

# ***WHITEMOUTH RIVER WATER QUALITY TESTING 2001 - 2006***

## **EXECUTIVE SUMMARY**

The Whitemouth River runs through an agricultural area that has a large amount of livestock and field crop production (Appendix 4). Considerable livestock production in the area means there is significant manure to put on the land. The most productive land is adjacent to the river and it drains naturally towards the river. Cattle are also pastured and watered close to the river. There was a desire to determine if agricultural production and residential development were having a negative impact on the quality of the river water. Sampling projects were undertaken to sample the river. The tests were considered adequate to measure any impact of agricultural and residential activity, and to provide an indication of suitability of the river for aquatic biota including fish. Those results indicate that the river has very good water quality.

## **DATA SOURCES AND SAMPLING**

The Whitemouth-Reynolds Soil and Water Conservation Association began sampling water quality in the Whitemouth River April 24, 2001 and continued this program through 2006. Four sites were monitored in 2001. A site on Kellner Creek, which flows into the Whitemouth, was added in 2002, and a fifth site on the Whitemouth at PR 408, downstream from Whitemouth, was added in 2003

Whitemouth River sites were sampled 13 times in 2001 and 13 times in 2002. The sampling frequency was reduced to 11 times in 2003 and to nine times in 2004. All sites on the river were sampled 7 times in 2005 and in 2006. Kellner Creek is an intermittent stream. It was sampled, if flowing, on the same dates as the river sites.

**The site south of Highway #1** is located on PR 503 a few kilometers upstream of Hadashville. Samples taken at this site measure water quality at a point upstream of most residential development and almost all agricultural development. The Whitemouth River originates at Whitemouth Lake approximately 18 miles from of the US border and flows north through an area of bog and forest between the Lake and the sampling site.

**The PR 506 site** is located at a bridge crossing the river about halfway between Hadashville and Elma at a point upstream of the confluence of the Whitemouth and the Birch Rivers. Samples taken here reflect any changes in quality deriving from activities, including agriculture, in the Hadashville – Medika district.

**Kellner Creek** is monitored separately from the Whitemouth River at a point where it crosses the old road from Elma to Whitemouth (PR 406). Kellner Creek is an intermittent creek which rises south of Highway 15 a few kilometers west of Elma. Kellner Creek flows through an agricultural area and joins the Whitemouth a few kilometers upstream of the Highway 44 sampling site. The stream is intermittent and samples are not always available. Kellner Creek is monitored because it yields concentration levels which are often above those in the mainstem of the Whitemouth.

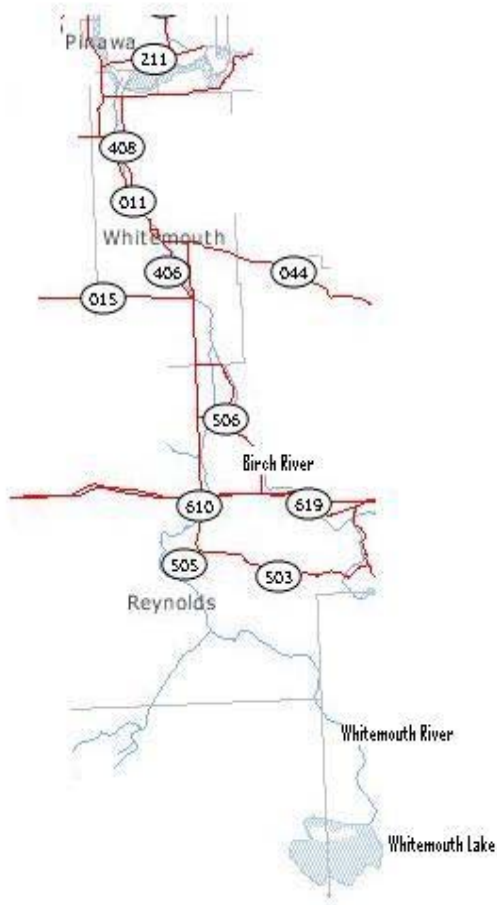
**The Highway 44 site** is located at the point where the river is crossed by Highway # 44 a few kilometers east, i.e., upstream, of the village of Whitemouth. Between the PR 506 site and the HWY 44 site the Whitemouth River is joined by the Birch River, which originates a short distance south and west of Falcon Lake and which

drains more than 25% of the Whitemouth River watershed. Samples taken at this station therefore reflect changes in water quality caused by activities and land uses in the entire Birch River watershed and in the Elma district, including the Kellner Creek watershed. The Birch River is not monitored separately because a comparison of nutrient concentrations indicate that levels in the Birch are somewhat lower than those found in the Whitemouth.

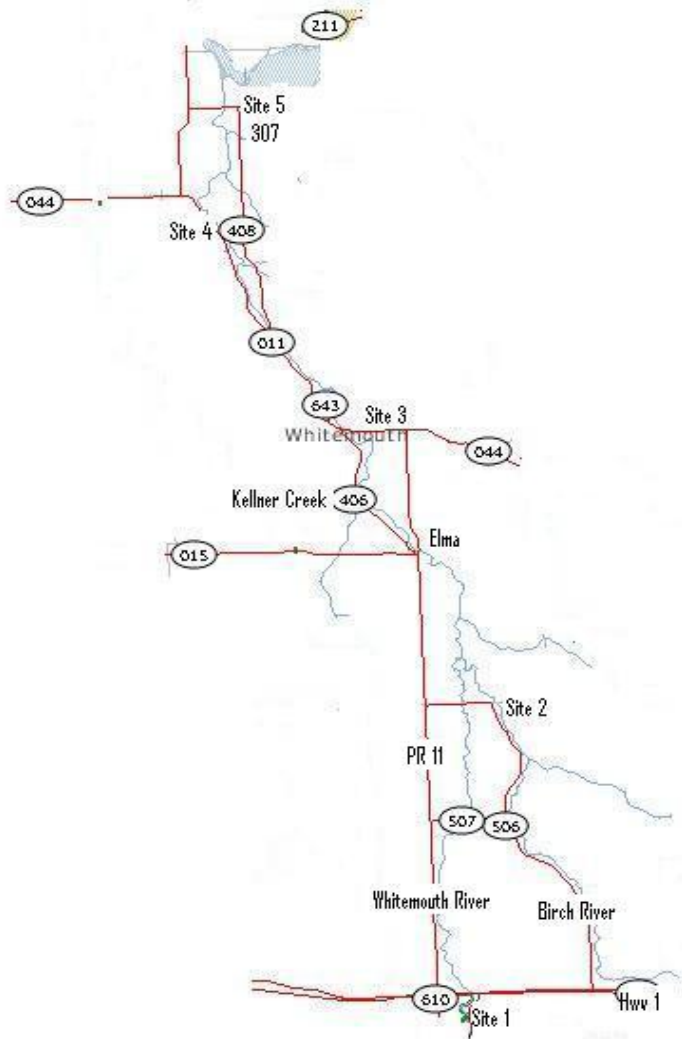
**The PR 408 site** is located west of the village of Whitemouth and south of River Hills. Samples taken at this site reflect any changes in water quality deriving from activities in the Whitemouth district.

**The Seven Sisters site** is located close to the point where the Whitemouth River joins the Winnipeg River. Samples taken at this site measure water quality at the point of discharge and reflect any changes in quality caused by activity in the fairly large agricultural district downstream of the PR 408 site.

# Whitemouth River Watershed



## Sampling Locations 2005 and 2006



### Sampling Location Legend

- Site 1 South of Hwy 1 at campground
- Site 2 Bridge on PR 506
- Kellner Creek Site
- Site 3 Hwy 44 at Whitemouth
- Site 4 PR 408
- Site 5 PR 307 in Seven Sisters

# **WHITEMOUTH RIVER WATER QUALITY TESTING**

## **OVERVIEW**

In 2005, standard sample sets were taken at five sites on seven occasions between May 5<sup>th</sup> and October 3<sup>rd</sup>. Kellner Creek was sampled on four occasions. In 2006, seven sample sets were taken at five sites between April 24<sup>th</sup> and October 2<sup>nd</sup>, and Kellner Creek was sampled 3 times.

No major changes in the key indicators of water quality were noted in either 2005 or 2006 compared to the previous 4 years. Precipitation was heavy and stream flows were high in 2005. During the year, mean nitrogen levels were below the six-year mean levels at all six sampling stations. Stream flows were generally much lower in 2006, and nutrient levels were higher than in 2005. Both nitrogen and phosphorus levels were very close to the six year mean at all stations, and were lower than those measured a few years earlier.

During the six year period 2001-2006 both nitrogen and phosphorus levels have fluctuated within a narrow range with no apparent trend upward or downward over time. It is also noteworthy that nutrient levels at the downstream site at Seven Sisters remain slightly lower than levels upstream. Nutrient levels do not increase as the river flows through portions of the watershed occupied by residences, farms, and small urban centers.

Measurements of *E.coli* remained low during the two year period. Mean levels at some sampling points were slightly above or slightly below the six-year mean, but no major trends were observed.

