City of Fort Wayne
River Survey 2005
St. Joseph River @ Tennessee Street

Wk	Date	Depth(ft)	ECOLI	DO	Temp(F)	pH	PHOS	NH3-N	TSS
1	04/04/05	12.09	19	12.45	47.5	6.76	0.20	0.020	7
2	04/11/05	11.74	20	10.84	57.3	7.27	0.08	0.020	14
3	04/18/05	8.39	40	12.45	57.8	7.84	0.06	0.100	28
4	04/25/05	12.74	387	12.29	47.1	6.62	0.01	0.030	16
5	05/02/05	11.11	70	12.49	51.0	6.62	0.09	0.020	14
6	05/09/05	8.50	18	11.18	62.8	7.46	0.08	0.020	13
7	05/18/05	8.89	110	9.93	59.0	7.56	0.10	0.100	25
8	05/23/05	9.38	111	6.45	62.4	8.06	0.10	0.020	22
9	05/31/05	7.94	192	5.54	65.5	8.23	0.05	0.026	20
10	06/06/05	7.11	5200	No Data	69.8	7.87	0.09	0.045	26
11	06/13/05	8.44	1986	No Data	76.7	7.48	0.10	0.103	8
12	06/20/05	6.96	109	8.01	69.7	8.03	0.09	0.100	24
13	06/27/05	10.53	50	14.38	82.3	8.37	0.02	0.020	8
14	07/05/05	6.59	87	5.41	76.7	7.85	0.05	0.002	18
15	07/11/05	5.05	157	6.02	77.5	7.82	0.16	0.002	32
16	07/18/05	10.73	210	7.08	78.5	8.13	0.13	0.002	20
17	07/25/05	11.21	34	9.78	81.9	7.98	0.13	0.100	12
18	08/01/05	10.94	99	6.07	76.1	7.88	0.14	0.148	38
19	08/08/05	10.14	921	8.41	79.9	8.66	0.09	0.100	14
20	08/15/05	6.51	249	No Data	77.6	7.78	0.14	0.100	11
21	08/22/05	10.70	140	7.44	77.3	7.93	0.11	0.100	17
22	08/29/05	10.17	45	7.20	76.5	8.18	0.11	0.100	14
23	09/06/05	10.50	35	8.79	73.5	7.92	0.26	0.421	12
24	09/13/05	10.43	14	12.71	75.8	8.16	0.11	0.100	13
25	09/19/05	10.89	28	8.58	70.1	8.00	0.10	0.100	8
26	09/26/05	11.54	1300	8.50	70.7	8.82	0.19	0.100	72
27	10/03/05	11.26	68	9.13	71.6	8.95	0.07	0.100	18
28	10/10/05	11.23	40	8.16	60.8	7.16	0.12	0.100	15
29	10/17/05	11.20	67	10.29	58.4	8.19	0.09	0.100	20
30	10/24/05	10.34	199	8.41	53.2	7.78	0.08	0.103	21
31	10/31/05	11.29	16	11.77	50.7	7.49	0.02	0.100	12
	Max.	12.74	5200	14.38	81.90	8.82	0.260	0.421	72
	Min.	5.05	14	5.41	47.10	6.62	0.01	0.002	7
	Avg.	9.82	388	9.28	67.60	7.83	0.10	0.081	19

E.Coli = colonies per 100 mls, yellow indicates >235
PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l, DO = Dissolved Oxygen mg/l
TSS = Total Suspended Solids mg/l

