CITY OF PORTAGE LA PRAIRIE
WATER POLLUTION CONTROL FACILITY
2015 ANNUAL REPORT

The Water Pollution Control Facility (WPCF) is the wastewater treatment facility that services the domestic and industrial users within the City of Portage la Prairie. Throughout the City, there are 13 lift stations that convey wastewater to the treatment facility. Domestic strength sewage is also received from Southport and the Peony Farm. WPCF receives high strength industrial wastewater from the Poplar Bluff and the McMillan Industrial parks. Each industrial park has a large anaerobic digester to pre-treat the industrial flows prior to being combined with the domestic wastewater and pumped to the WPCF secondary treatment system. The secondary system is comprised of 4 basins. Each basin will cycle through timed stages of fill, aeration, and settle providing the necessary treatment to remove the waste products from the water. The treated water is disinfected by Ultraviolet light and then discharged into the Assiniboine River.

Plant Performance

The WPCF treated 6029.4 m3 of incoming wastewater, compared to the total flow of 6483.2 m3 in 2014. The total flow was comprised of 2713.6 m3 from municipal sources, 1934.7 m3 was from the McMillan Industrial Park, and 1381.1 m3 was contributed from the Poplar Bluff Industrial Park. Industrial contribution is 55% of total incoming flow. The facility performed very well throughout 2015. There were 10 exceedence events throughout the year on 9 separate days. This equates to a compliance rating of 98%. It should be noted that the remainder of the year, the facility was well below the allowable limits and treated wastewater

WPCF experienced a few operational issues throughout 2015. Throughout the year, Poplar Bluff industrial park was discharging loads of suspended solids to the WPCF secondary system that were well in excess of the industrial services agreement. All efforts were made to ensure the secondary treatment process was able to treat the load sufficiently.

For a two week period in August, all three industries had periods of shut down which significantly reduced the flow and loads to the secondary system. However, due to the high loads received leading up to these dates, combined with the high probability of BVF upsets during start up, it was not possible to clean out any basins as part of the regular summer maintenance schedule. This maintenance work has already been prevented for the last two summers due to industrial upsets. It is anticipated to start preparations for this work early in the spring and be able to clean out two basins during the summer of 2016.

A reoccurring concern is the odourous gas being emitted from the onsite Industrial Pre-treatment facility, which is operated by McCain Foods Ltd. City of Portage la Prairie staff communicates daily to weekly requests to McCain to check the system for displaced caps from sample ports that allow the gas to escape. They have indicated that upgrades will be made to the gas collection system however, these changes are not expected to reduce odour. Odour is a component of the City of Portage environmental license however, in order for Manitoba Conservation to enforce this portion, three written complaints- from three different sources, must be received to their department.

License Exceedence Events

Manitoba Conservation issues an operating license to the facility detailing the maximum discharge limits that the effluent wastewater must be within. There are limits for Total suspended solids, Biochemical Oxygen Demand, Ammonia, and Total and Fecal Coliforms. Any exceedance is reported to Manitoba Conservation within 24 hours of the limit being surpassed.

Total Suspended Solids

The Environmental license permits a maximum daily discharge of 30mg/L of total suspended solids. In 2015, this was exceeded on 9 occasions. The dates and reasoning are listed;

January 3- low treatment efficiency due to low basin temperatures, experienced during holiday shutdowns from industries. Industrial flows provide heat and nutrients that the bacteria in the secondary system require to perform. Loss of temperature and food decreased bacteria activity and decreases plant efficiency

April 15 & 16- strong winds caused turbulence in the basins and prevented properly settling of materials, washed out solids in EQ basin required an extra day to move through system

April 23 & 24- secondary treatment computer automation system was not working properly and caused multiple problems with the treatment system including random start up and shut down of blowers. Treatment and settling was affected. This was ultimately attributed to a faulty power control card in the PLC system.

May 17 & 18- extreme weather caused power outages that affected the secondary treatment system.

July 29- decant header was re-submerged back into the liquid in the basin causing washout of solids materials that was trapped in the header.

November 24- SBR #3 was taken offline to repair an actuator. Decrease in treatment capacity resulting in higher TSS in effluent.

Biological Oxygen Demand

The Environmental operating license permits a maximum daily discharge of 30mg/L. There was one exceedance of this parameter.

