling

Final Sludge Disposal: N/A
 Final Sludge Handling: N/A
 Comments:

Kevin Sutter
Kevin Sutter

**City of Estevan
WWTP
Quarterly Report
1st Quarter 2014**

	Influent		Average	Effluent		Average	% Removal
	Maximum	Minimum		Maximum	Minimum		
Suspended Solids (mg/l)	612	26	204	155	6.8	26	87%
Biological Oxygen Demand (mg/l)	315	95	208	14	4	9	96%
Temperature (C)	13	9	11.0	7.7	6.9	7.4	
pH	8.4	7.0	7.98	7.70	6.90	7.39	
TKN (mg/l as N)	132	42.5	66.8	64.0	2.1	24.4	63%
Total Phosphorous (mg/l as P)	33	6.3	12.1	12.6	1.3	4.3	64%
Ortho Phosphorous (mg/l as P)	26.75	2.3	9.8	6.2	0.6	2.3	77%
Ammonia (mg/l as NH3)	49	11.1	27.7	24.0	0.1	7.1	74%
Chemical Oxygen Demand (mg/l)	2680	280	913	500	0	84	91%

Daily Flows (m3)	5778	3812	4250
Peak Flow (l/s)	219		
Peak one hour flow (l/s)	113		
Peak four hour flow (l/s)	103		

Totals	
Flow (m3)	382848
Septage Received (m3)	5893
Solids removed dry (Kg)	29530

**City of Estevan
WWTP
Quarterly Report
2nd Quarter 2014**

	Influent		Average	Effluent		Average	% Removal
	Maximum	Minimum		Maximum	Minimum		
Suspended Solids (mg/l)	1224	143	301	147	10.4	38	87%
Biological Oxygen Demand (mg/l)	305	90	209	16	5	11	95%
Temperature (C)	16	9	12.6	7.8	7.1	7.5	
pH	8.40	7.3	7.90	7.80	7.10	7.46	
TKN (mg/l as N)	111	29	71.8	132	6.25	45.7	36%
Total Phosphorous (mg/l as P)	56	7.4	22.9	12	1	5.2	77%
Ortho Phosphorous (mg/l as P)	27.5	1.5	11.1	4	0.1	1.6	86%
Ammonia (mg/l as NH3)	57	7.8	27.2	27.2	8	16.9	38%
Chemical Oxygen Demand (mg/l)	1350	263	657	224	59	120	82%

Daily Flows (m3)	7950	3914	5123
Peak Flow (l/s)	195		
Peak one hour flow (l/s)	171		
Peak four hour flow (l/s)	157		

Totals	
Flow (m3)	465971
Septage Received (m3)	6235
Solids removed dry (Kg)	30727

**City of Estevan
WWTP
Quarterly Report
3rd Quarter 2014**

	Influent		Average	Effluent		Average	% Removal
	Maximum	Minimum		Maximum	Minimum		
Suspended Solids (mg/l)	337	158	309	57.6	2.3	10	97%
Biological Oxygen Demand (mg/l)	265	3.8	166	13	3	5	97%
Temperature (C)	21	16.8	18.2	8.2	7.4	7.7	
pH	8.63	7.6	7.89	8.19	7.40	7.66	
TKN (mg/l as N)	70	26.3	50.2	38	1.6	18.8	63%
Total Phosphorous (mg/l as P)	20	6.8	11.9	9.25	0.99	3.6	69%
Ortho Phosphorous (mg/l as P)	84	1.5	15.6	7.6	0.62	2.1	87%
Ammonia (mg/l as NH3)	32.4	7.2	18.5	14	0.12	4.9	74%
Chemical Oxygen Demand (mg/l)	1032	158	629	429	0	144	77%

Daily Flows (m3)	8470	4797	5579
Peak Flow (l/s)	193		
Peak one hour flow (l/s)	175		
Peak four hour flow (l/s)	139		

Totals	
Flow (m3)	513282
Septage Received (m3)	6245
Solids removed dry (Kg)	21560

**City of Estevan
WWTP
Quarterly Report
4th Quarter 2014**

	Influent		Average	Effluent		Average	% Removal
	Maximum	Minimum		Maximum	Minimum		
Suspended Solids (mg/l)	1736	186	368	52	2.4	11	97%
Biological Oxygen Demand (mg/l)	230	125	174	10	3	5	97%
Temperature (C)	18	9	14.7	7.9	7.1	7.5	
pH	8.80	7.4	7.87	7.90	7.10	7.53	
TKN (mg/l as N)	92	40	62.6	27	7.5	13.6	78%
Total Phosphorous (mg/l as P)	42.8	5.9	12.1	8	0.8	4.5	63%
Ortho Phosphorous (mg/l as P)	7.8	0.8	6.4	6	0.32	2.9	55%
Ammonia (mg/l as NH3)	40.9	7.1	23.7	4.5	0.1	1.5	93%
Chemical Oxygen Demand (mg/l)	1400	237	498	130	13	41	92%

Daily Flows (m3)	5749	3721	4923
Peak Flow (l/s)	208		
Peak one hour flow (l/s)	113		
Peak four hour flow (l/s)	75		

Totals	
Flow (m3)	453060
Septage Received (m3)	6473
Solids removed dry (Kg)	16004

