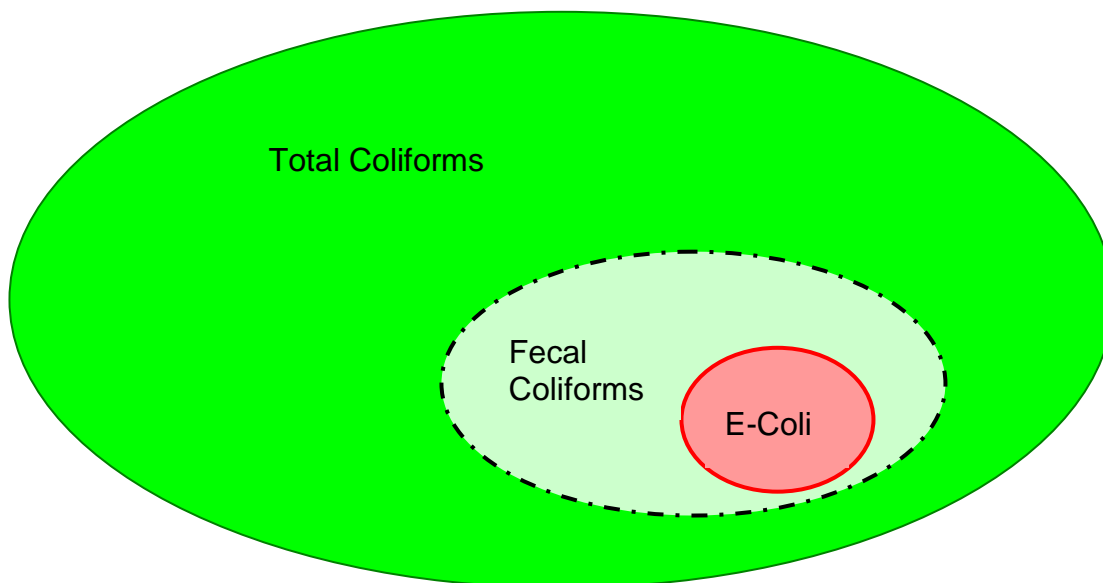


Water testing was sponsored by the RM of Alexander (a grant of \$1945.60), Manitoba Sustainable Development and your association.

Cathy & Wayne Stewart completed 4 sets of water samples between June & September, 2016. The first 3 sets included 4 sample points- ranging from the east end of the river, just before it narrows, after the bridge just past the discharge of Beaver creek, at the western end of the river near the tractor and in the bay that discharges from the Tall Timber lodge area before the Bird River discharges into the lake. 4 sample points were selected to determine if there was a difference in water quality from the start of the cottage area to the end of the river. Due to budget constraints the last set included only 2 sample points- after the bridge at the discharge of beaver creek and in the bay before the river discharges into the lake.

The objective of the water sampling was to assess the water quality of the Bird River for recreational use which was not done in previous sampling campaigns.

- Coliforms are a group of bacteria commonly found in the environment- soil, vegetation and intestines of mammals, including humans. Total coliform and Escherichia coli- or E-coli are used as indicators to measure the degree of pollution and sanitary quality of water- mainly because testing for all known pathogens is complicated and expensive.
- The main sources of pathogens are:
 - Improperly treated septic and sewage discharges
 - Leaching of animal manure
 - Runoff from agriculture
 - Domestic animals and wildlife.



Note that all water drawn from the river MUST be treated for suitability as *drinking water* and it is up to the homeowner to test the water quality to ensure it is suitable for consumption. Drinking water must have **NO coliforms** to be safe to consume. E-Coli in drinking water indicates that the water has been contaminated with fecal material. Health exposures to disease causing bacteria, viruses and parasites can cause nausea, vomiting and diarrhea. Infants, the elderly and those with

compromised immune systems may suffer more severe effects. You should not assume your water is safe to drink just because it has not made you sick in the past. If bacteria are present, there is a chance it will make you ill.