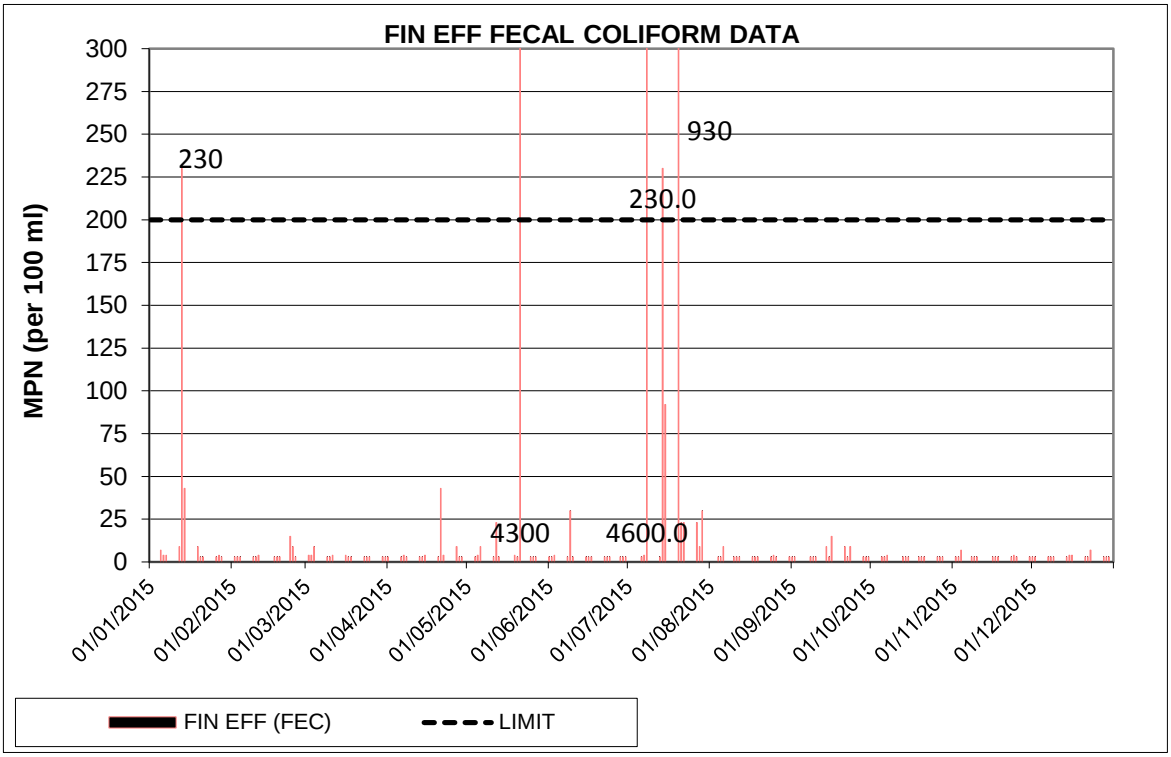
April 23- computer automation system was not working properly and caused multiple problems with the treatment system including random start up and shut down of blowers. Treatment and settling was affected.

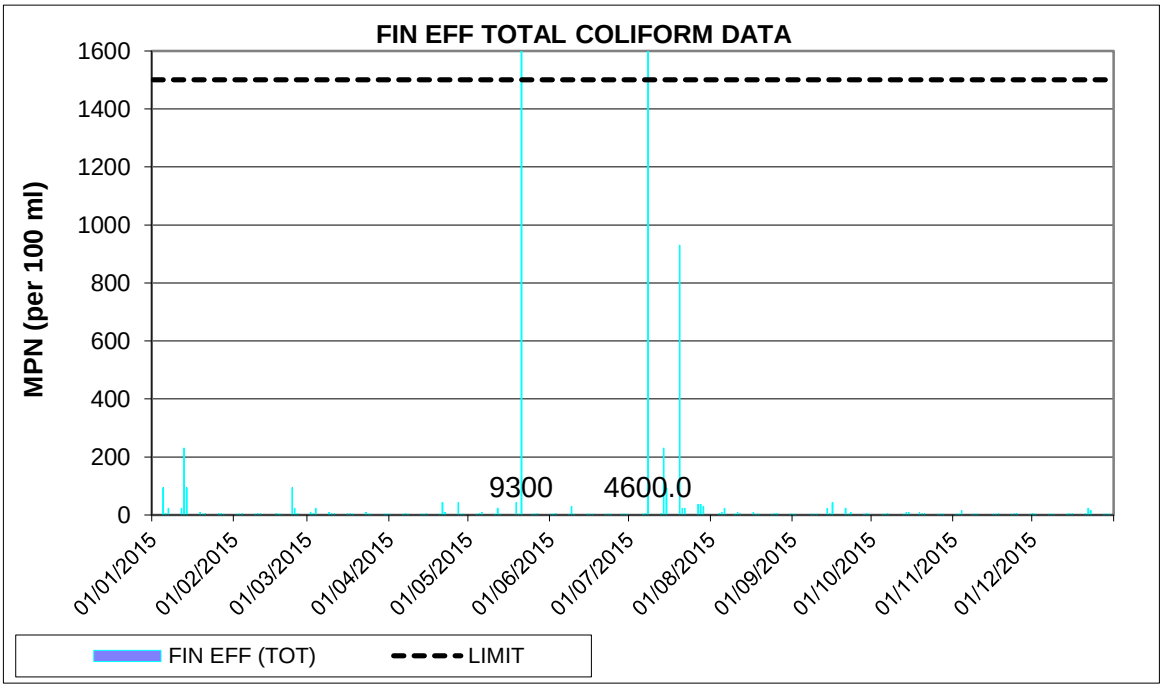
Ammonia

The allowable amount of ammonia that can be discharged in the effluent changes each month. There were no incidents of ammonia exceedance.