Month of Jan-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor										R.A.S.	W.A.S.	Effluent					
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	Time/Cycl min	Time/Cycl min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite	
1	3812																								
2	3994	12	7.9		182	230		3.9	3400	3800	3700	900	900	970	920	950	850	90	12	12	4.6	7.5	6.0		
3	4100	12	7.9	115		138		2.6	3600	3700	3300	970	800	950	800	800	700			12	2.6	7.6	4.4	4.2	
4	3990																								
5	4124																								
6	4217	12	8.1			124		1.4	3700	3800	3900	950	880	950	900	950	900	90	12	12	3.2	7.2	3.6		
7	4060	11	8.1		140	164		5	3500	4200	4000	950	900	980	950	950	920			10	5.1	7.1	7.6		
8	4083	11	7.9			64		4.2	3400	4200	4200	960	900	980	980	950	900			11	4.2	7.1	19.0		
9	4219	12	7.8			334		4	4400	4700	4300	950	900	980	980	950	900			12	4	7.3	6.8		
10	4111	13	8	300		304		4.1	3900	4800	4600	980	960	980	950	950	900			12	4.7	7.4	40.8	11.5	
11	4049																								
12	4111																								
13	4130	13	8			466		4.6	3400	4800	4200	970	930	970	950	900	900	80	12	12	5.4	7.2	42.0		
14	4066	12	7.8		290	400		4	3800	4100	4200	970	950	960	940	970	930	60		11	5.3	7.1	6.8		
15	4100	12	7.4			166	9.7	5.4	3600	4400	4700	950	930	980	950	980	950			12	6.9	7.3	7.6		
16	4256	12	7.9			234		5.8	3900	4500	4800	960	950	980	950	950	930			11	6.4	7.2	32.0		
17	4222	12	7.9	125		136	12	2.9	4100	4600	4700	990	970	980	950	960	900			11	6.3	7.3	7.6	3.8	
18	4059																								
19	4187																								
20	4158	10	7.7			374		3.8	4000	5200	4900	990	960	990	980	990	960	60	12	12	4	7.1	3.6		
21	4152	11	8		256	360		4	3900	5200	5000	960	950	980	980	980	980			10	4.8	6.9	5.6		
22	4114	11	8			360		5.2	3800	5200	4800	970	920	990	970	950	900		18	10	4.6	7.2	2.4		
23	4194	11	7.8			522	9.9	5	3700	4900	4800	950	900	980	960	970	970			11	5.8	7.2	9.3		
24	4124	11	7.8	280		526		4.6	3800	5000	4900	960	950	980	960	950	920			11	6	7.2	16.4	4.0	
25	4071																								
26	4139																								
27	4064	11	8		238	282		4	3900	5100	5000	970	950	990	970	980	980	60	18	10	4	7.2	13.2		
28	4135	11	7.9			394		1.8	4300	4800	4900	980	950	990	970	950	950			11	5	7.2	14.8		
29	4189	11	7.9			216		2.4	3900	5200	5000	850	700	990	970	950	900			11	4	7.3	1.6		
30	4076	9	7.8			440		2.4	4300	4800	5100	960	950	970	960	980	950			11	3	7.4	5.0		
31	4195	9	7.8	180		198		6.4	4300	4700	4900	990	970	980	980	990	970			11	7	7.4	6.0	5.2	
TOTAL	127500																								
MIN	3812	9.0	7.40	115		64			3400		3300	850	700	950	800	800	700	60	12			6.9	1.6	3.8	
MAX	4256	13.0	8.10	300		526			4300		5100	990	970	990	980	990	980	90	18			7.6	42.0	11.5	
AVE	4113	11.3	7.88	200		292			3800		4541	958	917	977	951	952	916	73	14			7.2	11.9	5.7	

Peak Flow 95.1 l/s Peak One Hour 72 l/s Peak Four Hour 65 l/s

OTHER NUTRIENTS (mg/l)

BOD Removed (kg) 24768 Sludge removed = 73,000 Kg Hauled

RAW SEWAGE

TREATED EFFLUENT

TKN	67.8	10.0
PHOSPHORUS	Ortho 6.6	1.0
	Total 7.5	1.5
AMMONIA as NH3	26.0	1.0
COD	1233	148.5

Month of Feb-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor										R.A.S.	W.A.S.	Effluent				
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	Time/Cycl min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite		
1	4089																							
2	4189																							
3	4126	11	8.1		82	124		5.8	3800	5200	4700	950	850	990	980	990	970	60	18	11	6.8	7.4	6.8	
4	4061	11	8			244		5.9	3900	5200	4900	980	960	990	980	980	970			11	5.4	7.5	89.0	
5	4079	12	8.1			227		5.3	3900	5100	4700	980	960	990	990	990	980			11	4.9	7.5	109.0	
6	4082	10	8.1			84		5	3800	4800	4600	990	970	990	980	970	950			10	5.6	7.5	39.0	
7	4126	12	8.1			148		4.4	3800	4800	4700	980	970	990	980	980	960			11	4.7	7.7	11.2	
8	3900																							
9	4189																							
10	4083	12	8.1			160		4	3700	4900	4700	980	960	990	980	990	990	60	18	10	3.6	7.7	13.0	
11	4086	11	8			209		4.1	4200	4600	4800	990	980	990	990	990	980			11	4.2	7.5	110.0	
12	4233	11	8.2			268		3.5	3900	4800	5000	980	960	990	990	980	980			11	3.5	7.5	155.0	
13	4079	10	8			612		4	3900	5200	5300	980	960	990	980	990	990			11	3.2	7.3	15.6	
14	4105	10	7.7	270		185		2.5	3800	4900	4700	980	960	990	980	990	980			11	3.7	7.5	21.2	9.8
15	3972																							
16	3894																							
17	4071	12	8			161		3.8	4200	4800	4800	990	990	990	990	990	990	60	18	12	3.8	7.4	121.0	
18	4196																							
19	4138	11	7.8			98		5.4	3700	4800	4600	990	970	990	980	990	970			11	5.9	7.5	39.2	
20	4181	12	8.1			160		3.3	3800	5000	4800	920	900	990	990	980	970			9	3.2	7.5	22.8	
21	4152	10	8	245	310	384	10.5	3.2	3800	5200	4800	980	950	990	970	950	970			10	3.8	7.4	40.0	11.0
22	4174																							
23	4220																							
24	4268	11	7.9			158		3	3800	4400	4400	980	950	990	960	950	940			9	3.5	7.5	12.0	
25	4255	11	8.3		148	154		6	3600	4200	4300	980	950	980	950	970	950			9	4	7.7	6.8	
26	4173	10	8.3			228		5	3700	4200	4400	970	950	990	970	970	960			9	3.5	7.6	10.8	
27	4240	9	8			312		5.4	3600	4200	4500	990	970	980	960	950	850			9	5.3	7.5	22.0	
28	4173	9	7.9	240		198	10.1	5	3600	4200	4400	960	900	970	900					10	4.5	7.5	51.2	12.5
TOTAL	115536																							
MIN	3894	9.0	7.70	240		84			3600		4300	920	850	970	900	950	850	60	18		7.3	6.8	9.8	
MAX	4268	12.0	8.30	270		612			4200		5300	990	990	990	990	990	990	60	18		7.7	155.0	12.5	
AVE	4126	10.8	8.04	252		217			3816		4689	976	951	988	974	978	964	60	18		7.5	47.1	11.1	

Peak Flow 94 l/s Peak One Hour 81 l/s Peak Four Hour 69 l/s

BOD Removed (kg) 27794 Sludge removed = 99,750 Kg Hauled

OTHER NUTRIENTS (mg/l)

	RAW SEWAGE	TREATED EFFLUENT
TKN	81.3	27.2
PHOSPHORUS	15.4	1.7
Ortho Total	18.8	4.4
AMMONIA as NH3	37.0	4.4
COD	591.0	81.8