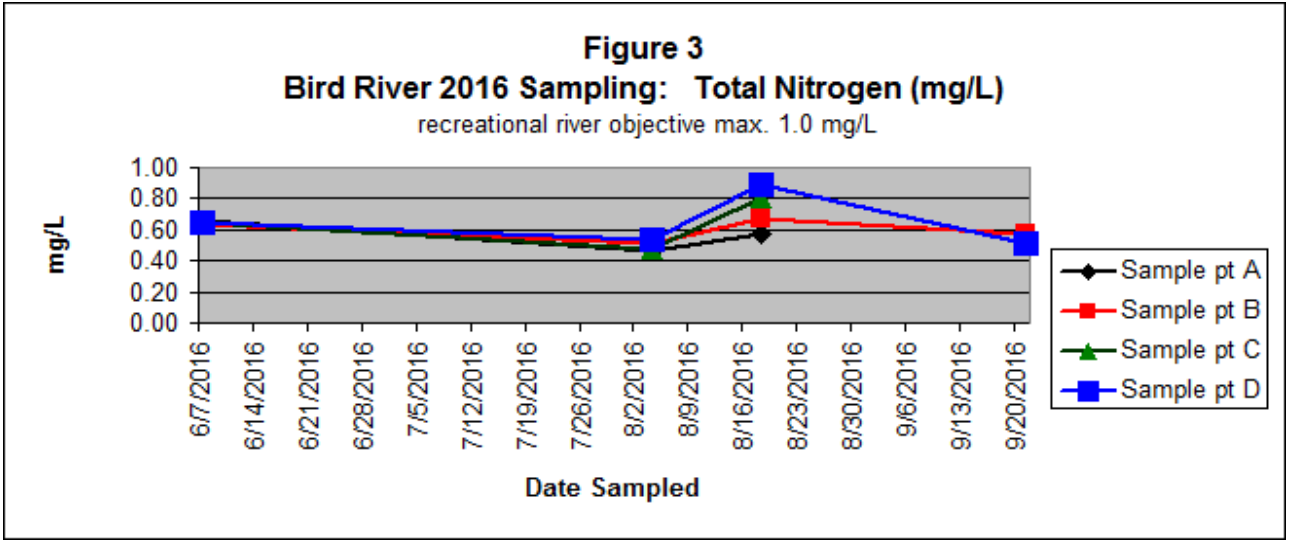
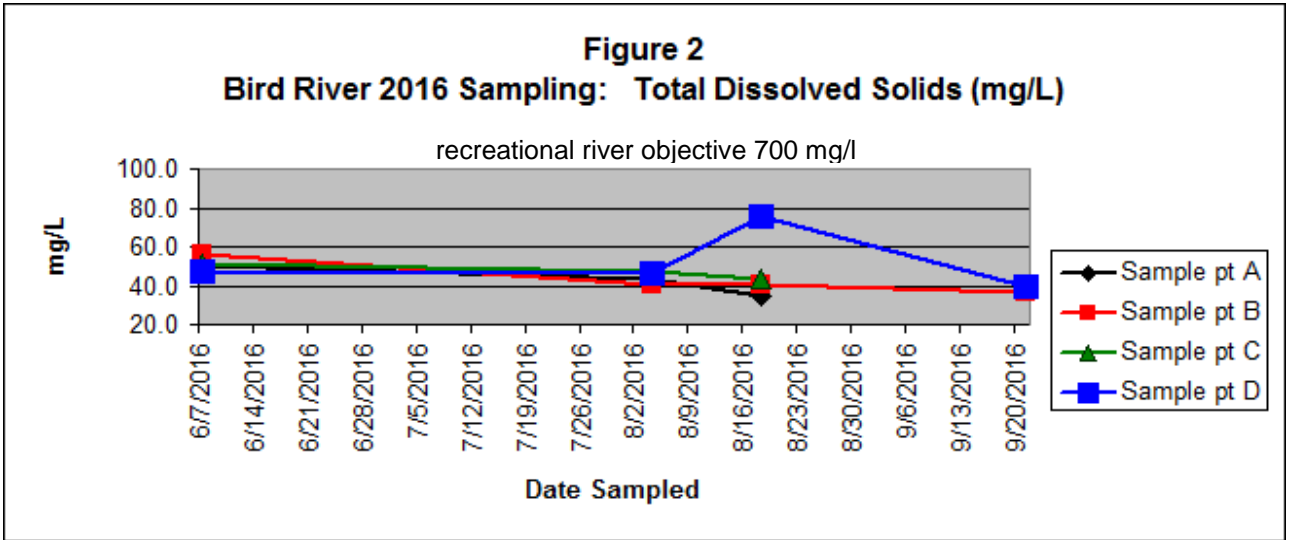
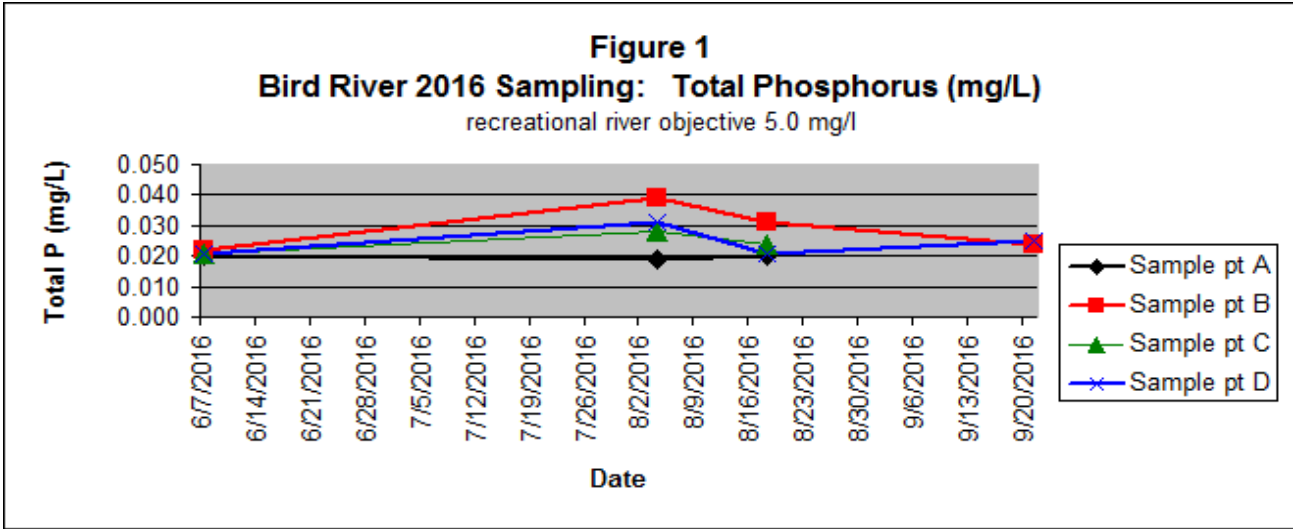
For recreational waters used for primary contact activities such as boating, swimming and fishing the government of Canada recommends e-coli levels of:

<u>Canadian</u>	<u>US EPA</u>
Geometric mean conc. \leq 200 MPN/100ml	(126 MPN/100ml)
Single sample maximum of \leq 400 ecoli/100 ml	(235 MPN/100 ml)

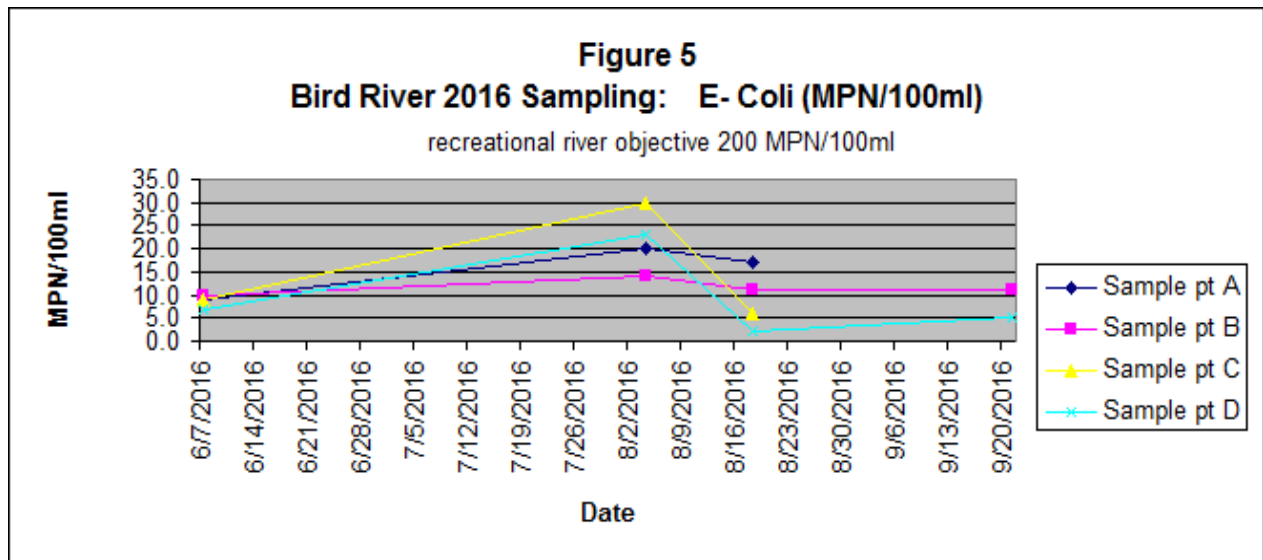
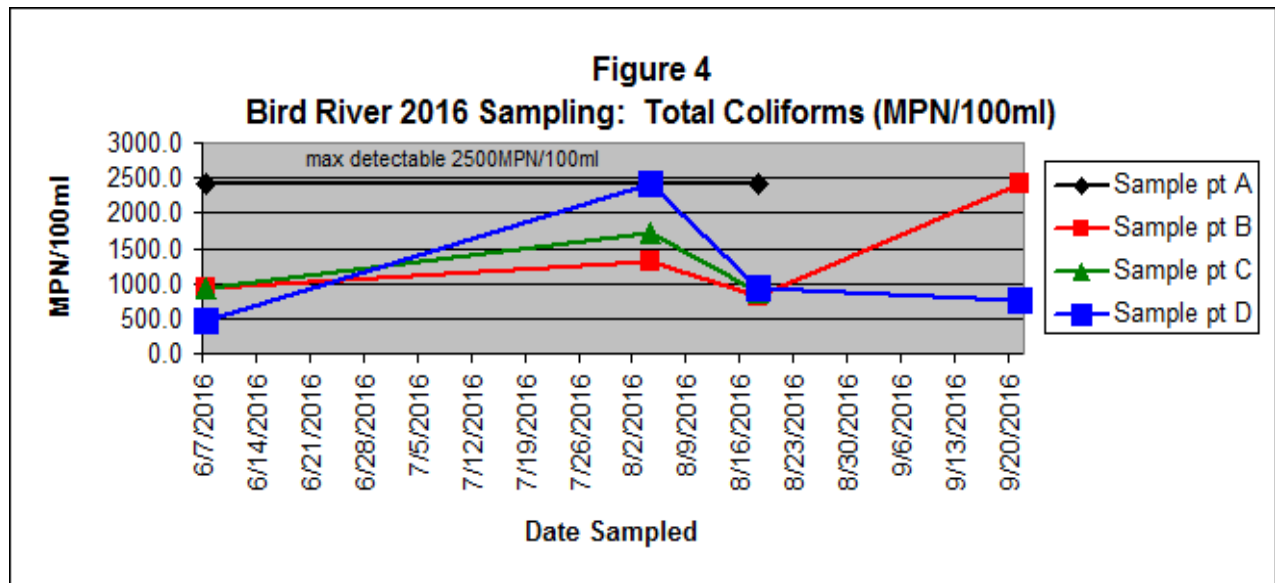
These are based on levels where their presence DOES NOT cause gastro-intestinal illness in swimmers.