Coliforms

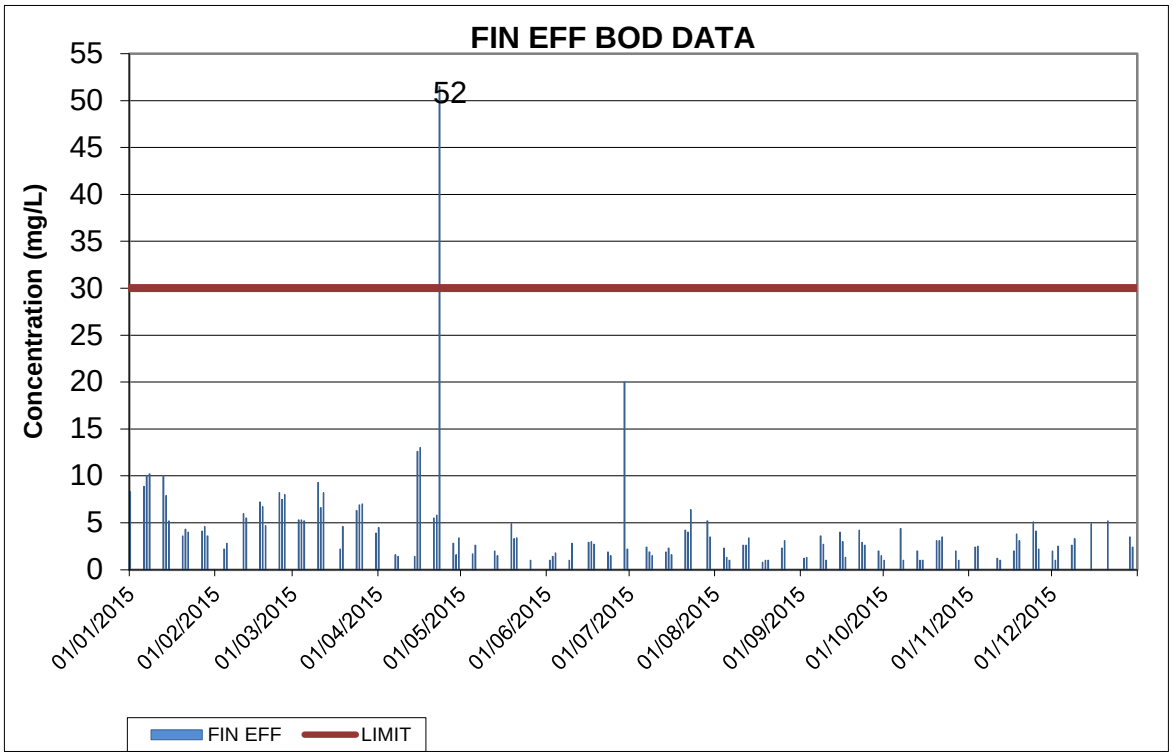
Total and fecal coliforms are measured three times per week. The limit for total coliforms is based as a monthly geometric mean of 1500 CFU/100mL and fecal coliform limit is 200 CFU/100mL. There were individual days were the results were reported above the limits but the monthly geometric mean limit was not exceeded. These daily events do not need to be reported.