Month of Mar-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor						R.A.S.	W.A.S.	Effluent									
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	Time/Cycle min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite	
1	4079																								
2	4121																								
3	4246	9	8.4		206			3.8	3400	4500	4400	970	900	980	970	800	700	60	18	11	4	7.5	6.4		
4	4145	10	8		278			4.6	3500	4600	4300	890	950	990	990	990	980			10	3.3	7.3	4.0		
5	4273	12	7.9		906			4	3300	4600	4500	880	950	990	990	970	970			11	3.7	7.2	10.0		
6	4206	9	7.9		550	226		4.4	3400	4600	4400	970	970	990	970	980	800			10	4.5	7.4	4.4		
7	4167	11	7	315	235		9.4	4	4100	4600	4300	990	990	990	950	980	950			11	6.4	7.3	38.4	12.0	
8	4299																								
9	4735																								
10	5330	13	8.1		248	32		1.3	3200	5200	4600	880	700	990	980	980	970	60	20	12	3.1	7.3	78.0		
11	4931	11	8.1		216			4	3400	5200	4400	650	600	850	800	920	810			11	3.2	7.3	17.7		
12	5601	11	8.1		380		8.7	1.6	3500	5700	4500	850	800	980	970	980	950			10	3	7.4	13.6		
13	5778	11	8		436			4.5	3300	5200	4600	400	320	950	800	700	650			11	4	7.6	14.0		
14	4880	10	8.4	95	398		9.3	1.9	3300	4900	4600	300	250	900	850	900	850			12		7.3	3.6	13.8	
15	4376																								
16	4899																								
17	5025	11	8.2		404	132	10.1	2	3100	4500	3900	400	350	800	700	850	700	60	20	11	4.3	7.5	9.2		
18	4644	10	8		660			2.8	3200	4700	4200	400	300	970	880	800	600			10	6	7.6	15.0		
19	4487	12	7.9		292		10.4	3	3600	4600	4400	750	600	900	800	850	700			13	4.8	7.4	16.0		
20	4544	11	8		460			4.2	3500	4800	3900	700	550	950	900	600	450			11	5.8	7.5	21.0		
21	4435	11	8.1	115	30		18.3	4.5	3700	4800	4000	870	650	980	850	780	500			11	3.5	7.4	14.0	4.0	
22	4300																								
23	4238																								
24	4339	11	8		330		9.8	2.5	3400	4400	3700	600	300	700	550	600	450	60	20	11	4	7.5	33.0		
25	4224	11	8.1		486			2.6	3300	4400	3800	400	250	900	750	500	400			10	5	7.4	26.0		
26	4264	10	8.2		366			3	3400	4400	4400	450	300	650	550	650	550			10	4	7.6	24.0		
27	3836	11	8.1		338			3	3500	4600	4500	350	300	900	700	800	600			11	3.4	7.5	13.2		
28	4445	11	8.1	160	96	26		4.4	3600	5000	3500	450	350	980	700	500	400			10	5	7.5		11.2	
29	4225	11	8		257			1	3700	4800	5000	610	390	950	710	980	790			10	4.8	7.4	14.0		
30	4486																								
31	4254	10	8		404		13.4	1.8	4000	4800	4500	450	350	850	700	800	600	60	20	11	3.3	7.5	15.2		

TOTAL	139813																								
MIN	3836	9.0	7.00	95		26			3100		3500	300	250	650	550	500	400	60	18			7.2	3.6	4.0	
MAX	5778	13.0	8.40	315		226			4100		5000	990	990	990	990	990	980	60	20			7.6	78.0	13.8	
AVE	4510	10.8	8.03	171		104			3473		4291	646	551	915	821	814	699	60	20			7.4	18.6	10.3	

Peak Flow 219 l/s Peak One Hour 113 l/s Peak Four Hour 103 l/s

OTHER NUTRIENTS (mg/l)		RAW SEWAGE	TREATED EFFLUENT
BOD Removed (kg)	22510		
Sludge removed =	122,550 Kg Hauled		
TKN		51.3	36.0
PHOSPHORUS		Ortho 7.4	4.0
		Total 10.1	7.1
AMMONIA as NH3		20.2	15.8
COD		592.8	104.8

Month of Apr-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor										R.A.S.	W.A.S.	Effluent					
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3		Set.Solids Cell4		Set.Solids Cell5		Time/Cycle min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite	
												30 min	60 min	30 min	60 min	30 min	60 min								
1	4259	11	8.1		195			1.1	3700	4800	4900	460	320	980	650	900	640	60	20	10	4.4	7.4	24.0		
2	4262	10	8			284		0.8	3900	5500	5000	400	350	950	900	950	700			10	3	7.6	42.0		
3	4294	11	8.1			470		1.2	4500	5500	4700	750	600	850	600	850	650			11	4.2	7.6	14.8		
4	4388	10	8.1			250	4.1	1.6	3900	5000	5000	950	500	980	850	950	900			10	3.3	7.4	14.8	12.0	
5	4385	9	8	265	86			1.8	3900	4800	4700	950	680	980	740	970	780	60	20	11	4.4	7.2	20.8		
6	4328																								
7	4311	10	8			1224		1.6	3600	4800	4800	500	400	650	500	700	500	60	40		3.2		37.0		
8	4309	10	8		112			1.3	3700	4900	4800	410	320	890	600	840	650	40\20		12	4.3	7.1	36.0		
9	4377	11	8			224		1	3800	5300	5000	650	350	950	850	950	650		20	12	3.5	7.4	13.1		
10	4286	11	8		32	116		3.8	4100	5000	4500	800	650	900	650	800	500		40	11	3.8	7.3	24.0		
11	4304	12	8.2	240		312	10.2	2.7	3800	4800	4900	500	400	800	650	900	700		40	12	3.5	7.3		12.0	
12	4391	12	7.8		98		13	1.9	3300	4400	4200	340	260	540	410	520	380	60	10	13	3.3	7.1	56.0		
13	4364																								
14	4400	11	7.8			322	11.1	4.6	3500	4400	4300	400	250	650	550	750	500	60	40	11	5	7.3	26.0		
15	4274	10	7.8			252		3.7	3200	4100	4100	300	250	850	450	550	450		10	11	3	7.4	5.6		
16	4134	10	7.9		54	172		4.1	3100	4200	4000	300	200	850	700	500	450			11	5.9	7.3	26.8		
17	4261	10	7.8	255		486	12.2	4.8	3200	4300	3700	300	200	800	700	500	350			11	3.2	7.2	22.8	13.0	
18	3985																								
19	4013																								
20	3914																								
21	4201	11	8			290	11.8	4	3500	4400	4000	500	600	700	600	600	500	60	10	11	3	7.3	8.0		
22	4223	12	7.8			278		1.1	4400	6700	6600	900	700	950	950	950	950			13	4.1	7.2	55.0		
23	4414	11	8		80	312		0.8	4300	6300	6000	800	400	970	920	920	850			11	3.7	7.6	37.0		
24	4437	11	8			135		1.6	4400	6300	5900	690	500	980	830	980	760	60	40\10	12	3.8	7.2	59.0		
25	4309	12	7.9			196		1.1	4000	6100	5500	400	300	850	700	750	600			12	4.2	7.3	20.6		
26	4397	10	7.9			119		1.5	4200	5400	5500	710	420	960	820	980	800	60	40\10	11	4.5	7.2	41.2		
27	4910																								
28	6047	11	7.8			352		3.8	3500	5200	4900	400	300	950	900	900	850	60	10	12	3.1	7.4	47.0		
29	6507	11	7.7		142	304		4.4	3000	4900	4400	350	250	850	650	800	650			12	5.9	7.4			
30	5174	12	7.7			314		2.6	3000	4400	4200	300	200	650	550	600	450			12	6.8	7.4	40.0		
31																									
TOTAL	133857																								
MIN	3914	9.0	7.70	240		116			3000		3700	300	200	540	410	500	350	60	10		7.1	5.6	12.0		
MAX	6507	12.0	8.20	265		1224			4500		6600	950	700	980	950	980	950	60	40		7.6	59.0	13.0		
AVE	4462	10.8	7.93	253		321			3729		4817	544	392	853	697	796	634	60	24		7.3	30.5	12.3		
Peak Flow	131 l/s	Peak One Hour			121 l/s	Peak Four Hour			112 l/s																