A review of the sampling for 2016 shows the following:

- The chemical substances monitored included Phosphorus, Nitrogen, Total Dissolved Solids and Total Suspended solids. (see Figures 1,2,3)
 - a. Results were below the recommended values for recreational river quality and comparable to the results of the 2012 sample program.
 - b. The samples taken on August 16 did show higher levels of nitrogen in the samples at the west end of the river- they were at 0.8 and 0.89 mg/L respectively (compared to recommended maximum level of 1 mg/L). Higher nitrogen levels can promote algal blooms and nuisance growth of aquatic plants. Sources can be fertilizers used on lawns and running off into the water. (Note that an algae bloom was reported in this area around the August long weekend).
- Total coliforms were at the maximum detection level at the eastern sample point where the maximum inflow is likely bringing vegetation debris and silt from the narrower part of the river into the area around the sample point. Dissolved solids were also somewhat higher in this sample. Note that there is no recreational water standard for total coliforms - this is simply an indicator of vegetation and wildlife along the river.
- E-Coli measurements were **well below** the recommended Canadian recreational water quality objective of 200 MPN/100ml. However, there was a peak just after the August long weekend- the Aug 4 samples had the highest levels, again at the 2 western most sample points- likely an indication of increased human usage.
- It is recommended that the BRCOA continues with routine monitoring of river water quality on a regular basis (approx. every 3-4 years), unless conditions change on the river- such as increased cottage density, changes to the Tanco effluent discharges or changes to the user profile such as expansion of Bible camp or Tall Timber Lodge facilities.



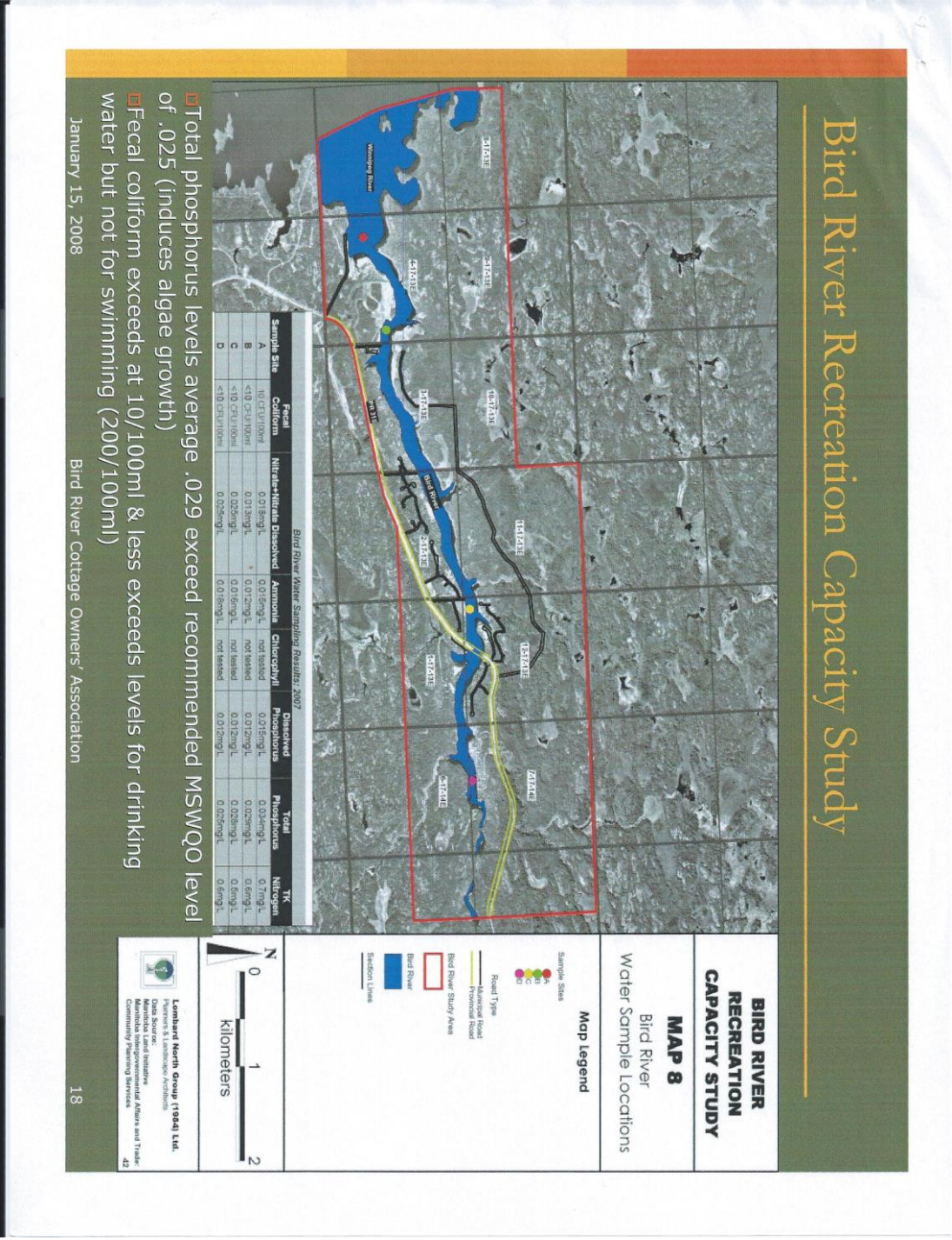
Flow is from Sample point A to Sample point D (east to west) with locations as follows:
 A: East end near rapids
 B: just past the discharge of Beaver Creek into the river
 C: west end near tractor
 D: west end near discharge to Lac du Bonnet (Tall Timber inlet)