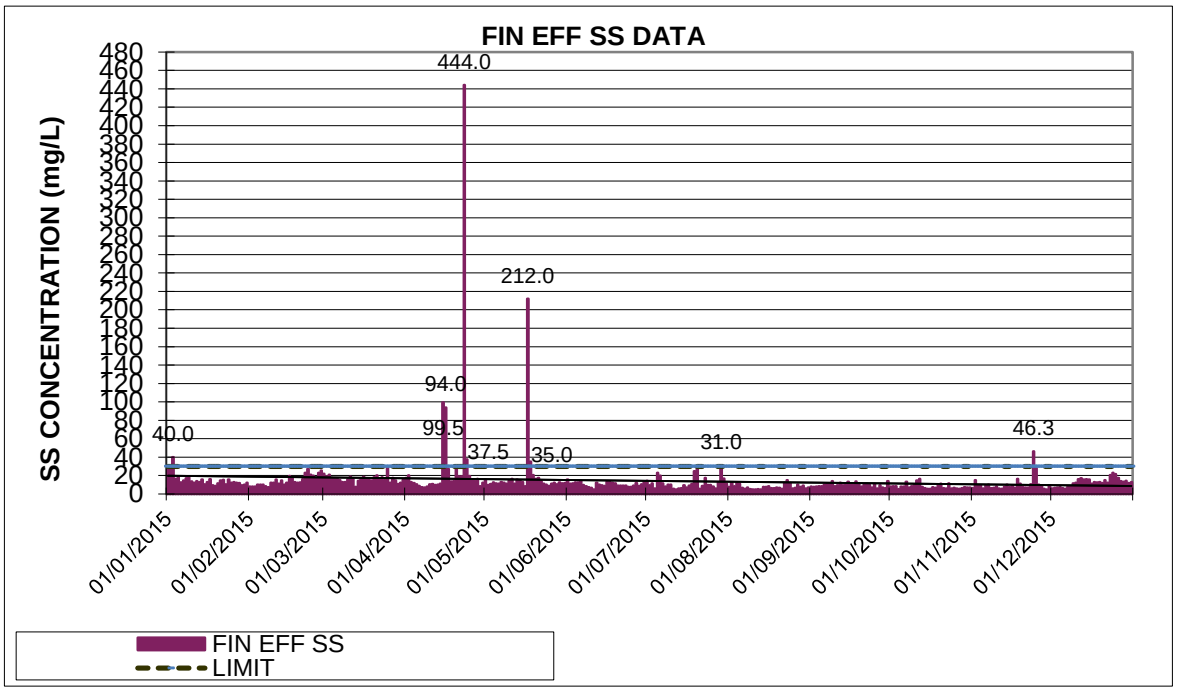




COLIFORM YEAR TO DATE ANALYSIS

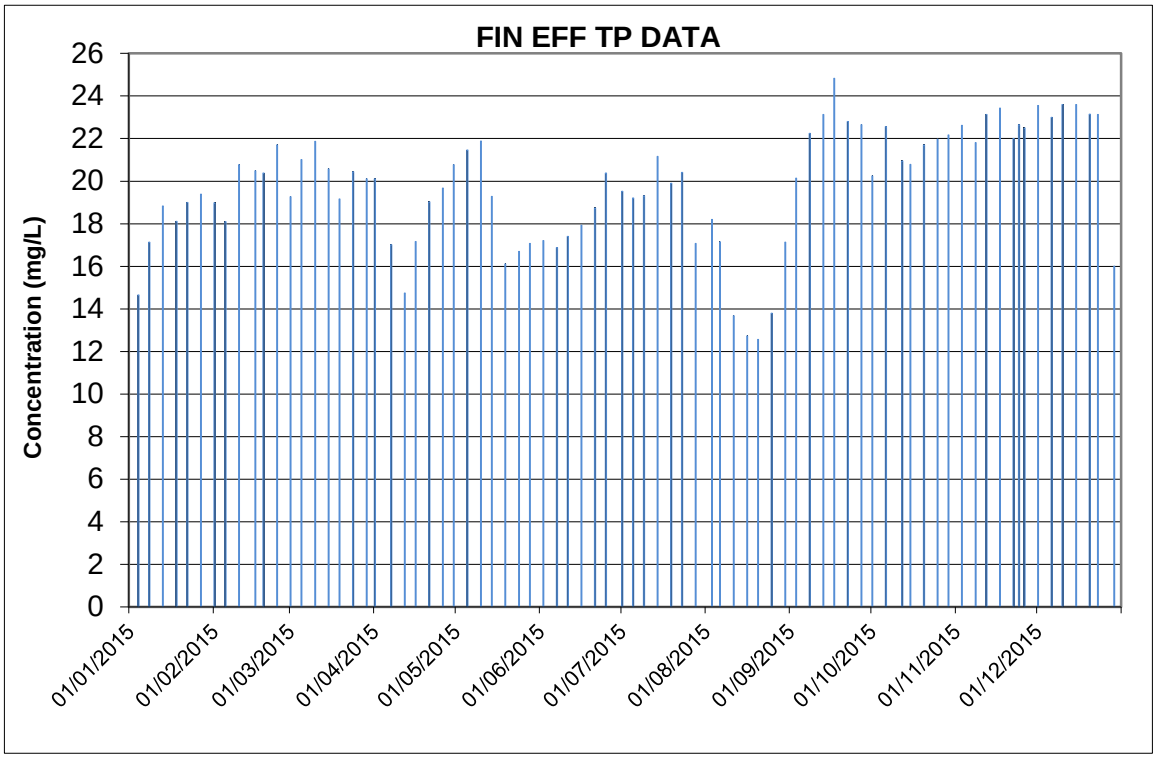
FECAL COLIFORM ANALYSIS (FEC)		TOTAL COLIFORM ANALYSIS (TOT)	
TOTAL ANALYZED	156	TOTAL ANALYZED	156
GEOMEANS	7.3	GEOMEANS	9.1