										OTHER NUTRIENTS (mg/l)													
BOD Removed (kg)	32260	Sludge removed =	153,530 Kg Hauled																				
										RAW SEWAGE							TREATED EFFLUENT						
										TKN							36.3						
										PHOSPHORUS							2.5						
										Ortho							7.1						
										Total							24.2						
										AMMONIA as NH3							20.0						
										COD							547.5						
										97.3							102.8						

Month of May-14

Estevan WWTP Summary

@3:00 P.M.		Influent					Mixed Liquor										R.A.S.	W.A.S.	Effluent					
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	Time/Cycle min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite
1	4972	12	7.8			368		3.1	3100	4500	4300	300	200	600	500	500	400	60	10	13	5.6	7.6	17.0	
2	4733	11	7.7	240	110	256		4.7	3300	4600	4500	250	220	650	550	600	500			13	7.5	7.2	74.0	12.0
3	4605																							
4	4920	11	7.8			143	11.6	5.6	3500	4200	3800	300	240	830	610	520	400	60	10	11	5.1	7.5	66.0	
5	5005	10	7.9			166		4.8	3100	4300	4100	250	200	870	510	400	480			11	4.5	7.5	35.0	
6	4919	11	8.4			470	10	2.9	3000	4100	3800	280	200	600	400	500	400	60	10	12	5.3	7.6	22.8	
7	5069	11	8			252		5.8	3400	4400	4000	280	200	900	780	500	400			11	5.6	7.7	67.3	
8	4992	12	8			586	8.6	4.7	3200	4500		300	200	700	650					13	5.8	7.7	42.4	
9	4035	12	8.2	215		282		4.1	3300	4500	4500	300	200	700	500	650	550			13	5.6	7.4	37.6	12.0
10	4882																							
11	4882																							
12	4882	12	7.9			256		5.2	3600	5200	4500	350	280	950	880	600	500	60	10	12	7.2	7.6	24.4	
13	4882	12	7.8			232	9.7	6.6	3900	4900	4600	450	300	950	600	700	650			12	5.6	7.4	30.0	
14	4882	12	7.9			236		6.1	3600	5100	4900	400	300	980	700	900	600			12	6.1	7.6	46.0	
15	4882	12	7.8			178		6.7	3700	5300	4800	400	300	900	650	800	500			12	4.2	7.4	10.4	
16	4882	13	7.7	305		406	8.6	6	3600	4900	5000	400	300	950	800	950	700			13	5.6	7.1	38.8	8.5
17	4882																							
18	4882																							
19	4882																							
20	4882	13	8			358		5.7	3500	4900	5200	350	300	950	650	950	800	60	10	13	5.9	7.6	25.2	
21	4882	13	7.7			226		6.5	3500	5300	4800	400	350	950	950	950	920			13	7	7.1	21.6	
22	4882	14	8			190	12.6	6.1	3600	5200	4900	350	300	950	950	900	700			13	5.3	7.1	21.6	
23	4882	14	8	230		572		3	3700	5600	4900	350	300	950	750	800	600			16	3	7.3	42.4	14.0
24	4882																							
25	4882																							
26	4882	14	8			354		4.1	4100	5900	5500	450	400	950	900	950	900	60	10	14	5	7.3	36.8	
27	4882	14	8			468		3.7	4200	6000	5600	690	510	980	960	980	950			14	3.5	7.2	30.5	
28	4882	14	7.8			224		4.7	4100	5900	5900	550	400	980	950	950	900			14	5.3	7.2	41.6	
29	4882	14	7.9			264	15	4	3800	5900	6000	500	400	950	900	980	940			14	5.8	7.3	111.0	
30	5615	14	8	210		446		3.3	4400	6400		900	600	980	950					14	3	7.4	98.4	15.8
31	4840																							
TOTAL	151355																							
MIN	4035	10.0	7.70	210		143			3000		3800	250	200	600	400	400	400	60	10			7.1	10.4	8.5
MAX	5615	14.0	8.40	305		586			4400		6000	900	600	980	960	980	950	60	10			7.7	111.0	15.8
AVE	4882	12.5	7.92	240		315			3600		4780	400	305	874	731	754	640	60	10			7.4	42.8	12.5

Peak Flow N/A I/s Peak One Hour N/A I/s Peak Four Hour N/A I/s
 BOD Removed (kg) 34439 Sludge removed = 111,620 Kg Hauled

OTHER NUTRIENTS (mg/l)

	RAW SEWAGE	TREATED EFFLUENT
TKN	57.0	36.6
PHOSPHORUS	Ortho 10.0 Total 33.6	1.4 5.1
AMMONIA as NH3	21.2	18.4
COD	863.0	171.8