Flow is from Sample point A to Sample point D (east to west) with locations as follows:

- A: East end near rapids
- B: just past the discharge of Beaver Creek into the river
- C: west end near tractor
- D: west end near discharge to Lac du Bonnet (Tall Timber inlet)

Figure 6 Bird River Sample Locations



- ☐ Total phosphorus levels average .029 exceed recommended MSWQO level of .025 (induces algae growth)
- ☐ Fecal coliform exceeds at 10/100ml & less exceeds levels for drinking water but not for swimming (200/100ml)

January 15, 2008

Bird River Cottage Owners' Association

Table 1 Sampling Data (nd= not detectable)

Total Phosphorus (mg/L)					
Date	Sample pt A	Sample pt B	Sample pt C	Sample pt D	Avg
7-Jun	0.020	0.022	0.021	0.021	0.021
4-Aug	0.019	0.039	0.028	0.031	0.029
18-Aug	0.020	0.031	0.024	0.021	0.024
21-Sep		0.024		0.025	

Flow is from Sample point A to Sample point D (east to west) with locations as follows:
A: East end near rapids
B: just past the discharge of Beaver Creek into the river
C: west end near tractor
D: west end near discharge to Lac du Bonnet (Tall Timber inlet)

Total Dissolved Solids (mg/L)					
Date	Sample pt A	Sample pt B	Sample pt C	Sample pt D	Avg
7-Jun	50.0	56.0	51.0	47.0	51.0
4-Aug	43.3	40.6	46.9	46.2	44.3
18-Aug	34.3	40.8	43.1	76.0	48.6
21-Sep		37.0		39.1	

Total Suspended Solids (mg/L)					
Date	Sample pt A	Sample pt B	Sample pt C	Sample pt D	Avg
7-Jun	6.0	nd	nd	5.0	2.8
4-Aug	nd	nd	6.0	9.0	3.8
18-Aug	nd	nd	5.0	nd	1.3
21-Sep		nd		5.0	

Total Nitrogen (mg/L)					
Date	Sample pt A	Sample pt B	Sample pt C	Sample pt D	Avg
7-Jun	0.66	0.64	0.65	0.65	0.65
4-Aug	0.46	0.51	0.48	0.54	0.50
18-Aug	0.57	0.67	0.80	0.89	0.73
21-Sep		0.57		0.51	

Total Coliforms (MPN/100ml)					
Date	Sample pt A	Sample pt B	Sample pt C	Sample pt D	Avg
7-Jun	2420.0	921.0	921.0	461.0	1180.8
4-Aug	2420.0	1300.0	1730.0	2420.0	1967.5
18-Aug	2420.0	816.0	866.0	921.0	1255.8
21-Sep		2420.0		770.0	

Escherichia Coli (MPN/100ml)					
Date	Sample pt A	Sample pt B	Sample pt C	Sample pt D	Avg
7-Jun	9.0	10.0	9.0	7.0	8.8
4-Aug	20.0	14.0	30.0	23.0	21.8
18-Aug	17.0	11.0	6.0	2.0	9.0
21-Sep		11.0		5.0	