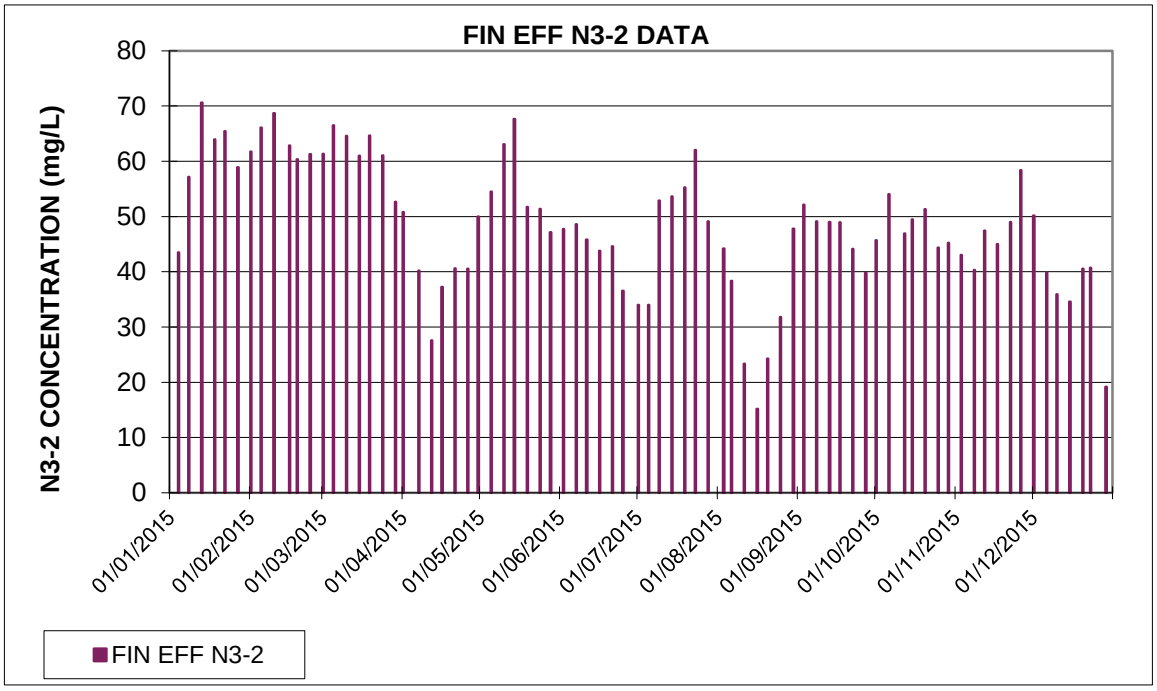




YEAR TO DATE ANALYSIS RESULTS

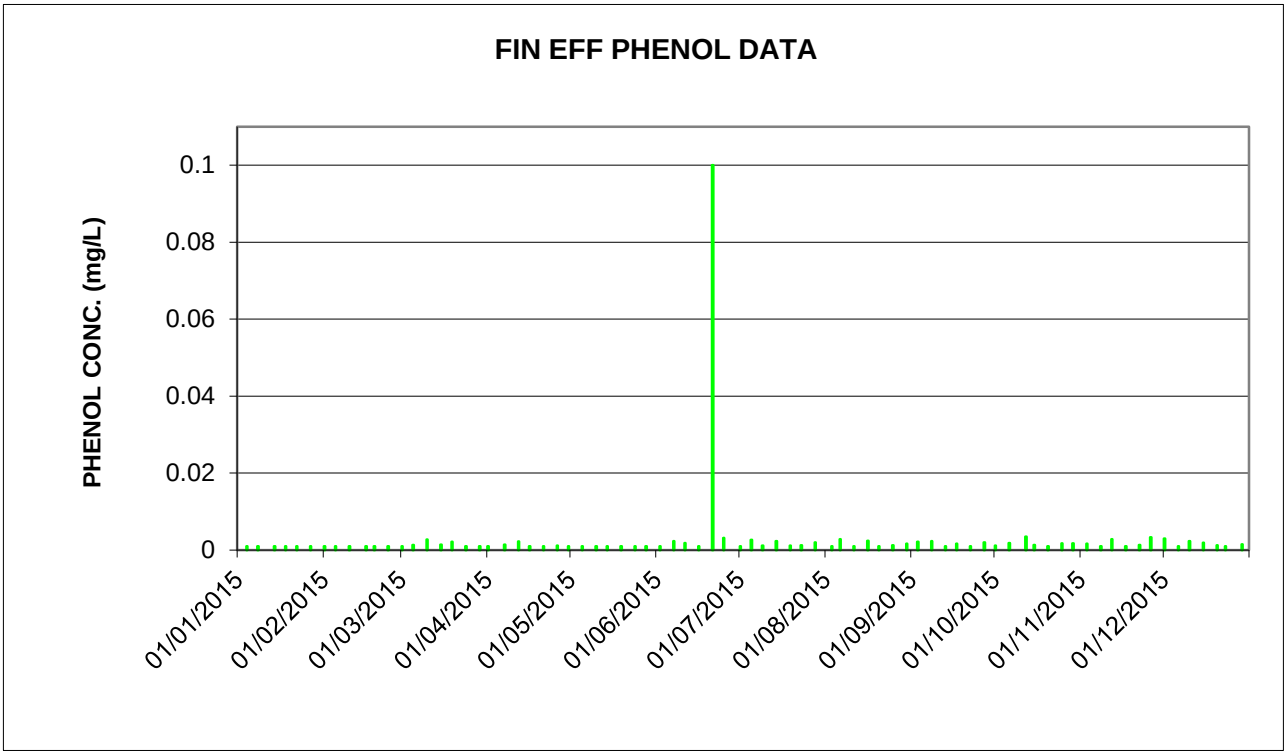
FIN EFFBOD DATA		**SS ANALYSIS**	
TOT. #FAILURES	1	TOT. #FAILURES	9
TOT. SAMPLES ANALYZED	131	TOT. SAMPS ANALYZED	365
PERCENT FAILURE	0.76%	PERCENT FAILURE	2.47%