**TABLE 1  
WHITEMOUTH RIVER WATER QUALITY SUMMARY  
2005 & 2006**

	<b>HWY #1 (Site 1)</b>	<b>PR 506 (Site 2)</b>	<b>HWY #44 (Site 3)</b>	<b>PR 408 (Site 4)</b>	<b>7 SISTERS (Site 5)</b>	<b>KELLNER Creek</b>
<b>NITROGEN 05-06 (ppm)</b>	0.7038	0.7237	0.7163	0.7163	0.527	0.9439
<b>NITROGEN 06-07 (ppm)</b>	1.0794	1.0061	0.9501	0.95	0.8933	1.1149
<b>LONG-TERM MEAN (ppm)</b>	0.9229	1.006	0.907	0.874	0.87	1.121
<b>PHOSPHORUS 05-06 (ppm)</b>	0.0286	0.0304	0.0393	0.0324	0.0332	0.0286
<b>PHOSPHORUS 06-07 (ppm)</b>	0.0415	0.0398	0.0321	0.0375	0.0539	0.069
<b>LONG-TERM MEAN (ppm)</b>	0.041	0.044	0.042	0.038	0.039	0.065
<b><i>E.coli</i> 05-06</b>	14	19	60	63	67	57
<b><i>E.coli</i> 06-07</b>	61	19	55	162	59	71
<b><i>E.coli</i> - Long-term mean</b>	32	36	41	81	63	78

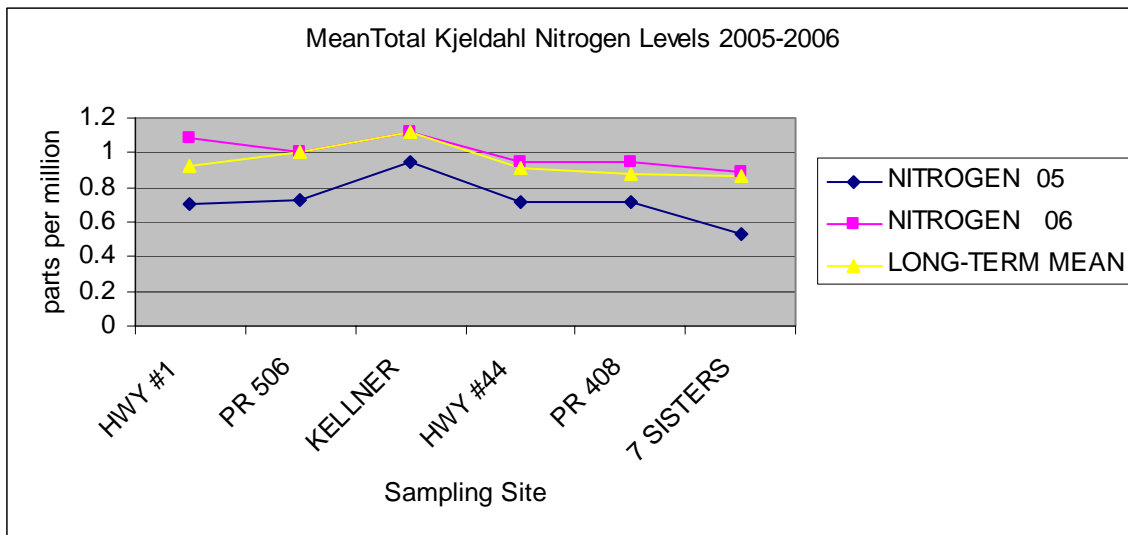
### **Nitrogen**

Mean nitrogen levels, measured as total Kjeldahl nitrogen, have fluctuated over the six-year period at slightly below 1 part per million (ppm). During this period levels at the sampling station near the mouth of the Winnipeg River were lowest at about .87 ppm compared to about .93 at the upstream monitoring station, south of Highway # 1. The mean level increased slightly as the river flowed through the Hadashville reach to the PR 506 sampling station, where the six-year level was about 1.01 ppm. Intermittent flows on Kellner Creek yielded

the highest mean level of nitrogen of 1.121 ppm. Progressively lower levels were recorded at Highway #44 near Whitemouth, at PR 408, downstream from Whitemouth and at Seven Sisters.

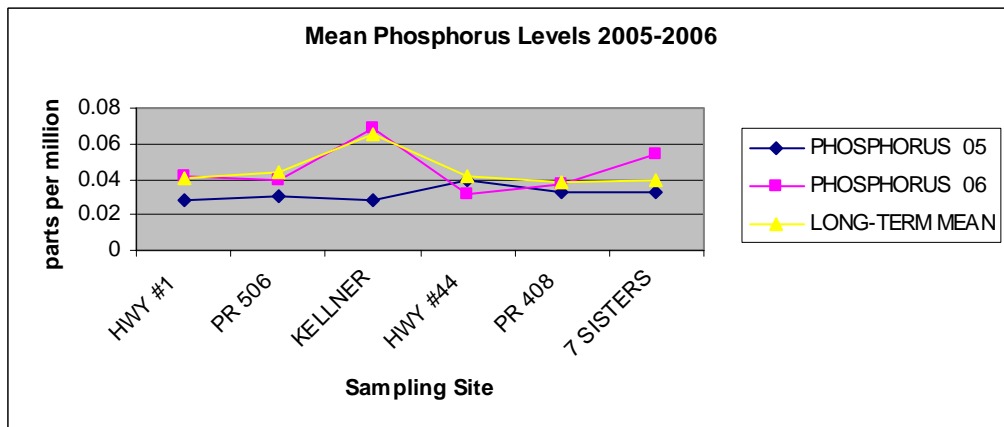
As shown in Figure 1, below, in 2005, total Kjeldahl nitrogen levels in the range of .7 ppm were somewhat below the six year mean at all stations. Levels in 2006 were very close the six-year mean at all sampling stations.

**FIGURE 1**



**Phosphorus**

Figure 2 presents levels of phosphorus concentration at all stations for 2005 and 2006 and the mean levels for the period 2001-2006. Mean levels of concentration of total phosphorus remain constant at about .04 ppm during the six year period at all sampling stations except Kellner Creek. The provincial guideline for P is .05 ppm. Phosphorus levels in 2005, a high water year, were slightly below the six year mean. Levels in 2006 were very close to the six-year mean at all sampling station except Seven Sisters, where levels were slightly above.



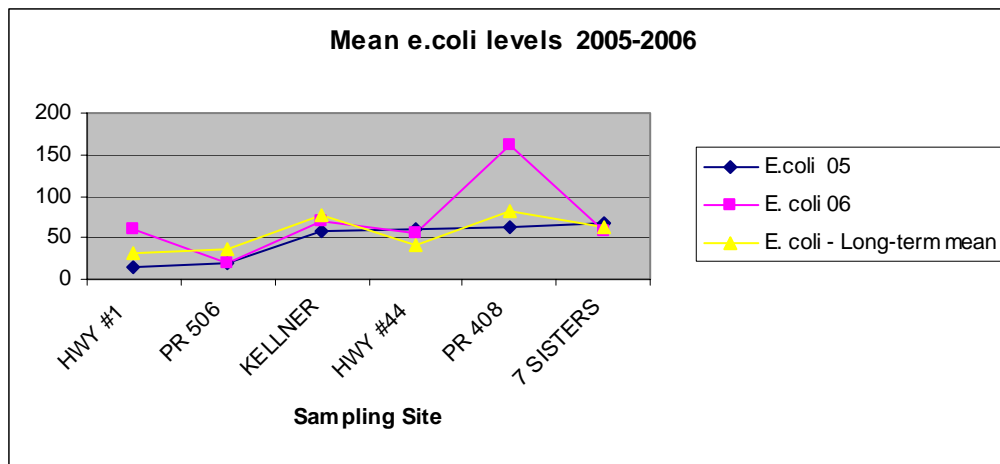
## Bacteria

*E. coli* levels remained very close to the six-year mean at all points on the Whitemouth River in 2005, and levels on Kellner Creek were also at the six-year mean level. As shown in Figure 3 below, the same pattern was observed in 2006. An exception in that year was a slightly elevated level observed at the PR 408 sampling site downstream from the community of Whitemouth.

Throughout the two year period mean *E. coli* levels fluctuated in the range of 30 to 60 CFU/100 ml. A mean level of about 150 CFU/100 ml was recorded at PR 408 in 2006.

During the six-year period, the lowest mean levels have been recorded at the upstream monitoring site, located south of highway #1 and upstream of most residential and agricultural development. Mean levels increase as the river flows through developed areas, rising from 32 to 63. The highest mean level has been recorded at PR 408 (81CFU/100mg.) Levels in Kellner Creek were somewhat higher than those in the mainstem of the Whitemouth, at 78. As a comparison, the provincial guidelines for swimming are 200 CFU/100mg.

**Figure 3**



## OBSERVATIONS AND PERSPECTIVE

A report published by Manitoba conservation in 2002 identified “Enrichment of surface waters with plant nutrients such as phosphorus (P) and nitrogen (N)” as “one of the largest water quality issues facing...Manitoba”. The same report stated,

“Nitrogen and P are essential components of healthy ecosystems and are naturally widespread in the environment. However, virtually all human activities can introduce new sources of nutrients to the aquatic systems, can increase the rate of loss of nutrients from the landscape, or can increase the rate at which nutrients become available to support algal growth.”

The Whitemouth-Reynolds Soil and Water Conservation Association have been monitoring the quality of water in the Whitemouth River watershed since 2001 to determine:

- The levels of nutrients (N and P) and certain bacteria (*E. coli*) in the Whitemouth River.
- Whether these levels change as the river flows from the largely uninhabited upstream reach south of Highway 1, through the agricultural and residential areas downstream to where it empties into the Winnipeg River.
- Whether the nutrient and/or bacteria levels are changing over time.
- Whether there are any points or areas where levels of nutrient or bacteria concentration are significantly above mean levels in the river, or above acceptable levels.