Month of Jun-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor										R.A.S.	W.A.S.	Effluent				
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	Time/Cycl min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite
1	6861																	60	10	15	4.1	7.4	11.2	
2	7478	15	7.9		28	150		4.7	3500	5400	5400	300	250	950	950	900	800			15	5	7.8	14.0	
3	6450	14	8					4.6	3700	5700	5200	350	300	980	950	800	600			15	4.7	7.7	84.8	
4	6624	14	7.9					4.9	3700	5600	5300	400	350	980	920	900	500			15	5.7	7.8	42.4	
5	6401	14	7.8		320	492		6.5	3800	5500	5000	400	300	950	920	900	800			14	5.4	7.8	77.6	12.0
6	5863	13	8	165		214	9.4	4.6	4200	5300	4900	500	400	950	600	850	500			14				
7	5479																							
8	5680																							
9	5676	14	7.9			240		4.6	4000	5500	5500	850	800	950	900	900	850	60	10	15	5	7.6	23.6	
10	5691	15	7.9			298	12.6	5.2	3900	5600	5400	450	400	960	940	950	900			16	5.3	7.7	66.8	
11	5675	14	7.8		288	468		5.7	4100	5300	5100	500	400	850	700	900	750			14	5.4	7.7	59.0	
12	5575	14	8			178	7.9	5.6	4000	5200	4600	350	300	950	800	800	650			15	6.3	7.7	10.8	
13	5672	14	7.9	125		320		3.7	4300	5600	4600	900	750	980	950	800	650			15	4.3	7.6	26.4	7.4
14	5280																							
15	5395																							
16	5419	15	7.9			180		5.3	4100	5500	5500	930	840	980	950	970	940	60	10	15	3.8	7.4	147.0	
17	5400	15	7.9			232		3.5	4400	5400	4800	920	850	950	920	900	800			15	3.5	7.6	52.8	
18	6393	15	7.8			270		6.8	4600	6100	4900	900	800	950	900	850	750			15	4.4	7.6	63.2	
19	6510	15	7.8		64	692		5.1	4300	5900	5400	950	900	980	950	900	850			15	5	7.6	56.0	
20	5745	15	7.8	150		416		0.8	3500	5600	5900	550	350	950	920	900	700		30	15	2.4	7.7	12.0	5.0
21	5227																							
22	5323																							
23	5596	15	8		186	268		7	3300	3700	3300	300	250	650	500	400	300	60		16	5	7.8	9.6	
24	5478	15	7.9			206		6.2	2800	3400	3500	450	150	500	350	400	350			16	6.4	7.7	5.6	
25	5506	15	7.5			162		6.7	2600	3100	3100	250	200	350	250	300	150			16	3	7.6	9.6	
26	5321	16	8.1			268		3.2	2200	2500		150	100	200	150					16	3.5	7.8	13.2	
27	5754	16	7.3	90		140		3.3	2300	2400	2500	110	90	190	160	140	120			17	5.2	7.5	51.0	9.6
28	7950																							
29	7879																							
30	7460	14	7.7			109		5.8	2200	2800	2800	130	100	200	150	200	150	60	5	15	3.2	7.5	14.0	
31																								

TOTAL	180759																							
MIN	5227	13.0	7.30	90		109			2200		2500	110	90	190	150	140	120	60	5			7.4	5.6	5.0
MAX	7950	16.0	8.10	165		692			4600		5900	950	900	980	950	970	940	60	30			7.8	147.0	12.0
AVE	6025	14.6	7.85	133		268			3595		4635	507	423	781	706	733	606	60	13			7.6	40.5	8.5

Peak Flow 195 l/s Peak One Hour 171 l/s Peak Four Hour 157 l/s

OTHER NUTRIENTS (mg/l)

BOD Removed (kg) 22414 Sludge removed = 42,120 Kg Hauled

RAW SEWAGE

TREATED EFFLUENT

TKN	61.2	64.3
PHOSPHORUS	6.2	0.8
Ortho	10.9	3.5
Total		
AMMONIA as NH3	20.1	12.4
COD	561.0	84.3

Month of Jul-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor									R.A.S.	W.A.S.	Effluent					
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	Time/Cycle min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite
1	6710																	60	10	17	3.5	7.5	10.8	
2	6707	17	7.8			182		5.2	2400	3400	3200	100	100	200	180	250	200			16	4	7.7	16.8	
3	6493	17	7.8			320		5	2600	3400	3200	250	150	400	250	350	250			17	3	7.6	13.6	6.5
4	6345	17	7.8	150	252	236		5.5	2600	3200	3200	250	150	300	200	300	200							
5	5829																							
6	5811																							
7	5983	17	7.8			234		6.9	2500	2900	2600	150	100	250	150	250	150	60	10	17	3.9	7.7	5.2	
8	5861	17	7.8		304	446		5.4	2400	2400	2100	150	100	150	100	100	80			18	4.6	7.7	3.2	
9	5906										2200									18		7.6		
10	5855	17	7.6		64	176	10.2	5.5	2200	2600	2400	100	80	150	100	150	120			18	3.5	7.4	1.6	
11	5655	17	7.8	195		274		5.4	2300	2500	2500	100	80	150	100	150	120			17	3.3	7.4	8.0	4.0
12	5189																							
13	5239																							
14	5579	17	7.8			278	9.8	3.8	2000	2300	1900	100	80	120	100	120	100	60	10	18	5	7.7	12.0	
15	5573	17	7.8			212		2.4	2100	2400	2300	100	80	110	90	120	100			17	5.4	7.6	6.8	
16	5452	17	7.9			460		7	2000	2000	2000	100	60	100	80	125	90			18	3.6	7.6	5.6	
17	5418	17	7.8		106	160		5.2	1800	1900	1900	70	40	70	50	100	70	40	8	18	4.2	7.7	6.4	
18	5433	18	7.9			160	10.3		2000	2100	1900	100	70	120	80	100	70			19		7.7	7.2	
19	5119																							
20	5131																							
21	5600	18	7.6		1138	1376			2100	1900	1900	120	70	110	80	150	125	30	10	18		7.7	7.6	
22	5528	18	7.8			186			2300	2200	2200	120	100	120	100	140	125			18		7.7	4.4	
23	5548	18	7.9			290	9.4		2200	2100	2200	80	70	90	80	120	100			19		7.8	12.8	
24	6364	17	8			162		6.9	2200	2400	2300	140	80	150	90	160	90			19	3	7.8	10.0	
25	5755	17	8	205		192	8	7.4	2600	2600	2400	130	100	130	100	140	110			18	4.1	7.7	4.0	4.2
26	5130																							
27	5017																							
28	5329	17	8		40	224		7	2400	2200	2200	140	100	130	100	120	100	30	10	18	5	7.7	6.0	
29	5397	18	7.7			158		7.4	2600	2200	2200	160	140	120	110	140	130			19	3	7.6	0.8	
30	5359	18	7.8			158		5.4	2700	2400	2600	200	160	150	140	220	200			19	3	7.7	3.2	
31	5317	18	7.9	3.8		192	7	7	2800	2500	2700	200	160	170	150	240	200			19	3	7.8	3.6	3.8
TOTAL	175632																							
MIN	5017	17.0	7.60	4		158			1800		1900	70	40	70	50	100	70	30	8			7.4	0.8	3.8
MAX	6710	18.0	8.00	205		1376			2800		3200	250	160	400	250	350	250	60	10			7.8	16.8	6.5
AVE	5666	17.3	7.82	138		289			2324		2368	136	99	157	116	169	130	47	10			7.7	7.1	4.6