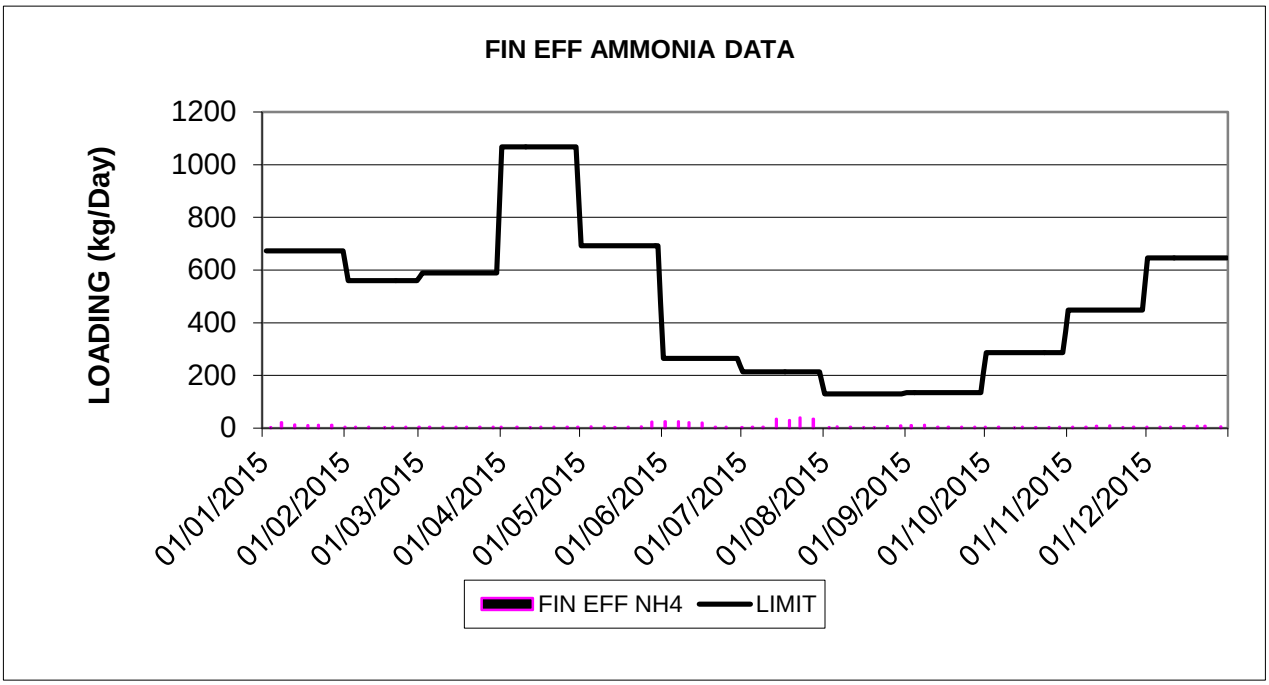




YEAR TO DATE ANALYSIS RESULTS

TP DATA		**N3-2 ANALYSIS**	
TOT. #FAILURES	0	TOT. #FAILURES	0
TOT. SAMPLES ANALYZED	79	TOT. SAMPS ANALYZED	78

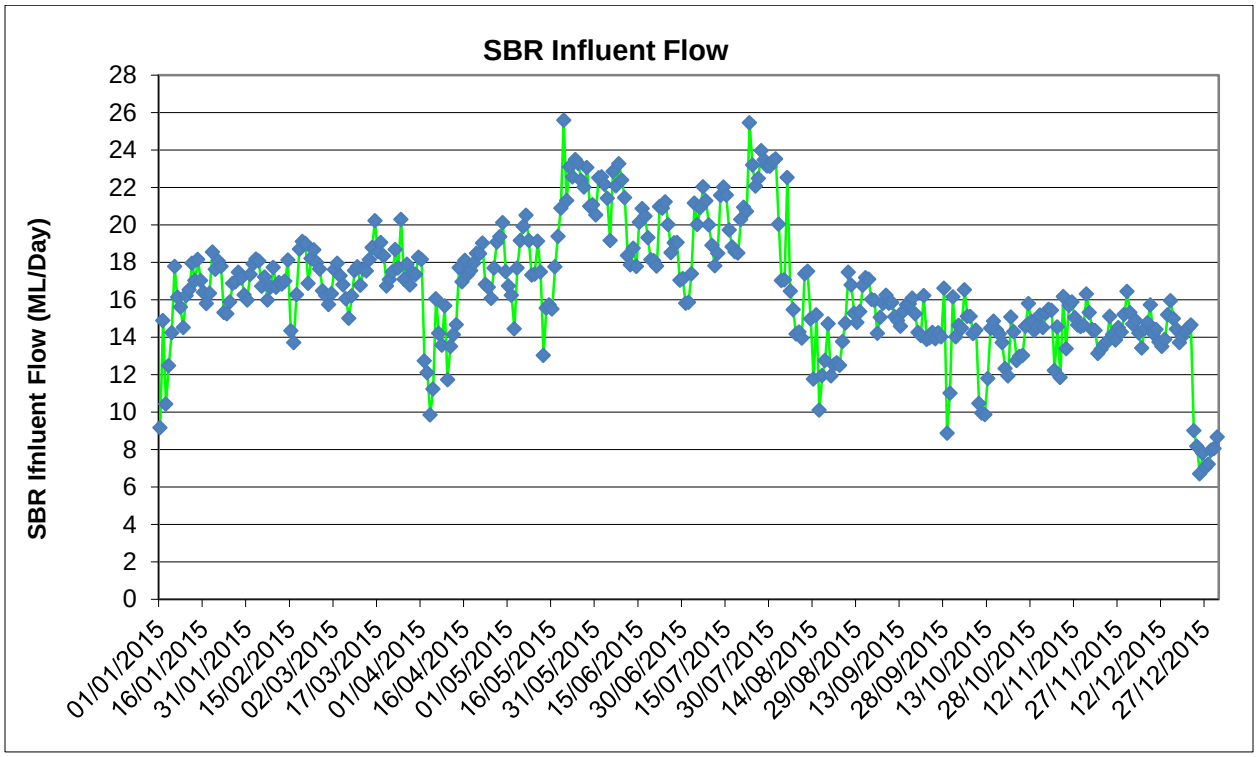




YEAR TO DATE ANALYSIS RESULTS

PHENOL ANALYSIS	
TOT. #FAILURES	0
TOT. SAMPS ANALYZED	78

AMMONIA ANALYSIS	
TOT. #FAILURES	0
TOT. SAMPS ANALYZED	78
PERCENT FAILURE	0.00%


SBR Influent Flow
SBR Ifnluent Flow (ML/Day)
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
01/01/2015
16/01/2015
31/01/2015
15/02/2015
02/03/2015
17/03/2015
01/04/2015
16/04/2015
01/05/2015
16/05/2015
31/05/2015
15/06/2015
30/06/2015
15/07/2015
30/07/2015
14/08/2015
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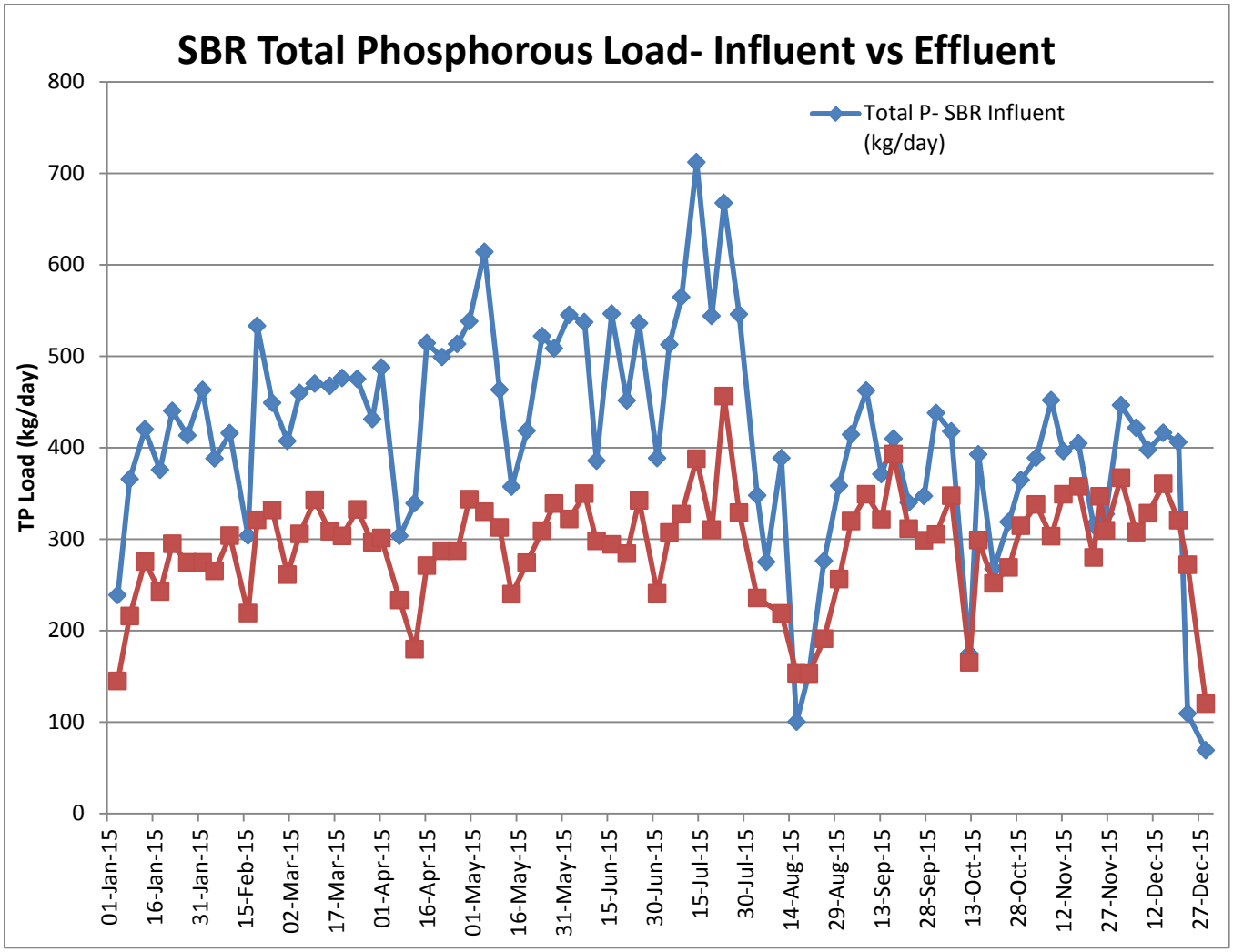
12/11/2015
27/11/2015
12/12/2015
27/12/2015