The Association is also concerned with the extent, if any, that the nutrients flowing from this watershed might contribute to excessive nutrient levels and algal growth in Lake Winnipeg.

The levels of nutrients in the Whitemouth River system do not increase as it flows from the bogs and forests of the upstream reaches and passes through the residential and agricultural region downstream. Nitrogen levels at the Seven Sisters sampling site, close to the point where the Whitemouth discharges into the Winnipeg River, are slightly lower than at the site south of Highway 1. Phosphorus levels are more important than nitrogen levels because phosphorus is the key element controlling algal growth. Phosphorus levels remain constant at about .04 ppm/ along the entire course of the river.

Nutrient levels in the river have not changed significantly during the six-year period. Levels at all points were slightly lower than the six-year mean in 2005 and slightly higher than the mean in 2006. The 2006 levels were, however, slightly lower than in some earlier years. Throughout the entire period, and along the entire course of the river, N levels have fluctuated around 1 ppm and P levels have been constant around .04 ppm.

**COMPARISON WITH OTHER MANITOBA WATER BODIES**

It is interesting to compare the nutrient levels in the Whitemouth River to those in other rivers and streams in Manitoba, and to Lake Winnipeg, into which the Whitemouth discharge ultimately flows. Table 2 and Table 3, below, present data drawn from a Manitoba Conservation report and from a recent report by North South Consultants to the Lake Winnipeg Consortium.

**Table 2  
Nitrogen Levels in Selected Manitoba Surface Waters**

<b>Sampling site</b>	<b>Most Recent</b>	<b>Earlier</b>
Red River near Selkirk	approx. 3 in 2000	approx. 2 in 1978
Roseau near Dominion City	approx. 1.5 in 2000	approx. 1 in 1973
Seine River at Winnipeg Floodway	approx. 1.8 in 2000	approx. 1 in 1973
Assiniboine east of Portage la Prairie	approx. 1.5 in 2000	approx. 1.1 in 1970
Brokenhead River near Scanterbury	approx. 1.1 in 2000	approx. 1.1 in 1970
Lake Winnipeg South Basin	.792 in 2005	.475 in 1992
<b>Whitemouth River at Seven Sisters</b>	<b>.87 (mean 2001-2006)</b>	<b>no data prior to 2001</b>

Nitrogen level data have been selected for sampling sites near the mouths of rivers of various sizes in south-eastern Manitoba. Current levels in the Whitemouth are closely comparable to levels in the Brokenhead, and somewhat lower than in the other streams. The levels of concentration of nitrogen measured at all points in the Whitemouth during the past six years are closely comparable to the levels found in other streams about 30 years ago.

Levels of nitrogen concentration in the Whitemouth have remained static while increases have been noted in some other streams. The period of sampling of the Whitemouth is too short, however, for direct comparison of rates of change. Current levels in the south basin of Lake Winnipeg appear to be slightly lower than those measured in the Whitemouth River at Seven Sisters.



**Table 3**  
**Phosphorus Levels in Selected Manitoba Surface Waters**

Sampling site	Most Recent	Earlier
Red River near Selkirk	approx. .3 in 2000	approx. .25 in 1978
Roseau near Dominion City	approx. .09 in 2000	approx. .06 in 1973
Seine River at Winnipeg Floodway	approx. .28 in 2000	approx. .1 in 1973
Assiniboine east of Portage la Prairie	approx. .18 in 2000	approx. .15 in 1970
Brokenhead River near Scantebury	approx. .06 in 2000	approx. .06 in 1973
Lake Winnipeg South Basin	.167 in 2005	.069 in 1992
<b>Whitemouth River at Seven Sisters</b>	.039 (mean 2001-2006) no data prior to 2001	

Phosphorous is the most important cause of excessive algal blooms. The rapid increase in phosphorous levels in Lake Winnipeg has drawn attention to sources of phosphorous flowing into the lake. The 2005 mean level was almost .17 ppm, compared to .07 ppm in 1992.

The concentration of phosphorus found in the Whitemouth during the six-year period is consistently lower than levels found in any of the comparable streams in south-eastern Manitoba during the last 30 years.

The mean level of phosphorus concentration in the Whitemouth was considerably lower than that recorded in some other streams. The level in the Seine, for example, was almost seven times higher, and only the Brokenhead was closely comparable.

Levels of concentration of phosphorus in the Whitemouth have remained static during the six-year sampling period. This period is too short, however, for direct comparison to the other streams, where levels of concentration have risen over time.

The mean level of phosphorous concentration in waters discharged from the Whitemouth River during the six-year period 2001-2006 was less than one quarter of the current mean level in the south basin of Lake Winnipeg. The effect of these discharges has been to reduce the rate of increase, and the level of concentration, of phosphorus in Lake Winnipeg during this period.

### **Matters of Concern**

Levels of both phosphorus and nitrogen in Kellner Creek have usually been somewhat higher than those found in the Whitemouth. Attention might be directed to identifying, and perhaps ameliorating, point sources of animal waste along the course of this intermittent stream.

There is evidence of somewhat higher levels of *E. coli* at the PR 408 sampling site downstream from Whitemouth. The source of this minor anomaly might be worthy of some attention.

*E.coli* levels rise as the river flows north from the forest area. The increase is small, but general and pervasive. Greater public awareness of this situation, and of methods of keeping animal and human waste out of the river, might arrest this trend.

## **ACKNOWLEDGEMENTS**

The Whitemouth-Reynolds Soil and Water Conservation Association gratefully acknowledge the contribution in cash and kind of those who make possible the continued monitoring of the quality of water in the Whitemouth River. The Whitemouth-Reynolds Soil and Water Conservation Association has been the proponent of this project since 2001. Manitoba Agriculture, Food and Rural Initiatives and PFRA have assisted in numerous ways. Financial support has been provided by Covering New Ground (2001-2004), the Rural Municipality of Whitemouth, the Rural Municipality of Reynolds, the Sustainable Development Innovations Fund (2005) and the Water Stewardship Fund (2006). Special thanks to David Young who interpreted the data and prepared this report

## **Bibliography**

- 1: Jones, G and Nicole Armstrong, *LONG-TERM TRENDS IN TOTAL NITROGEN AND TOTAL PHOSPHORUS CONCENTRATIONS IN MANITOBA STREAMS*, Manitoba Conservation Report 2001-07, December 2001.
- 2: Bourne, Alexandra, Nicole Armstrong, and Geoff Jones, *A PRELIMINARY ESTIMATE OF TOTAL NITROGEN AND TOTAL PHOSPHORUS LOADING TO STREAMS IN MANITOBA, CANADA*, Manitoba Conservation Report 2002-04, November 2002.

## APPENDIX 1 – TOTAL PHOPHORUS LEVELS 2001-2006

### HWY 1

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.029	0.037	0.031	0.026	0.016	0.023	
0.033	0.041	0.057	0.03	0.022	0.028	
0.038	0.032	0.053	0.022	0.028	0.056	
0.042	0.021	0.045	0.033	0.042	0.04	
0.037	0.052	0.042	0.048	0.042	0.046	
0.052	0.063	0.046	0.048	0.026	0.055	
0.058	0.063	0.026	0.032	0.035	0.058	
0.058	0.08	0.049	0.032			
0.065	0.061	0.037	0.028			
0.076	0.043	0.035				
0.062	0.058	0.043				
0.056	0.047					
0.056	0.055					
0.049043	0.047701	0.041181	0.032219	0.028644	0.041491	0.040828572

### PR 506

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.034	0.034	0.033	0.036	0.016	0.03	
0.036	0.046	0.064	0.039	0.026	0.031	
0.043	0.037	0.056	0.027	0.038	0.058	
0.041	0.032	0.055	0.038	0.055	0.034	
0.048	0.056	0.049	0.05	0.027	0.034	
0.057	0.069	0.049	0.047	0.032	0.045	
0.056	0.065	0.025	0.034	0.032	0.057	
0.07	0.082	0.062	0.036			
0.062	0.059	0.045	0.032			
0.091	0.042	0.037				
0.064	0.057	0.062				
0.053	0.045					
0.057	0.055					
0.052874	0.05034	0.047046	0.037082	0.030408	0.039863	0.044042388

### KELLNER

2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 02-07
0.037	0.063	0.027	0.016	0.038	
0.042	0.166	0.047	0.022	0.063	
0.069	0.139	0.071	0.028	0.137	
0.07	0.146	0.106	0.042		
0.17		0.153	0.042		
0.167		0.098	0.026		
		0.083	0.035		
	0.083	0.124			
		0.072			
0.077285	0.11199	0.077939	0.028644	0.068963	0.064641

**Hwy 44**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.038	0.034	0.035	0.039	0.013	0.026	
0.03	0.046	0.071	0.038	0.063	0.028	
0.036	0.037	0.069	0.033	0.049	0.05	
0.049	0.032	0.051	0.036	0.179	0.026	
0.048	0.056	0.041	0.042	0.024	0.024	
0.049	0.069	0.035	0.035	0.031	0.041	
0.062	0.065	0.021	0.032	0.027	0.038	
0.056	0.082	0.048	0.05			
0.049	0.059	0.038	0.028			
0.064	0.042	0.029				
0.051	0.057	0.052				
0.045	0.045					
0.061	0.055					
0.048015	0.05034	0.04204	0.036534	0.039281	0.032135	0.042356883