Peak Flow 183 l/s Peak One Hour 150 l/s Peak Four Hour 103 l/s

BOD Removed (kg) 23504 Sludge removed = 61,300 Kg Hauled

OTHER NUTRIENTS (mg/l)

	RAW SEWAGE	TREATED EFFLUENT
TKN	47.3	32.1
PHOSPHORUS	Ortho 7.0 Total 8.8	0.9 3.7
AMMONIA as NH3	14.1	11.1
COD	717.3	167.5

Month of Aug-14

Estevan WWTP Summary

@3:00 P.M.		Influent					Mixed Liquor										R.A.S.	W.A.S.	Effluent					
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3		Set.Solids Cell4		Set.Solids Cell5		Time/Cycle min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite
												30 min	60 min	30 min	60 min	30 min	60 min							
1	5307																							
2	4930																							
3	4797																							
4	4893																							
5	5257	20.6	8.63			190		4.47	2580	5310	3120	270	220	970	920	650	500	30	10	19.4	4.13	8.2	12.0	
6	5523	18.3	7.72			246		3.05	2800		3620							30	10	19	4.62	7.6	26.0	
7	5253	18.6	7.73	150		440		2.17	3110	4220	3340	270	220	920	840	540	420	30	10	19.6	3.8	7.5	57.6	
8	5296	18.6	7.85			340		3.77	2970	4580	3550	290	220	850	730	620	510	30	10	19.8	5.16	7.5	56.8	
9	4921																							
10	4871																							
11	5206	16.8	7.83			72		6.31	3450	4150	3830	770	580	920	840	880	770	30	10	18.5	4.25	7.4	17.0	
12	5122	17.2	7.89			60		5.35	3370	4150	3640	730	520	860	740	740	580			19.1	4.7	7.4	14.0	
13	5358	19	7.9			188		4.4	3300	4100	3700	700	500	800	700	800	600	8		20	4.2	7.7	1.6	
14	5253	18	7.8			686	8.6	3.6	3400	4200	4100	650	250	700	400	850	700			20	3.5	7.5	6.0	
15	5090	19	7.8	265		148		4	3300	4800	4300	500	300	950	850	900	800			19	4.1	7.6	1.2	
16	4938																							5.2
17	4860																							
18	5236	19	8			580		5.8	3750	4760	4040	730	540	920	850	840	690	30	6	19.8	3.8	7.5	21.0	
19	5240	19	7.7			98	8.6	2	3500	4700	4600	650	500	900	800	900	855			20	3.4	7.6	11.2	
20	5539	19	7.8			580		3.1	4000	4800	4700	750	600	900	750	850	600			20	4.4	7.7	2.0	
21	5303	19	8			154		3.1	3900	5000	4800	650	500	900	800	850	700			20	3.9	7.7	2.8	
22	5270	20	7.9	205		422	9.7	1.4	3600	5200	4800	600	550	900	850	800	650			20	2.8	7.6	4.8	
23	7116																							3.2
24	8470																							
25	6876	19	7.8			320		2.8	3300	4800	4500	500	400	950	850	900	800	30	6	18	3.3	7.7	1.6	
26	6219	19	7.9			188		5.2	3400	5100	4600	550	400	950	850	900	800			18	4.1	7.6	2.0	
27	5949	19	8.2			242	10.1	5.1	3600	4900	4300	500	400	900	800	800	650			19	5	7.6	0.8	
28	5960	20	8			382		3.8	3600	4800	4500	500	400	900	800	850	700			20	3.7	7.7	7.2	
29	5730	20	7.9	135		368		3	3600	4700	4500	650	500	750	600	800	650			19	3.7	7.7	15.2	
30	6348																							3.5
31	5805																							
TOTAL	171936																							
MIN	4797	16.8	7.70	135		60			2580		3120	270	220	700	400	540	420	30	6			7.4	0.8	3.2
MAX	8470	20.6	8.63	265		686			4000	8.6	4800	770	600	970	920	900	855	30	10			8.2	57.6	13.0
AVE	5546	18.9	7.91	189		300			3396	9.7	4134	570	422	886	776	804	665	30	9			7.6	13.7	6.2
Peak Flow	193 l/s	Peak One Hour			175 l/s	Peak Four Hour			139 l/s															

OTHER NUTRIENTS (mg/l)

BOD Removed (kg) 31383 Sludge removed = 81,700 Kg Hauled

	RAW SEWAGE	TREATED EFFLUENT
TKN	54.3	12.4
PHOSPHORUS	Ortho 13.7 Total 13.5	2.1 4.9
AMMONIA as NH3	13.9	1.9
COD	692.3	217.5

Month of Sep-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor										R.A.S.	W.A.S.	Effluent				
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3		Set.Solids Cell4		Set.Solids Cell5		Time/Cycl min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite
												30 min	60 min	30 min	60 min	30 min	60 min	min	min					
1	5724																							
2	6047	18.8	8			239		2.2	3600	5200	4800	780	610	950	890	940	870	30	6	19.2	3.3	7.6	14.4	
3	6290					176																	23.6	
4	6406			200		322																	25.6	4.0
5	5791					144																	18.8	
6	5554																							
7	5629																							
8	5705	19	7.9		158	172		3	3600	5300	5000	400	300	950	850	950	900	30	6	19	4.3	7.6	7.6	
9	5538	17	7.8			328		5.5	3800	5300	5000	450	350	900	800	900	850			18	3.1	8.0	8.0	
10	5613	17	7.8			318		2.4	4200	4900	5500	900	700	950	850	980	940			18	3.8		2.3	
11	5613	17	7.9			366		1.7	3800	5200	4900	600	450	950	900	950	900			18	2.9		12.8	
12	5508	18	8	165		222		4.1	3800	5200	5000	400	300	950	900	950	900			18	3		3.6	3.8
13	5357																							
14	5539																							
15	5630	19	7.9			600		2.4	4000	5500	4900	750	400	950	900	950	850	30	6	19	3	7.6	15.8	
16	5388	19	7.9			508		4	4100	5300	4900	800	600	950	850	950	850			19	4	7.7	4.4	
17	5349	19	8			98		2.8	3900	5400	5000	750	550	950	850	950	800			19	3	7.6	2.4	
18	5326	19	8		362	550		3.1	4400	5200	5200	700	400	800	550	800	600			20	4	7.7	3.6	
19	5337	19	8	165		452		3	4200	5600	5300	800	650	950	850	950	800			20	3.8	7.7	10.4	3.5
20	5089																							
21	4963																							
22	5253	19	7.8			684	10.3	1.2	3900	5400	5400	800	600	960	900	960	900	30	5	19	3.4	7.7	3.2	
23	5306																							
24	5285	19	7.8		244	412		2.4	4200	5700	5600	900	800	980	950	980	950			19	5.2	7.8	17.2	
25	5120	21	8	155		130		1.2	3900	5400	5500	700	550	900	850	950	940		10	20	2.4	7.6	6.8	7.5
26	5153																							
27	4988																							
28	5178																							
29	5058	17	8.1			298		2.4	4400	4900	5000	950	800	970	900	970	900	30	6	17	4	7.8	6.0	
30	6977	18	8			376		5.8	3800	5700	5400	700	500	980	950	950	900			18	3.8	7.7	4.8	
31																								
TOTAL	165714																							
MIN	4963	17.0	7.80	155		98			3600		4800	400	300	800	550	800	600	30	5			7.6	2.3	3.5
MAX	6977	21.0	8.10	200		684			4400		5600	950	800	980	950	980	950	30	10			8.0	25.6	7.5
AVE	5524	18.5	7.93	171		337			3975		5150	711	535	940	859	943	866	30	7			7.7	10.1	4.7