SBR Total Phosphorous Load- Influent vs Effluent
TP Load (kg/day)
Total P- SBR Influent (kg/day)
800
700
600
500
400
300
200
100
0
01-Jan-15
16-Jan-15
31-Jan-15
15-Feb-15
02-Mar-15
17-Mar-15
01-Apr-15
16-Apr-15
01-May-15
16-May-15
31-May-15
15-Jun-15
30-Jun-15
15-Jul-15
30-Jul-15
14-Aug-15
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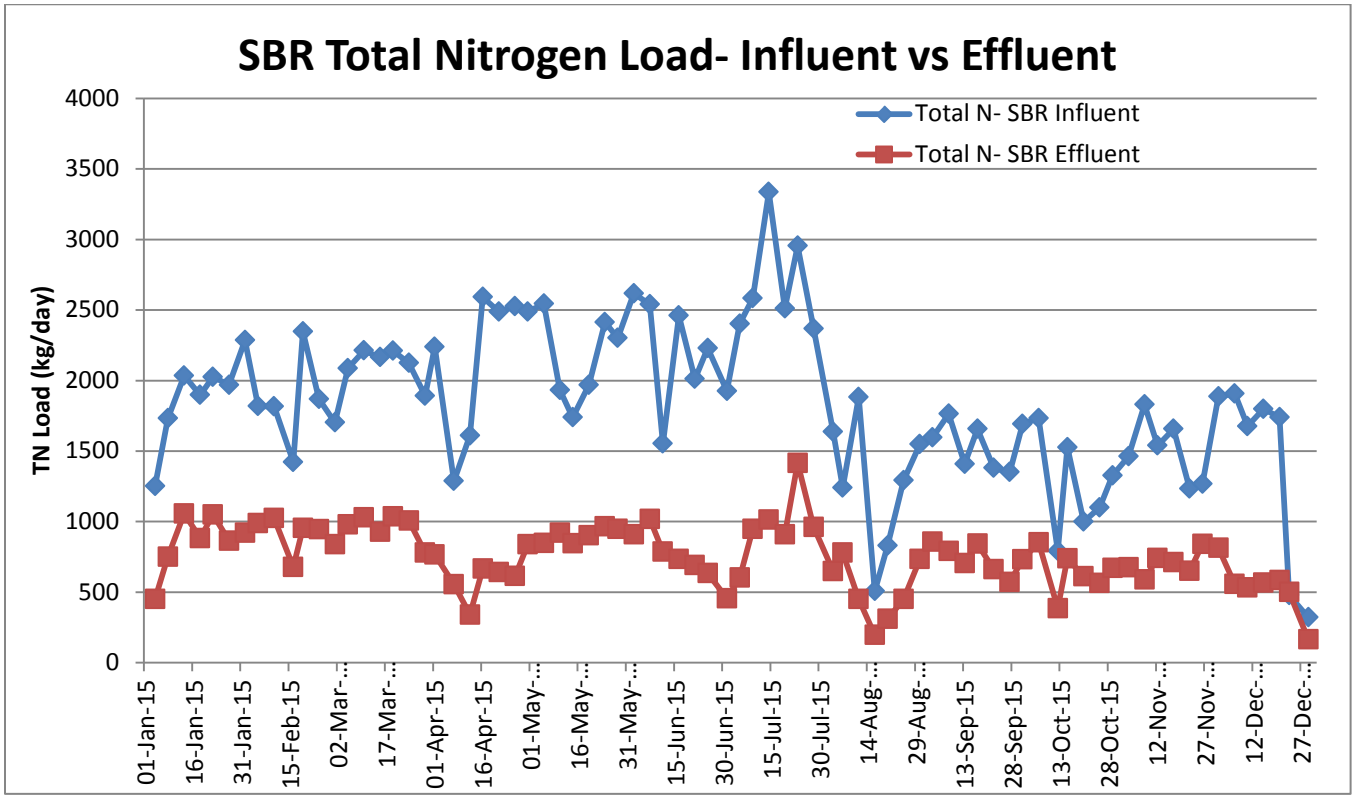
27-Nov-15
12-Dec-15
27-Dec-15