**PR 408**

2003-04	2004-05	2005-06	2006-07	Geometric Mean 03-07
0.034	0.025	0.014	0.028	
0.057	0.054	0.036	0.03	
0.058	0.032	0.062	0.053	
0.057	0.037	0.051	0.029	
0.044	0.044	0.027	0.037	
0.033	0.039	0.031	0.052	
0.021	0.04	0.028	0.042	
0.046	0.053			
0.055	0.027			
0.03				
0.047				
0.04189	0.037785	0.032384	0.037502	0.037787

**SEVEN SISTERS**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.044	0.017	0.039	0.051	0.015	0.035	
0.033	0.019	0.063	0.048	0.04	0.029	
0.041	0.012	0.084	0.037	0.06	0.317	
0.051	0.02	0.055	0.037	0.067	0.04	
0.053	0.04	0.042	0.043	0.035	0.035	
0.403	0.019	0.036	0.037	0.033	0.067	
0.074	0.018	0.031	0.039	0.016	0.044	
0.063	0.025	0.043	0.057			
0.053	0.025	0.071	0.03			
0.062	0.013	0.033				
0.048	0.014	0.058				
0.04	0.025					
0.061	0.025					
0.059469	0.019873	0.04799	0.041378	0.033212	0.053937	0.039444124

**APPENDIX 2: NITROGEN LEVELS 2001 – 2006**

**HWY 1**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.6	0.8	0.6	0.7	0.4	0.7	
0.9	0.7	1	0.7	0.5	0.8	
0.9	0.8	1	0.7	0.6	1.2	
0.8	0.8	0.09	0.9	0.8	1.1	
0.8	1.1	1	1.2	1.1	1.1	
1.1	1	0.9	0.9	0.9	1.4	
1	1.4	1	0.8	0.9	1.5	
1	1.8	1.1	0.8			
1	1.2	1	0.8			
1	1.1	0.09				
1.5	1.7	2.1				
1.6	2.7					
2.1	3.1					
1.042805	1.252455	0.658552	0.82166	0.703801	1.079434	0.922883

**PR 506**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.7	0.6	0.7	0.7	0.5	0.7	
0.8	0.7	0.9	0.9	0.5	0.8	
1	1.2	1.1	0.7	0.6	1.1	
0.8	1	0.9	1	0.9	1	
0.9	1.1	0.9	1.1	1.1	1.1	
1.1	1	0.9	0.7	0.7	1.1	
1	1.3	1	0.9	1	1.4	
1.1	1.6	1.1	0.8			
0.9	1.1	1.1	1			
1.1	1.1	0.9				
1.3	1.7	2.3				
1.5	2.6					
2.6	2.9					
1.07132	1.248376	1.021627	0.855124	0.72368	1.006102	1.006439

**KELLNER**

2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 02-07
0.8	1.2	1	0.7	0.9	
0.9	1.3	1.1	0.9	1.1	
1.1	1.4	1.1	0.9	1.4	
1.2	1.3	1.2	1.4		
1.5		1.3			
1.3		1			
		1.2			
	1	1.1			
		1.5			
1.108299	1.232081	1.157762	0.943904	1.114947	1.120602

**HWY 44**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.7	0.7	0.6	0.7	0.4	0.7	
0.7	0.7	1	1	0.6	0.8	
0.9	0.8	1	0.08	0.7	1	
1	0.8	0.9	0.9	0.8	1.2	
1	1	0.9	1.1	1	0.8	
1	0.8	0.8	0.8	0.8	1	
1	1.2	0.9	0.8	0.9	1.3	
1	1.3	1	0.8			
0.9	0.9	1	0.8			
1	1	0.8				
1	1.5	1.8				
1.4	2.4					
1.8	3					
1.000014	1.108243	0.939592	0.65668	0.716316	0.950105	0.907437

**PR 408**

2003-04	2004-05	2005-06	2006-07	Geometric Mean 03-07
0.7	0.8	0.4	0.7	
1	0.8	0.6	0.7	
1.1	0.7	0.7	1	
1	0.8	0.8	1.1	
0.9	1.4	1	0.9	
0.8	0.7	0.8	1.2	
0.9	0.9	0.9	1.2	
1	0.9			
1	0.8			
0.8				
1.7				
0.965365	0.848349	0.716316	0.95004	0.874433

**SEVEN SISTERS**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
0.7	0.6	0.6	0.8	0.4	0.7	
0.8	0.8	0.9	1	0.7	0.7	
0.9	0.8	1	0.08	0.7	0.9	
1	0.8	0.8	1.2	0.8	0.9	
0.9	1.1	0.7	0.9	0.9	0.8	
1.7	0.8	0.8	0.7	1	1.3	
1.1	1	0.9	0.8	0.08	1.1	
1.1	1.1	0.9	0.9			
0.9	0.9	1.1	0.8			
1	1	0.8				
1	1.3	1.9				
1.2	2.4					
1.9	3.1					
1.051233	1.075904	0.903535	0.671794	0.527001	0.893337	0.869809

## APPENDIX 3: *E.coli* LEVELS 2001 -2006

### HWY 1

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
< 10	10	< 10	<10	4	10	
93	<10	20	30	38	30	
3	<10	20	40	23	30	
70	130	160	10	4	43	
20	10	40	40	10	210	
30	20	20	75	30	430	
> 2000	10	< 10	1570	20	93	
40	30	70	20			
20	10	180	<10			
70	40	20				
40	40	10				
40	20					
70	20					
34.14258	21.68736	36.97024	52.70967	13.55093	61.29311	31.8534

### PR 506

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
2	<10	10	<10	<3	<3	
43	<10	70	70	7	7	
4	20	40	<10	23	23	
50	150	70	20	4	4	
30	10	70	20	30	30	
50	40	110	93	140	140	
130	<10	150	2480	20	20	
10	30	160	60			
30	80	150	40			
40	90	50				
40	30	10				
40	70					
< 10	20					
25.16163	40.15027	58.44253	76.6177	19.44737	19.44737	36.01383

### Kellner

2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 02-07
<10	30	<10	23	20	
<10	40	<10	240	100	
160	40	20	43	180	
20	20	80	43		
20		120			
30		9300			
		1630			
	220	90			
		80			
37.22419	46.23158	214.5927	56.52219	71.13787	77.81517



**HWY 44**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
2	30	< 10	30	15	<10	
75	20	100	30	21	40	
1	10	10	20	93	30	
40	150	20	20	230	93	
30	10	40	80	40	60	
90	20	40	210	200	93	
70	10	30	2050	50	43	
50	60	160	40			
80	80	110	20			
60	160	30				
80	70	10				
10	<10					
< 10	<10					
27.85006	35.0072	37.19551	59.89409	59.67567	54.6967	41.31055

**PR 408**

2003-04	2004-05	2005-06	2006-07	Geometric Mean 03-07
20	<10	15	<10	
110	30	43	20	
80	60	93	40	
30	20	43	93	
60	230	70	380	
50	430	460	1500	
60	180	50	430	
340	40			
200	60			
80				
20				
65.99381	79.13577	63.47746	162.238	81.05393

**SEVEN SISTERS**

2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Geometric Mean 01-07
10	<10	< 10	<10	9	20	
93	<10	130	20	93	10	
0	10	80	20	38	30	
80	60	70	30	43	93	
10	30	130	80	110	100	
>2000	70	30	930	350	210	
110	60	70	2290	110	210	
10	100	60	80			
40	190	190	100			
130	300	10				
50	80	10				
60	10					
<10	<10					
50.78704	56.72162	54.3901	106.3433	66.56739	58.90515	63.46355

## Appendix 4

### POPULATION AND AREA 2001

\* Extracted from "Statistical Information" from Municipalities of the Province of Manitoba

\*\* Extracted from Census of Agriculture, Statistics Canada.

R.M.	Population* 2001 Census	Area* (Sq Km)	RM Area in Acres (sq km X 247.10538)	Total Area** of Farms - Farms Rep.	Total Area** of Farms - Acres	Average Size of Farms - Acres	Total Area of Farms as a % of RM Area
Whitemouth	1,617	702.91	173,693	127	64,647	509	37

Source: Statistics Canada

### All Livestock by Rural Municipality, May 15, 2001

Variable name	Dairy cows		Cattle and Calves		Total pigs		Total sheep and lambs		Total hens and chickens	
	Farms	Number	Farms	Number	Farms	Number	Farms	Number	Farms	Number of birds
Reynolds <sup>1</sup>	2	x	23	1,926	9	14,265	2	x	7	1,128
Whitemouth	16	986	54	5,924	26	29,916	5	237	30	352,269

Source: Statistics Canada

1. Due to confidentiality constraints, the data for one or more adjacent geographic areas having very few farms have been combined with the data from this census consolidated subdivision or census division.