Peak Flow 127 l/s Peak One Hour 104 l/s Peak Four Hour 89 l/s

OTHER NUTRIENTS (mg/l)

BOD Removed (kg) 27600 Sludge removed = 72,600 Kg Hauled

RAW SEWAGE

TREATED EFFLUENT

TKN	49.1	11.8
PHOSPHORUS	26.1	3.2
Ortho	13.3	2.3
Total		
AMMONIA as NH3	27.6	1.6
COD	477.5	45.8

Month of Oct-14

Estevan WWTP Summary

@3:00 P.M.		Influent						Mixed Liquor										R.A.S.	W.A.S.	Effluent				
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	Time/Cycl min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite
1	5749	18	7.8			326		2.7	3700	5200	5300	450	300	950	900	950	900	30	10	18	2.6	7.6	7.6	
2	5648	17	7.9	125		446		4.1	3700	5400	5500	450	350	950	830	950	900			17	3.1	7.9	26.8	4.2
3	5422																							
4	5187																							
5	5261																							
6	5562	17	8.1			656		5.7	4300	5600	5400	850	800	950	900	900	860	30	10	17	4.3	7.8	4.0	
7	5421	17	8			486		3.7	4300	5200	5200	550	400	800	700	900	850			17	3.2	7.8	2.8	
8	5405	18	8.4																					
9	5323	18	8.1			286		2.8	4200	5900	5900	700	550	950	900	950	900			18	5	7.9	5.2	
10	5050	18	8.1	161		150		5.2	4300	5900	6700	700	550	950	850	980	970		20	18	3.6	7.8	4.0	4.6
11	5403																							
12	5403																							
13	5403																							
14	5403																							
15	5403	18	8.4																					
16	5403	18	8.3																					
17	5403	18	8.8																					
18	5403																							
19	5403																							
20	5403	18	7.8			236		4.2	4000	5300	5300	700	400	900	800	950	850	30	20	19	5.2	7.4	6.0	
21	5403	18	7.9			106		3.9	4200	5800	5300	650	500	950	850	950	850			19	4.8	7.4	3.2	
22	5403	18	7.6			176		4	4300	5700	5400	800	700	980	900	980	900			18	4.4	7.6	5.6	
23	5403	18	7.9			244		3.6	4500	5600	5200	850	800	920	900	920	900			19	4	7.5	7.4	
24	5403	18	7.7	165		366		3.8	4200	5300	5600	800	650	900	800	950	900		10	17	3.7	7.2	2.4	2.5
25	5403																							
26	5403																							
27	5403	17	7.6			778		3.7	4100	5600	5300	700	550	900	800	950	900	30	10	17	3.4	7.3	12.0	
28	5403																							
29	5403	17	7.6			330		2.8	4300	5600	5100	850	600	950	850	930	700			16	3.1	7.1	3.2	
30	5403	16	7.7			402	24.8	4.6	3800	4900	5500	600	550	700	500	950	750			16	3.5	7.1		
31	5403	16	7.6	205		200		4.8	3400	4500		550	400	600	450					16	3.2	7.1	4.5	3.5

TOTAL	167484																							
MIN	5050	16.0	7.60	125		106			3400		5100	450	300	600	450	900	700	30	10			7.1	2.4	2.5
MAX	5749	18.0	8.80	205		778			4500		6700	850	800	980	900	980	970	30	20			7.9	26.8	4.6
AVE	5403	17.5	7.96	164		346			4087		5479	680	540	890	795	944	866	30	13			7.5	6.8	3.7

Peak Flow 107 l/s Peak One Hour N/A l/s Peak Four Hour N/A l/s

BOD Removed (kg) 26848 Sludge removed = 26,800 Kg Hauled

OTHER NUTRIENTS (mg/l)

	RAW SEWAGE	TREATED EFFLUENT
TKN	56.0	10.7
PHOSPHORUS	Ortho 6.9 Total 20.4	5.1 7.2
AMMONIA as NH ₃	15.3	1.1
COD	352.3	37.3