SBR Total Nitrogen Load- Influent vs Effluent
TN Load (kg/day)
Total N- SBR Influent
Total N- SBR Effluent
4000
3500
3000
2500
2000
1500
1000
500
0
01-Jan-15
16-Jan-15
31-Jan-15
15-Feb-15
02-Mar-...
17-Mar-...
01-Apr-15
16-Apr-15
01-May-...
16-May-...
31-May-...
15-Jun-15
30-Jun-15
15-Jul-15
30-Jul-15
14-Aug-...
29-Aug-...
13-Sep-15
28-Sep-15
13-Oct-15
28-Oct-15
12-Nov-...
27-Nov-...
12-Dec-...
27-Dec-...

Reporting

Monthly reports are submitted to Manitoba Conservation providing the influent data from the various sources as well as the final effluent information. A copy of relevant information is also sent to each industry each month.

On a quarterly basis, WPCF is required to report to the Federal Government under the Water Systems Effluent Regulation. It was determined late in 2015, that all data reported under this regulation must be produced from an accredited lab. The Province of Manitoba recognizes the work of the WPCF lab technologists as equivalent but the federal government does not. These samples must be sent to an external lab for analysis. The Provincial government is working toward a reciprocity agreement with the federal government to reduce the amount of reporting that facilities must conduct. Under this agreement, all data that WPCF reports as part of the operating license will need to be analyzed by a certified lab.

A National Pollutant Control report is also submitted annually. WPCF must report on ammonia and total phosphorous.

Lift Stations

The City of Portage la Prairie operates and maintains twelve pumping stations throughout the city. These stations collect and pump wastewater to the treatment facility. No significant concerns- power outages due to storms.

Biosolids Land Application

Biosolids are the residual solids that accumulate throughout the treatment process. At WPCF, these solids are dewatered and then stored until they can be applied to agricultural land as a fertilizer. Samples of the biosolids material as well from the application field are taken to obtain background levels of metals and nutrients. Application rates are determined based on these results.

The application process occurs twice per year. In the spring, 212.66 dry tonnes of biosolids was applied and an additional 751.76 dry tonnes was applied in the fall. A total of 964.42 dry tonnes was applied for 2015. A year-end report was submitted to Manitoba Conservation as required, outlining the total tonnage applied. The report also includes the total amount of ammonia, phosphorous, and metals applied. The owner of the field receives a report and a copy has been posted on the City of Portage la Prairie website.

Facilities Classifications and Operator Certification Levels

The Province of Manitoba requires operators and lift station maintenance staff to be certified according to the classification of the facility. Certification is obtained through experience, examination and continuing education credits. The Water Pollution Control Facility is deemed class 4. The operations foreman and two of the four Operators are unconditionally certified at level four and two operators are unconditionally certified at level three.

The Wastewater Collections system is deemed class 2. The Facility Maintenance foreman is certified at level 2. One lift station maintenance staff is certified at level 1 in collections and distribution and the second maintenance staff is working towards writing the level one exam. The goal is to have all Operators certified to the level of the facilities they operate.

Nutrient Removal Regulation Compliance

The Province of Manitoba implemented the Water Quality Standards, Objectives and Guidelines regulation that requires any wastewater facility that discharges into Lake Winnipeg to reduce nitrogen and phosphorous (nutrients) from the effluent by January 1, 2016; however, a request for a one year extension was made and granted until January 1, 2018. Quarterly reports are provided to Manitoba Conservation as to the progress of this project.

In 2015, the preliminary design and functional design report were completed and submitted to City Council for acceptance. The total capital cost is estimated at $106 M. As part of funding application, it was necessary to conduct a business case analysis to determine if a Private-Public Partnership would be most economical to help fund this project. Ernst & Young were hired to conduct the review and the report is due in the first quarter of 2016.

Administration continues to work on the Industrial Services Agreements. Extensive alterations to the cost participation formula, including capital and operating costs are ongoing. Several discussions have taken place with the three industrial users to keep them informed on progress on this project and estimates of capital contribution.

Staff Development

Operators and maintenance staff received a variety of training in 2015. This included Confined space refresher, GHS/ WHMIS, first aid renewal (as required).

Lab techs and operations staff continues to take a variety of workshops and correspondence courses relating to wastewater treatment.

Capital Expenditures

The Wastewater facility had approved capital funding for several items. At the facility, a new SBR basin pump was installed. A new pressure washer was purchased as well as a water distiller for the lab. An automation audit was conducted to give comprehensive feedback on the current state of the automation systems as well as recommendations for future upgrades.

The roof of the main office area was replaced using spray foam. This allowed for the repair and replacement of drywall in the control room and men’s washroom. Other water damage had occurred in the lab and as work progressed, mould and further water damage was found. A full remediation was conducted. Repairs have been completed.

Two chopper pumps were purchased to be placed in the digester to provide temporary mixing until a new digester is built with expansion. These will arrive in the first quarter of 2016 and will be installed as soon as possible.

The new SBR lift station was operational for the year and the warranty period ended in September 2015. Several warranty items were identified such as the Kellum grips and a binding gate valve. These items were repaired. There is also a concern of the liner system leaking. The original installer has been kept informed and action on this will take place in early 2016. The top coating of the surface of the station is peeling off in several areas but will be replaced in the spring of 2016.

A 30-hp pump was purchased for the lift stations and the siding was replaced at Yellowquill lift station.