**Whitemouth River Site #1**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
APR 24-01	12	10	0.02	140	0.03	0.7	7.69	0.016	0.044	88	35	6
MAY 15-01	9	93	0.01	162	< .01	0.8	7.77	0.01	0.033	120	20	10
JUN 5-01	< 10	1	0.02	163	< .01	0.9	7.95	0.014	0.041	140	21	12
JUN 19-01	80	80	0.14	187	0.01	1	7.86	0.015	0.051	88	12	11
JUL 4-01	60	10	0.02	166	0.03	0.9	7.92	0.028	0.053	130	21	15
JUL 17-01	> 2000	> 2000	0.03	134	0.72	1.7	7.46	0.257	0.403	120	170	19
JUL 31-01	90	110	0.02	204	0.02	1.1	7.64	0.042	0.074	180	34	20
AUG 14-01	20	10	0.02	224	0.03	1.1	7.75	0.041	0.063	180	12	16
AUG 28-01	20	40	0.02	232	< .01	0.9	8.06	0.028	0.053	180	13	17
SEP 11-01	120	130	0.01	240	< .01	1	8.17	0.021	0.062	180	16	10
OCT 19-01	80	50	0.02	246	< .01	1	8.09	0.016	0.048	190	11	5
JAN 11-02	70	60	0.13	350	0.22	1.2	7.44	0.016	0.04	250	12	-5
FEB 13-02	< 10	<10	0.2	456	0.39	1.9	7.42	0.034	0.061	330	18	-5

**Whitemouth River Site #2**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
APR 24-01	2	2	0.02	144	0.05	0.7	7.72	0.016	0.038	88	23	5
MAY 15-01	9	75	0.01	163	0.01	0.7	7.8	0.011	0.03	120	15	11
JUN 5-01	< 10	1	0.01	163	< .01	0.9	8	0.011	0.036	130	14	12
JUN 19-01	70	40	0.08	195	0.01	1	7.99	0.015	0.049	66	23	11
JUL 4-01	60	30	0.01	165	0.03	1	7.86	0.034	0.048	130	17	15
JUL 17-01	110	90	0.01	187	0.02	1	7.8	0.022	0.049	160	24	21
JUL 31-01	120	70	0.02	205	0.01	1	7.73	0.034	0.062	160	22	20
AUG 14-01	50	50	0.02	224	0.03	1	7.84	0.039	0.056	180	8	16
AUG 28-01	20	80	0.02	235	< .01	0.9	8.08	0.028	0.049	180	10	17
SEP 11-01	100	60	0.01	246	< .01	1	8.18	0.022	0.064	180	13	10
OCT 19-01	80	80	0.02	260	< .01	1	8.11	0.017	0.051	200	18	5
JAN 11-02	10	10	0.16	359	0.17	1.4	7.55	0.018	0.045	250	13	-5
FEB 13-02	< 10	< 10	0.22	450	0.29	1.8	7.45	0.017	0.061	330	20	-5

**Whitemouth River Site #3**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
APR 24-01	2	2	0.02	144	0.02	0.7	7.74	0.014	0.034	82	27	5
MAY 15-01	3	43	0.01	178	0.01	0.8	7.83	0.012	0.036	130	17	13
JUN 5-01	< 10	4	0.01	179	< .01	1	7.96	0.013	0.043	140	14	14
JUN 19-01	50	50	0.06	169	0.02	0.8	8	0.014	0.041	62	11	12
JUL 4-01	30	30	0.01	169	0.02	0.9	7.74	0.028	0.048	130	15	15
JUL 17-01	70	50	0.02	198	0.01	1.1	7.72	0.021	0.057	180	29	21
JUL 31-01	240	130	0.02	212	< .01	1	7.65	0.031	0.056	160	23	20
AUG 14-01	20	10	0.02	246	0.03	1.1	7.72	0.04	0.07	190	14	15
AUG 28-01	< 10	30	0.02	246	0.01	0.9	7.93	0.037	0.062	190	21	15
SEP 11-01	20	40	0.02	261	< .01	1.1	8.12	0.023	0.091	200	21	10
OCT 19-01	< 10	40	0.02	260	0.02	1.3	8.08	0.016	0.064	200	22	5
JAN 11-02	50	40	0.24	363	0.12	1.5	7.37	0.015	0.053	270	19	-5
FEB 13-02	< 10	< 10	0.35	452	0.2	2.6	7.47	0.038	0.057	330	21	-5

**Whitemouth River Site #4**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
APR 24-01	14	< 10	0.01	125	< .01	0.6	7.52	0.015	0.029	72	18	5
MAY 15-01	15	93	< .01	168	< .01	0.9	7.7	0.012	0.033	120	12	12
JUN 5-01	9	3	0.01	169	< .01	0.9	7.87	0.015	0.038	140	9	13
JUN 19-01	170	70	0.05	171	0.01	0.8	7.99	0.013	0.042	92	13	11
JUL 4-01	20	20	0.01	153	0.01	0.8	7.41	0.023	0.037	120	11	15
JUL 17-01	60	30	0.01	186	0.02	1.1	7.6	0.023	0.052	170	12	20
JUL 31-01	> 2000	> 2000	0.01	192	< .01	1	7.54	0.03	0.058	150	31	20
AUG 14-01	60	40	0.02	230	0.02	1	7.61	0.042	0.058	180	6	15
AUG 28-01	20	20	0.02	236	0.01	1	7.67	0.034	0.065	180	9	14
SEP 11-01	20	70	0.02	253	< .01	1	7.91	0.022	0.076	200	19	10
OCT 19-01	30	40	0.03	245	0.04	1.5	7.96	0.017	0.062	190	21	5
JAN 11-02	40	40	0.27	349	0.08	1.6	7.54	0.016	0.056	270	21	-5
FEB 13-02	30	70	0.36	441	0.15	2.1	7.53	0.029	0.056	320	23	-5

**Whitemouth River Site #1 Seven Sisters**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
MAY 1-2002	<10	<10	0.04	182	0.06	0.6	9.2	8.01	0.017	0.039	130	9	0
MAY 15-2002	<10	<10	0.03	181	0.15	0.8	10.2	7.87	0.019	0.046	130	21	3
JUNE 5-2002	<10	10	0.02	173	0.01	0.8	8.1	7.91	0.012	0.034	140	20	10.8
JUNE 18-2002	150	60	0.04	176	0.06	0.8	8.5	7.82	0.02	0.058	160	71	14
JULY 4-2002	<10	30	0.04	189	0.05	1.1	8.4	7.91	0.04	0.052	150	33	15
JULY 17-2002	70	70	0.02	203	0.01	0.8	7.4	8.04	0.019	0.05	160	21	20
JULY 31-2002	50	60	0.02	263	<0.01	1	7.1	8.01	0.018	0.049	210	13	20
AUGUST 12-2002	160	100	0.02	273	<0.01	1.1	6.9	8.02	0.025	0.051	210	17	17
AUGUST 27-2002	460	190	0.02	211	<0.01	0.9	8.1	7.98	0.025	0.051	180	19	16
SEPT 10-2002	380	300	0.03	225	0.02	1	8.3	7.95	0.013	0.042	160	22	15
OCT 11-2002	80	80	0.02	251	0.07	1.3	12.1	7.99	0.014	0.052	180	20	
JAN.2/2003	180	10	0.62	406	0.27	2.4	2	7.66	0.025	0.046	290	13	
FEB 20/2003	270	<10	0.91	542	0.57	3.1	6.1	7.33	0.025	0.063	410	19	

**Whitemouth River Site #2 Hwy 44 at Whitemouth**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
MAY 1-2002	20	30	0.05	183	0.06	0.7	8.7	8.02	0.017	0.033	130	8	0
MAY 15-2002	<10	20	0.02	170	0.11	0.7	9.2	7.84	0.02	0.043	140	24	4
JUNE 5-2002	30	10	0.01	176	0.01	0.8	8.9	7.94	0.011	0.029	140	15	11
JUNE 18-2002	180	150	0.03	177	0.06	0.8	9	7.84	0.018	0.044	160	42	14
JULY 4-2002	<10	10	0.03	192	0.05	1	7.5	7.92	0.047	0.051	150	34	15
JULY 17-2002	20	20	0.02	209	<0.01	0.8	7.7	8.07	0.016	0.054	170	17	20
JULY 31-2002	<10	10	0.03	269	<0.01	1.2	8.6	8.19	0.021	0.052	220	18	20
AUGUST 12-2002	30	60	0.03	276	<0.01	1.3	7.5	8.14	0.029	0.06	210	21	16
AUGUST 27-2002	60	80	0.02	220	<0.01	0.9	8.5	8.01	0.025	0.049	180	12	15
SEPT 10-2002	190	160	0.02	233	0.05	1	8.7	8.01	0.013	0.04	190	20	15
OCT 11-2002	100	70	0.02	253	0.08	1.5	11.3	8.02	0.013	0.055	190	19	
JAN.2/2003	110	<10	0.66	401	0.23	2.4	3.2	7.67	0.02	0.045	290	15	
FEB 20/2003	280	<10	0.96	512	0.33	3	4.3	7.4	0.025	0.057	390	20	

### Whitemouth River Site #3 Bridge on 506

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
MAY 1-2002	<10	<10	0.05	188	0.06	0.6	9.4	7.91	0.014	0.034	120	14	0
MAY 15-2002	<10	<10	0.02	163	0.07	0.7	12.1	7.84	0.019	0.046	98	25	3
JUNE 5-2002	10	20	0.02	202	0.02	1.2	9.2	7.97	0.017	0.037	150	20	11
JUNE 18-2002	90	150	0.02	180	0.05	1	7.6	7.74	0.015	0.032	150	17	14
JULY 4-2002	40	10	0.03	213	0.06	1.1	7.3	7.86	0.04	0.056	160	31	16
JULY 17-2002	40	40	0.02	228	0.01	1	7.8	7.96	0.029	0.069	180	24	20
JULY 31-2002	10	<10	0.03	273	0.01	1.3	3	8.08	0.024	0.065	220	21	20
AUGUST 12-2002	10	30	0.04	283	<0.01	1.6	7.5	8.08	0.035	0.082	220	44	16
AUGUST 27-2002	80	80	0.02	250	0.02	1.1	7.6	8.01	0.031	0.059	210	18	15
SEPT 10-2002	40	90	0.02	251	0.06	1.1	9	7.99	0.013	0.042	200	20	15
OCT 11-2002	80	30	0.03	259	0.09	1.7	11.7	7.98	0.014	0.057	180	22	
JAN. 02/2003	2230	70	0.72	401	0.2	2.6	2.1	7.62	0.023	0.045	300	13	
FEB 20/2003	470	20	1.03	494	0.22	2.9	1.3	7.42	0.021	0.055	390	19	