Month of Nov-14

Estevan WWTP Summary

@3:00 P.M.		Influent					sludge %	Mixed Liquor								R.A.S.	W.A.S.	Effluent						
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l		D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3		Set.Solids Cell4		Set.Solids Cell5		Time/Cycl min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite
1	5403																30	10						
2	5403																							
3	5403																							
4	5403	16	7.6		144	256	4.2	2700	3000	2700	300	200	300	220	300	200	30	4	16	3.5	7.5	52.0		
5	5403	15	7.8			144	5.1	3100	2700	2800	400	300	300	200	350	200			16	6.5	7.5	15.2		
6	5403	16	7.8			272	6.4	2700	3400	3000	200	200	600	500	300	200			15	6.8	7.4	19.6		
7	5322	15	7.7	170		178	6.4	2900	3700	3500	250	200	550	300	400	350		8	15	6	7.6	6.8	3.0	
8	4778																							
9	4870																							
10	5024	13	7.7		260	466	4.2	3100	3700	3300	300	250	700	550	500	300	30	8	14	5.7	7.5	1.6		
11	4695																							
12	4860	14	7.9			318	11.9	6	2800	3400	3200	200	200	450	350	400	300		13	7	7.6	2.4		
13	4385	14	7.8			198	4	2800		3100	220	200			350	300			14	3.8	7.4	17.6		
14	4085	14	7.9	150		1052	7.2	3000	3100	3000	300	250	400	300	300	250			13	7	7.6	15.2	6.2	
15	3721																							
16	3761																							
17	4507	13	7.8			180	6.5	2600	3000	3000	300	200	400	300	750	250	30	8	13	5.3	7.6	3.6		
18	4817	13	8			152	8.6	1500	3800	3400	100	50	600	500	400	300	30	0	13	7.2	7.9	6.8		
19	4693	14.6	7.8			162	8.6	1480	3700	5290	100	50	500	370	550	400	25		15.5	8.6	7.8	35.2		
20	4059	15.7	7.4			74	4.7	3500	3320	3400	490	390	250	220	260	220			13.2	4.7	7.3	10.4		
21	4833	14	7.9	145	76	140	6.4	3500	3900	4000	350	300	350	320	450	400	25	8	14	6.8	7.8	18.4	6.5	
22	4580																							
23	4642																							
24	4783	13	7.8			168	6	3400	4000	3800	450	400	800	700	650	550	25	8	13	5.6	7.5	13.2		
25	4742	13	7.9		74	90	2.7	3500	4200	4200	600	400	850	750	850	750			13	4.4	7.6	10.4		
26	4634	13	7.7			126	3	3800	4200	4400	750	600	900	800	850	700			13	3.6	7.5	19.2		
27	4608	13	7.7			736	5.7	3700	4600	4500	650	400	900	700	900	800			13	3.6	7.3	2.0		
28	4535	15	8.1	180	272	164	5.9	3980	4500	3370	780	500	900	780	900	660			14	4.5	7.6	30.4	7.2	
29	4516																							
30	4488																							
31																								
TOTAL	142355																							
MIN	3721	13.0	7.40	145		74		1480		2700	100	50	250	200	260	200	25	0			7.3	1.6	3.0	
MAX	5403	16.0	8.10	180		1052		3980		5290	780	600	900	800	900	800	30	10			7.9	52.0	7.2	
AVE	4745	14.1	7.79	161		271		3003		3553	374	283	574	462	526	396	28	7			7.6	15.6	5.7	

Peak Flow 196 l/s Peak One Hour 104 l/s Peak Four Hour 75 l/s

BOD Removed (kg) 22140 Sludge removed = 16,610 Kg Hauled

OTHER NUTRIENTS (mg/l)

	RAW SEWAGE	TREATED EFFLUENT
TKN	60.2	12.4
PHOSPHORUS	Ortho 6.3 Total 7.7	2.5 4.0
AMMONIA as NH3	29.6	1.7
COD	799.5	68.3

Month of Dec-14

Estevan WWTP Summary

@3:00 P.M.		Influent					Mixed Liquor										R.A.S.	W.A.S.	Effluent						
Date	Flow Est. M3	Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3		Set.Solids Cell4		Set.Solids Cell5		Time/Cycle min	Time/Cycle min	Temp C	D.O. mg/l	pH	S.S		BOD
												30 min	60 min	30 min	60 min	30 min	60 min						Composite	Composite	
1	4584	13	7.6		324	1036	10.2	4.1	3800	4800	4600	700	500	900	800	850	750	25	8	12	5.6	7.9	12.4		
2	4418	12	7.9			186		3.8	3600	4900	4500	500	400	900	750	850	700		6	12	4.7	7.6	2.4		
3	4501	12	7.8			392	17.1	3.2	4000	4400	4300	800	550	900	550	900	650			12	3.6	7.7	9.6		
4	4519																								
5	4686	13	7.7	195		360		6.2	3700	4200	4400	750	500	850	500	850	700		6	12	5.2	7.5	38.0	6.4	
6	4493																								
7	4659																								
8	4685																								
9	4708	13	8.1		37.2	216	14.2	3.8	4200	4800	5500	800	700	900	850	900	850			13	3.5	7.6	12.8		
10	4445	15	7.9					4	4300	5200	5300	840	700	920	840	960	870	25	6	15.4	4.6	7.6			
11	4759	13	7.8			880		3	4500	5300	5800	850	800	900	850	950	900			14	4	7.6	9.6		
12	4594	14	8.1	195		266	10.7	3.6	4800	4800	5600	900	800	950	800	900	850		8	14	4.8	7.6	4.0	3.5	
13	4694																								
14	4693																								
15	4835	14	8		196	450	12.8	4	4300	5300	5700	800	650	950	850	900	850	25	8	13	4	7.3	1.2		
16	4765	13	7.9			336		4.6	4100	5100	5300	800	700	900	800	950	900			13	4.8	7.4	5.2		
17	4828	13	7.9			588	12.1	3.8	4000	4800	5400	750	550	950	750	980	900			13	4.2	7.6	7.2		
18	4626	12	7.8			330	10.1	5	3900	4700	5000	800	700	950	900	950	900			13	3.2	7.3	8.4		
19	4735	15	7.8	230				4.2	3900	4600	5000														10.3
20	4654																								
21	4109																								
22	4694	13	7.8		306	380		3.2	3600	4000	4300	350	300	700	600	600	400	25	8	13	3.3	7.6	17.2		
23	4826	12	7.9			364	10.6	4.1	3500	3900	4400	400	300	450	350	750	550			12	3.9	7.7	4.0		
24	4902	12	7.8	170		244		4	3600	3800	4400	300	400	550	450	600	550		6	12	3.9	7.7	7.6	3.8	
25	4479																								
26	4364																								
27	4626																								
28	4290																								
29	4691	10	7.7			1736		5.9	3300	3200	4100	550	450	400	300	800	800	25	6	9	5.6	7.3	8.8		
30	4599	10	7.9			208	9.8	5	3000	3100	4000	500	400	400	300	750	650			9	4	7.3	10.8		
31	4762	9	8			328		5.3	3000	2600	4100	300	200	200	150	750	600			10	3.8	7.3	6.0		
TOTAL	143222																								
MIN	4109	9.0	7.60	170		186			3000		4000	300	200	200	150	600	400	25	6			7.3	1.2	3.5	
MAX	4902	15.0	8.10	230		1736			4800		5800	900	800	950	900	980	900	25	8			7.9	38.0	10.3	
AVE	4620	12.5	7.86	198		488			3847		4826	649	533	759	633	844	743	25	7			7.5	9.7	6.0	

Peak Flow 208 l/s Peak One Hour 113 l/s Peak Four Hour 75 l/s

BOD Removed (kg) 27427 Sludge removed = 116,630 Kg Hauled

OTHER NUTRIENTS (mg/l)

RAW SEWAGE TREATED EFFLUENT

TKN	71.7	17.7
PHOSPHORUS	6.0	1.1
	Ortho	
	Total	2.1
AMMONIA as NH3	26.4	1.9
COD	343.3	16.3