### Whitemouth River Site #4 South of Hwy 1

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
MAY 1-2002	<10	10	0.05	172	0.05	0.8	5.6	7.82	0.016	0.037	110	12	0
MAY 15-2002	<10	<10	0.02	138	0.03	0.7	11.9	7.72	0.018	0.041	98	21	2.5
JUNE 5-2002	<10	<10	0.02	191	<0.01	0.8	10.1	7.85	0.014	0.032	140	16	11
JUNE 18-2002	30	130	0.02	162	0.05	0.8	7	7.62	0.007	0.021	140	21	15
JULY 4-2002	<10	10	0.03	204	0.04	1.1	8.1	7.78	0.032	0.052	160	20	16
JULY 17-2002	30	20	0.02	219	<0.01	1	7.3	7.94	0.023	0.063	170	22	20
JULY 31-2002	10	10	0.03	253	0.01	1.4	8.2	8.04	0.025	0.063	210	40	20
AUGUST 12-2002	40	30	0.03	264	0.01	1.8	5.9	8.03	0.029	0.08	210	32	16
AUGUST 27-2002	10	10	0.02	244	0.02	1.2	8.6	7.95	0.029	0.061	200	18	15
SEPT 10-2002	30	40	0.02	250	0.07	1.1	8.3	7.82	0.017	0.043	230	15	15
OCT 11-2002	20	40	0.07	250	0.08	1.7	10.8	7.93	0.019	0.058	220	25	
JAN.2/2003	380	20	0.78	391	0.17	2.7	1.2	7.66	0.039	0.047	290	14	
FEB 20/2003	300	20	1.12	490	0.16	3.1	3.6	7.49	0.021	0.055	400	16	



### Whitemouth River Site #1 Seven Sisters

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
30-Apr-03	10	< 10	0.02	227	0.06	0.6	n/a	8.43	0.03	0.039	160	11	9
22/May/03	170	130	0.03	215	0.16	0.9	n/a	7.9	0.018	0.063	150	24	14
18/Jun/03	110	80	0.02	189	0.02	1	n/a	8.07	0.014	0.084	130	35	21
4/Jul/03	110	70	0.02	173	0.03	0.8	n/a	8.09	0.019	0.055	150	33	22
17/Jul/03	130	130	0.03	186	0.02	0.7	n/a	8.09	0.018	0.042	140	18	22
30/Jul/03	20	30	0.03	210	0.02	0.8	n/a	8	0.031	0.036	150	9	25
12/Aug/03	90	70	0.03	236	< 0.01	0.9	n/a	8.05	0.01	0.031	170	14	26
9-Sept.-03	4	60	0.03	205	< 0.01	0.9	n/a	8.05	0.017	0.043	150	15	21
23-Sept.-03	310	190	0.03	163	0.04	1.1	n/a	7.99	0.015	0.071	150	34	11
22/Oct/03	60	10	0.01	168	< 0.01	0.8	n/a	7.99	0.016	0.033	140	16	9
27/Feb/04	10	10	0.17	403	0.31	1.9	0.5	7.58	0.027	0.058	320	14	

### Whitemouth River Site #2 Hwy 44 at Whitemouth

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
30-Apr-03	< 10	< 10	0.02	237	0.06	0.6	n/a	8.33	0.033	0.035	160	8	10
22/May/03	60	100	0.01	196	0.15	1	n/a	7.9	0.016	0.071	140	33	13
18/Jun/03	20	10	0.02	192	0.02	1	n/a	8.14	0.014	0.069	140	37	21
4/Jul/03	40	20	0.01	175	0.02	0.9	n/a	8.14	0.015	0.051	150	28	22
17/Jul/03	40	40	0.03	189	0.01	0.9	n/a	8.11	0.017	0.041	140	25	21
30/Jul/03	60	40	0.02	212	0.04	0.8	n/a	8.08	0.006	0.035	160	< 5	23
12/Aug/03	60	30	0.02	237	0.02	0.9	n/a	8.22	0.008	0.021	180	9	25
9-Sept.-03	220	160	0.03	207	< 0.01	1	n/a	8.11	0.017	0.048	150	19	21
23-Sept.-03	170	110	0.02	156	0.02	1	n/a	7.97	0.014	0.038	150	30	11
22/Oct/03	70	30	0.01	165	< 0.01	0.8	n/a	7.98	0.016	0.029	130	12	9
27/Feb/04	< 10	10	0.23	408	0.26	1.8	1.4	7.74	0.022	0.052	310	13	



### Whitemouth River Site #3 Bridge on 506

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
30-Apr-03	10	10	0.02	219	0.12	0.7	n/a	8.21	0.014	0.033	150	13	10
22/May/03	70	70	0.22	182	0.19	0.9	n/a	7.9	0.017	0.064	120	35	11
18/Jun/03	70	40	0.01	199	0.01	1.1	n/a	8.08	0.015	0.056	140	53	21
4/Jul/03	100	70	0.01	200	< 0.01	0.9	n/a	8.18	0.02	0.055	160	33	24
17/Jul/03	100	70	0.03	210	< 0.01	0.9	n/a	8.1	0.018	0.049	150	34	22
30/Jul/03	160	110	0.04	242	0.04	0.9	n/a	8.08	0.023	0.049	300	20	22
12/Aug/03	90	150	0.04	267	0.03	1	n/a	8.16	0.007	0.025	200	11	23
9-Sept.-03	210	160	0.04	254	< 0.01	1.1	n/a	8.14	0.02	0.062	170	30	20
23-Sept.-03	180	150	0.02	182	0.05	1.1	n/a	8.02	0.016	0.045	160	33	10
22/Oct/03	180	50	0.01	194	< 0.01	0.9	n/a	8.05	0.017	0.037	160	16	8
27/Feb/04	< 10	10	0.42	572	0.3	2.3	2	7.92	0.029	0.062	420	24	

### Whitemouth River Site #4 South of Hwy 1

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
30/Apr/03	< 10	< 10	0.02	206	0.14	0.6	n/a	8.13	0.011	0.031	140	13	10
22/May/03	100	20	0.06	166	0.16	1	n/a	7.76	0.016	0.057	130	24	11
18/Jun/03	120	20	0.02	197	0.01	1	n/a	7.96	0.014	0.053	140	33	21
4/Jul/03	240	160	0.01	194	< 0.01	0.09	n/a	8.06	0.017	0.045	170	25	23
17/Jul/03	40	40	0.02	195	< 0.01	1	n/a	8.01	0.02	0.042	150	17	20
30/Jul/03	40	20	0.02	231	< 0.01	0.9	n/a	8.06	0.021	0.046	180	12	23
12/Aug/03	50	< 10	0.02	252	< 0.01	1	n/a	8.1	0.006	0.026	200	10	23
9-Sept.-03	40	70	0.02	251	< 0.01	1.1	n/a	8.07	0.19	0.049	170	14	20
23-Sept.-03	100	180	< 0.01	177	0.08	1	n/a	7.94	0.017	0.037	150	15	10
22/Oct/03	20	20	0.01	190	< 0.01	0.09	n/a	7.94	0.019	0.035	160	14	8
27/Feb/04	20	10	0.31	396	0.12	2.1	1	7.71	0.023	0.043	310	9	

**Whitemouth River Kellner Creek Site #5**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
30-Apr.03	no samples												
22/May/03	40	30	< 0.01	280	0.06	1.2	n/a	7.79	0.045	0.063	210	24	12
18-Jun-03	20	40	0.02	304	< 0.01	1.3	n/a	8.06	0.155	0.166	230	< 5	20
4/Jul/03	40	40	0.01	278	< 0.01	1.4	n/a	7.9	0.13	0.139	240	7	22
17/Jul/03	40	20	0.02	300	< 0.01	1.3	n/a	8	0.135	0.146	230	< 5	20
30/Jul/03	no sample												
12/Aug/03	no sample												
9-Sep-03	no sample												
23-Sep-03	150	220	0.02	278	0.02	1	n/a	7.9	0.076	0.083	210	9	11
22-Oct-03	no sample												
27/Feb/04	no sample												

**Whitemouth River Site # 408**

Sample Date	Fecal coliform bacteria (org/100ml)	E. coli bacteria (org/100ml)	Ammonia (mg/L)	Conductivity (µmhos/cm)	Nitrite/nitrate Nitrogen (mg/L)	Nitrogen Total Kjeldahl (mg/L)	Oxygen Dissolved mg/L	pH (pH units)	Dissolved phosphorus (mg/L)	Total phosphorus (mg/L)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Water Temp (Celsius)
30-Apr-03	20	20	0.01	232	0.04	0.7	n/a	8.41	0.028	0.034	160	9	10
22-May-03	40	110	0.01	200	0.13	1	n/a	7.97	0.015	0.057	140	37	14
18-Jun-03	80	80	0.01	192	0.02	1.1	n/a	8.14	0.013	0.058	150	46	21
4/Jul/03	30	30	0.01	175	0.03	1	n/a	8.13	0.016	0.057	150	32	22
17/Jul/03	70	60	0.02	191	0.01	0.9	n/a	8.14	0.017	0.044	140	21	20
30/Jul/03	70	50	0.02	215	0.03	0.8	n/a	8.15	0.02	0.033	170	< 5	25
12/Aug/03	110	60	0.02	236	< 0.01	0.9	n/a	8.22	0.007	0.021	180	9	25
9-Sept.-03	380	340	0.03	204	0.01	1	n/a	8.15	0.017	0.046	160	14	21
23-Sept.03	190	200	0.03	159	0.03	1	n/a	7.98	0.014	0.055	140	44	11
22-Oct-03	50	80	0.01	166	< 0.01	0.8	n/a	8	0.015	0.03	130	11	8
27/Feb/04	< 10	20	0.16	380	0.27	1.7	2.7	7.84	0.021	0.047	290	15	

### Whitemouth River Site #1 Seven Sisters

Sample Date	Ammonia Dissolved (mg/L)	Nitrite/ Nitrate-N (mg/L)	Dissolved Phosphorus (mg/L)	Total Phosphorus (mg/L)	Conductivity (umhos/cm)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Total dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total suspended Solids (mg/L)	pH (pH units)
28-Apr-04	0.02	0.02	0.012	0.051	133	<10	<10	92	0.8	27	7.9
20/May/04	0.01	0.07	0.019	0.048	159	20	30	120	1	36	7.86
17/Jun/04	0.02	0.01	0.012	0.037	167	20	10	140	0.08	27	7.74
7/Jul/04	<0.01	0.02	0.025	0.037	185	30	n/a	140	1.2	14	7.94
22/Jul/04	<0.01	<0.01	n/a	0.043	207	80	80	150	0.9	14	8.13
19/Aug/04	0.01	0.02	0.023	0.037	202	930	210	160	0.7	21	8.17
9/Sep/04	0.02	0.03	0.02	0.039	218	2290	120	170	0.8	19	8.02
23/Sep/04	<0.01	0.03	0.041	0.057	210	80	70	160	0.9	16	8.04
21/Oct/04	<0.01	0.03	0.016	0.03	194	100	50	150	0.8	7	7.99

### Whitemouth River Site #2 Hwy 44 at Whitemouth

Sample Date	Ammonia Dissolved (mg/L)	Nitrite/ Nitrate-N (mg/L)	Dissolved Phosphorus (mg/L)	Total Phosphorus (mg/L)	Conductivity (umhos/cm)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Total dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total suspended Solids (mg/L)	pH (pH units)
28-Apr-04	0.02	0.01	0.012	0.039	134	30	10	90	0.7	21	7.95
20/May/04	<0.01	0.05	0.015	0.038	157	30	60	120	1	35	7.9
17/Jun/04	0.02	0.01	0.013	0.033	165	20	30	150	0.08	15	7.75
7/Jul/04	<0.01	0.01	0.027	0.036	185	20	n/a	140	0.9	15	7.97
22/Jul/04	0.04	<0.01	n/a	0.042	207	80	70	150	1.1	15	8.13
19/Aug/04	<0.01	<0.01	0.024	0.035	203	210	150	110	0.8	15	8.28
9/Sep/04	0.02	0.03	0.017	0.032	207	2050	50	170	0.8	17	8.07
23/Sep/04	0.01	0.02	0.032	0.05	203	40	40	150	0.8	17	8.05
21/Oct/04	0.04	0.03	0.016	0.028	199	20	40	150	0.8	7	8.03



### Whitemouth River Site #3 Bridge on 506

Sample Date	Ammonia Dissolved (mg/L)	Nitrite/ Nitrate-N (mg/L)	Dissolved Phosphorus (mg/L)	Total Phosphorus (mg/L)	Conductivity (umhos/cm)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Total dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total suspended Solids (mg/L)	pH (pH units)
28-Apr-04	0.02	<0.01	0.01	0.036	142	<10	<10	100	0.7	22	7.95
20/May/04	0.01	0.03	0.015	0.039	155	70	20	120	0.9	34	7.87
17/Jun/04	0.01	<0.01	0.011	0.027	179	<10	10	150	0.7	<5	7.7
7/Jul/04	<0.01	<0.01	0.021	0.038	206	20	n/a	160	1	14	7.94
22/Jul/04	<0.01	<0.01	n/a	0.05	237	20	20	170	1.1	22	8.1
19/Aug/04	<0.01	<0.01	0.023	0.047	245	93	43	170	0.7	21	8.23
9/Sep/04	0.02	0.02	0.017	0.034	217	2480	20	160	0.9	7	8.04
23/Sep/04	0.01	0.02	0.026	0.036	219	60	60	160	0.8	17	8.1
21/Oct/04	0.02	0.03	0.016	0.032	215	40	10	150	1	9	8.04

### Whitemouth River Site #4 South of Hwy 1

Sample Date	Ammonia Dissolved (mg/L)	Nitrite/ Nitrate-N (mg/L)	Dissolved Phosphorus (mg/L)	Total Phosphorus (mg/L)	Conductivity (umhos/cm)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Total dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total suspended Solids (mg/L)	pH (pH units)
28/Apr/04	0.01	<0.01	0.011	0.026	136	<10	10	100	0.7	13	7.82
20/May/04	0.01	0.01	0.016	0.03	141	30	<10	110	0.7	22	7.68
17/Jun/04	<0.01	<0.01	0.01	0.022	168	40	20	140	0.7	12	7.65
7-Jul-04	<0.01	<0.01	0.023	0.033	198	10	n/a	160	0.9	7	7.83
22/Jul/04	<0.01	<0.01	n/a	0.048	227	40	10	170	1.2	15	7.97
19-Aug.-04	<0.01	<0.01	0.025	0.048	222	75	4	150	0.9	11	8.2
9/Sep/04	0.01	0.01	0.017	0.032	205	1570	<10	160	0.8	16	7.95
23/Sep/04	<0.01	<0.01	0.023	0.032	199	20	20	140	0.8	5	7.97
21/Oct/04	<0.01	0.02	0.016	0.028	196	<10	<10	150	0.8	7	7.94

### Whitemouth River Site # 408

Sample Date	Ammonia Dissolved (mg/L)	Nitrite/ Nitrate-N (mg/L)	Dissolved Phosphorus (mg/L)	Total Phosphorus (mg/L)	Conductivity (umhos/cm)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Total dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total suspended Solids (mg/L)	pH (pH units)
28-Apr-04	0.02	0.01	0.012	0.025	134	<10	<10	98	0.8	25	7.96
20/May/04	<0.01	0.05	0.022	0.054	156	30	50	120	0.8	36	7.93
17-Jun-04	0.02	0.01	0.013	0.032	165	60	20	150	0.7	25	7.77
7/Jul/04	<0.01	<0.01	0.028	0.037	184	20	n/a	140	0.8	15	8
22/Jul/04	<0.01	0.03	n/a	0.044	206	230	290	150	1.4	16	8.14
19/Aug/04	<0.01	<0.01	0.023	0.039	202	430	230	180	0.7	16	8.23
9/Sep/04	0.02	0.02	0.017	0.04	210	180	90	160	0.9	19	8.12
23/Sep/04	<0.01	0.03	0.034	0.053	203	40	30	150	0.9	13	8.08
21-Oct-04	0.02	0.02	0.014	0.027	193	60	30	150	0.8	7	8.02

### Whitemouth River Kelner Drain

Sample Date	Ammonia Dissolved (mg/L)	Nitrite/ Nitrate-N (mg/L)	Dissolved Phosphorus (mg/L)	Total Phosphorus (mg/L)	Conductivity (umhos/cm)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Total dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total suspended Solids (mg/L)	pH (pH units)
28/Apr/04	0.01	<0.01	0.017	0.027	226	<10	<10	170	1	5	7.89
20-May-04	<0.01	<0.01	0.037	0.047	247	<10	20	190	1.1	6	8.11
17/Jun/04	<0.01	<0.01	0.057	0.071	259	20	20	220	1.1	7	7.7
7/Jul/04	<0.01	<0.01	0.095	0.106	278	80	n/a	210	1.2	5	7.89
22/Jul/04	<0.01	0.03	n/a	0.153	303	120	120	240	1.3	<5	7.92
19/Aug/04	<0.01	<0.01	0.09	0.098	323	9300	1500	250	1	<5	8.34
9/Sep/04	0.01	<0.01	0.071	0.083	337	1630	160	250	1.2	<5	7.97
23-Sep-04	<0.01	0.02	0.12	0.124	308	90	90	270	1.1	<5	7.71
21-Oct-04	0.18	0.02	0.06	0.072	314	80	70	230	1.5	7	7.91

**Whitemouth River Site #1 Seven Sisters**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+ Nitrite-N (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
May 5-05	0.006	0.015	<0.01	124	9	9	0.05	92	0.4	12	7.97
May 24-05	0.009	0.04	0.06	197	93	150	0.02	140	0.7	21	8
June 16-05	0.029	0.06	0.03	179	38	38	0.02	150	0.7	31	7.88
July 15-05	0.04	0.067	0.01	207	43	43	0.04	140	0.8	14	7.9
Aug.15-05	0.021	0.035	<0.01	272	110	<10	0.01	190	0.9	8	8.18
Sept 12-05	0.016	0.033	0.03	230	350	440	0.01	170	1	8	8.15
Oct.03-05	0.015	0.016	0.03	232	110	110	0.02	190	0.08	14	8.12

**Whitemouth River Site #2 Hwy 44 at Whitemouth**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E. Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+ Nitrite-N (mg/l)	Total Dissolved Solids (mg/l)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
May 05-05	0.006	0.013	<0.01	125	15	15	0.05	86	0.4	9	8.01
May 24-05	0.009	0.063	0.02	189	21	150	0.01	130	0.7	21	8.01
June 16-05	0.025	0.049	0.03	178	93	93	0.02	140	0.6	25	7.91
July 15-05	0.13	0.179	0.05	206	230	230	0.05	140	0.9	22	7.95
Aug.15-05	0.018	0.024	0.02	280	40	50	0.02	180	0.9	<5	8.3
Sept 12-05	0.014	0.031	0.02	226	200	340	0.01	170	0.9	8	8.07
Oct.03-05	0.019	0.027	0.02	241	50	10	0.02	180	0.9	12	8.16

**Whitemouth River Site #3 Bridge on 506**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/l)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E. Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+ Nitrite-N (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
May 5 05	0.006	0.016	0.02	160	<3	<3	0.05	110	0.5	13	8.01
May 24-05	0.006	0.026	0.01	186	7	93	<0.01	130	0.5	19	7.98
June 16-05	0.017	0.038	<0.01	183	23	23	<0.01	140	0.6	14	7.93
July 15-05	0.035	0.055	<0.01	224	4	9	0.02	150	0.9	21	7.81
Aug.15.-05	0.016	0.027	0.02	282	30	<10	0.01	190	1.1	<5	8.24
Sept 12-05	0.013	0.032	0.01	230	140	90	<0.01	170	0.7	12	8.13
Oct.03-05	0.019	0.032	0.02	252	20	40	0.01	190	1	19	8.14

**Whitemouth River Site #4 South of Hwy 1**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity (mg/L)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+ Nitrite-N (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
May 5 05	0.005	0.016	<0.01	151	4	4	0.05	94	0.4	9	7.91
May 24-05	0.007	0.022	<0.01	172	38	38	<0.01	120	0.5	12	7.87
June 16-05	0.013	0.028	0.02	156	23	23	<0.01	130	0.6	11	7.76
July 15-05	0.034	0.042	<0.01	216	4	4	0.01	150	0.8	10	7.81
Aug.15.-05	0.02	0.042	0.02	262	10	<10	<0.01	180	1.1	7	8.21
Sept 12-05	0.013	0.026	0.03	227	30	20	<0.01	170	0.9	6	8.08
Oct.03-05	0.011	0.035	0.01	242	20	10	<0.01	200	0.9	16	8.1



**Whitemouth River #408**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+ Nitrite-N (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	Ph (pH units)
May 5 05	0.005	0.014	0.02	125	15	15	0.05	90	0.4	12	8.01
May 24-05	0.008	0.036	0.02	190	43	43	0.02	130	0.6	18	8.03
June 16-05	0.025	0.062	0.02	178	93	93	0.02	140	0.7	22	7.91
July 15-05	0.035	0.051	0.01	206	43	43	0.04	140	0.8	19	8.01
Aug. 15-05	0.017	0.027	0.02	276	70	220	<0.01	190	1	<5	8.3
Sept 12-05	0.014	0.031	0.03	225	460	340	0.01	0.014	0.8	9	8.19
Oct. 03-05	0.015	0.028	0.02	234	50	70	0.01	200	0.9	11	8.16

**Whitemouth River Kelner Drain**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E. Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+ Nitrite-N (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
May 5 05	0.013	0.02	<0.01	222	23	43	0.04	150	0.7	9	7.65
May 24-05	0.054	0.073	0.02	295	240	240	0.02	210	0.9	8	7.81
June 16-05	0.1	0.122	<0.01	240	43	43	0.03	190	0.9	<5	7.8
July 15-05	0.036	0.05	<0.01	295	43	93	0.04	220	1.4	16	7.82

**Whitemouth River Site #1 - 307 Seven Sisters**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+Nitrite-N - Soluble (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
24-Apr-06	0.007	0.035	0.016	157	20	10	n/a	120	0.7	45	8.19
18-May-06	0.012	0.029	0.011	169	10	<10	0.011	130	0.7	15	8.21
16-Jun-06	0.023	0.317	0.016	219	30	<10	<0.005	150	0.9	19	8.25
11-Jul-06	0.01	0.04	0.06	273	93	93	<0.005	180	0.9	12	8.31
16-Aug-06	0.017	0.035	0.007	347	100	140	<0.005	210	0.8	<5	8.54
8-Sep-06	0.023	0.067	0.008	331	210	210	<0.005	250	1.3	22	8.36
02-Oct-06	0.015	0.044	0.011	328	210	210	<0.005	220	1.1	9	8.34

**Whitemouth River Site #2 - Hwy 44 at Whitemouth**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E. Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+Nitrite-N - Soluble (mg/L)	Total Dissolved Solids (mg/l)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
24-Apr-06	0.007	0.026	0.012	158	<10	<10		110	0.7	28	8.19
18-May-06	0.012	0.028	0.015	168	20	40	0.009	130	0.8	12	8.17
16-Jun-06	0.022	0.05	0.013	223	50	30	<0.005	160	1	11	8.32
11-Jul-06	0.006	0.026	0.012	268	93	93	0.042	190	1.2	5	8.33
11-Aug-06	0.015	0.024	0.007	351	30	60	0.006	230	0.8	<5	8.51
8-Sep-06	0.019	0.041	0.008	301	43	93	<0.05	220	1	9	8.46
02-Oct-06	0.014	0.038	0.01	333	43	43	<0.005	230	1.3	8	8.37

**Whitemouth River Site #3 Bridge on 506**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/l)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E. Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+Nitrite-N - Soluble (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
24-Apr-06	0.006	0.030	0.011	175	40	<10	n/a	130	0.7	26	8.20
18-May-06	0.014	0.031	0.015	181	<10	<10	0.007	140	0.8	14	8.16
16-Jun-06	0.026	0.058	0.008	244	10	60	<0.005	170	1.1	19	8.31
11-Jul-06	0.008	0.034	0.012	309	93	150	0.031	210	1	13	8.39
16-Aug-06	0.015	0.034	0.012	346	200	270	0.005	230	1.1	<5	8.44
8-Sep-06	0.019	0.045	<0.003	308	430	430	0.036	220	1.1	13	8.4
2-Oct-06	0.014	0.057	0.008	330	150	430	0.016	240	1.4	17	8.21

**Whitemouth River Site #4 PTH 1**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity (mg/L)	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+Nitrite-N - Soluble (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	PH (pH units)
24-Apr-06	0.006	0.023	0.007	170	10	<10		130	0.7	13	8.14
18-May-06	0.014	0.028	0.012	175	30	30	0.008	120	0.8	9	8.06
16-Jun-06	0.027	0.056	0.006	236	30	10	<0.005	170	1.2	13	8.32
11-Jul-06	0.008	0.04	0.006	285	43	93	<0.005	200	1.1	10	8.36
16-Aug-06	0.014	0.046	0.015	325	210	150	<0.005	220	1.1	11	8.16
8-Sep-06	0.023	0.055	0.004	299	430	430	<0.005	220	1.4	17	8.21
02-Oct-6	0.014	0.058	0.013	307	93	93	0.038	220	1.5	20	8.11

**Whitemouth River #408**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E.Coli (CFU/100ml)	Fecal Coliform (CFU/100ml)	Nitrate+Nitrite-N Soluble (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended Solids (mg/L)	Ph (pH units)
24-Apr-06	0.008	0.028	0.011	156	<10	<10	n/a	120	0.7	35	8.18
18-May-06	0.012	0.03	0.01	167	20	30	0.009	120	0.7	9	8.2
16-Jun-06	0.022	0.053	0.013	222	40	90	<0.005	160	1	10	8.34
11-Jul-06	0.006	0.029	0.005	266	93	93	0.012	140	1.1	5	8.35
16-Aug-06	0.016	0.037	0.003	356	380	280	<0.005	230	0.9	<5	8.51
08-Sep.-06	0.02	0.052	0.006	312	1500	1500	<0.005	220	1.2	15	8.44
02-Oct.-6	0.016	0.042	0.009	346	430	430	<0.005		1.2	7	8.4

**Whitemouth River Kelner Drain 406**

Sample Date	Total Dissolved Phosphorous (mg/L)	Total Phosphorous (mg/L)	Ammonia Soluble (mg/L)	Conductivity umhos/cm	E. Coli (CFU/100ml)	Fecal Coliform (CFU100/ml)	Nitrate+Nitrite-N Soluble (mg/L)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Suspended (mg/L)	PH (pH units)
24-Apr-06	0.016	0.038	0.012	218	20	20	n/a	170	0.9	20	8.14
18-May-06	0.04	0.063	0.02	253	100	130	0.009	180	1.1	20	8.03
16-Jun-06	0.139	0.137	0.021	219	180	210	<0.005	180	1.4	33	8.12