1215713v1

City of Fort Wayne
River Survey 2005
St. Marys River @ Spy Run Avenue

Wk	Date	Depth(ft)	ECOLI	DO	Temp(F)	pH	PHOS	NH3-N	TSS
1	04/04/05	9.51	345	11.51	45.9	6.47	0.21	0.038	46
2	04/11/05	9.16	61	11.45	58.3	7.09	0.23	0.020	44
3	04/18/05	6.12	35	22.31	60.9	7.78	0.13	0.100	49
4	04/25/05	10.43	6890	11.51	42.6	6.45	0.58	1.010	166
5	05/02/05	8.77	192	10.11	50.2	6.28	0.28	0.042	47
6	05/09/05	6.22	73	14.50	64.2	7.38	0.12	0.050	29
7	05/18/05	6.67	291	11.99	59.3	7.40	0.21	0.300	29
8	05/23/05	7.28	291	6.58	62.9	7.98	0.28	0.020	22
9	05/31/05	5.57	77	7.84	67.0	8.35	0.13	0.020	32
10	06/06/05	4.82	1733	7.57	73.6	7.80	0.13	0.020	44
11	06/13/05	6.05	46110	No Data	73.8	7.86	0.23	0.114	53
12	06/20/05	4.84	613	8.27	68.7	7.89	0.23	0.100	55
13	06/27/05	8.51	727	18.85	82.8	8.69	0.05	0.002	16
14	07/05/05	4.53	326	6.84	77.2	7.76	0.31	0.002	51
15	07/11/05	3.11	461	11.04	76.3	7.96	0.26	0.002	70
16	07/18/05	8.47	1120	No Data	77.7	7.59	0.16	0.002	19
17	07/25/05	8.68	118	5.95	83.8	8.39	0.36	0.100	19
18	08/01/05	9.20	344	7.75	77.0	8.48	0.21	0.025	31
19	08/08/05	8.20	37	7.91	81.1	8.56	0.23	0.147	24
20	08/15/05	8.31	866	5.44	76.3	7.57	0.26	0.200	18
21	08/22/05	8.64	365	8.04	78.2	7.91	0.14	0.100	21
22	08/29/05	8.26	50	6.11	76.9	8.16	0.18	0.100	19
23	09/06/05	8.56	59	5.91	70.9	7.59	0.42	0.015	37
24	09/13/05	8.34	17	10.81	74.7	7.96	0.14	0.100	16
25	09/19/05	8.54	194	11.54	69.6	8.30	0.23	0.200	22
26	09/26/05	9.45	>2420	5.80	68.1	7.20	0.26	0.114	68
27	10/03/05	9.10	345	7.19	63.1	7.26	0.37	0.100	84
28	10/10/05	8.76	161	7.81	58.9	6.95	0.20	0.100	29
29	10/17/05	8.95	111	9.38	57.7	7.78	0.19	0.100	31
30	10/24/05	8.37	115	9.43	52.9	7.69	0.19	0.100	30
31	10/31/05	8.58	93	10.36	47.1	6.96	0.29	0.100	36
	Max.	10.43	46110	22.31	83.8	8.69	0.580	1.010	166
	Min.	3.11	17	5.44	42.6	6.28	0.05	0.002	16
	Avg.	7.74	2007	9.65	67.0	7.66	0.23	0.111	40

E.Coli = colonies per 100 mls, yellow indicates >235

PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l, DO = Dissolved Oxygen mg/l

TSS = Total Suspended Solids mg/l

City of Fort Wayne
River Survey 2005
Maumee River @ Anthony Boulevard

Wk	Date	Depth(ft)	ECOLI	DO	Temp(F)	pH	PHOS	NH3-N	TSS
1	04/04/05	4.26	102	12.40	46.8	6.15	0.17	0.020	26
2	04/11/05	2.76	41	10.91	57.5	6.77	0.17	0.020	32
3	04/18/05	1.98	19	13.11	58.9	7.14	0.08	0.100	50
4	04/25/05	9.01	1733	12.14	43.2	6.43	0.58	0.898	154
5	05/02/05	3.95	145	10.89	50.4	6.11	0.30	0.028	39
6	05/09/05	2.13	40	12.78	62.5	6.92	0.08	0.020	26
7	05/18/05	2.18	179	9.60	59.0	7.10	0.14	0.100	40
8	05/23/05	2.65	152	5.79	62.7	7.79	0.18	0.020	32
9	05/31/05	1.59	50	5.49	66.3	8.57	0.13	0.024	38
10	06/06/05	1.64	4220	6.33	73.1	7.89	0.11	0.020	26
11	06/13/05	2.30	22820	No Data	75.8	7.81	0.12	0.061	27
12	06/20/05	1.74	345	8.64	70.4	8.00	0.15	0.100	50
13	06/27/05	1.06	96	10.02	78.6	7.77	0.07	0.085	12
14	07/05/05	1.37	365	7.54	77.6	7.69	0.01	0.002	39
15	07/11/05	0.89	76	10.82	77.9	7.69	0.19	0.002	34
16	07/18/05	1.45	548	6.43	78.9	7.89	0.14	0.002	24
17	07/25/05	1.40	105	5.43	83.3	8.09	0.15	0.100	17
18	08/01/05	1.97	260	6.01	76.7	7.49	0.15	0.154	40
19	08/08/05	0.90	45	6.08	78.2	7.83	0.11	0.184	17
20	08/15/05	1.27	2203	5.35	77.1	7.67	0.14	0.200	12
21	08/22/05	1.32	228	8.06	78.2	7.84	0.17	0.100	12
22	08/29/05	0.93	31	5.15	75.6	7.58	0.15	0.100	21
23	09/06/05	1.08	29	8.73	71.7	7.86	0.24	0.034	18
24	09/13/05	0.55	18	6.38	73.6	6.99	0.11	0.100	17
25	09/19/05	0.85	365	7.71	69.3	7.32	0.15	0.200	13
26	09/26/05	4.57	>2420	8.52	69.3	7.39	0.12	0.100	26
27	10/03/05	3.41	517	9.02	63.3	7.26	0.32	0.100	119
28	10/10/05	0.99	135	8.88	60.5	6.84	0.16	0.100	27
29	10/17/05	1.15	161	9.86	58.6	7.77	0.11	0.100	28
30	10/24/05	0.62	>2420	9.22	54.6	7.41	0.14	0.176	34
31	10/31/05	1.50	54	11.43	47.5	6.99	0.27	0.100	35
	Max.	9.01	22820	13.11	83.3	8.57	0.580	0.898	154
	Min.	0.55	18	5.15	43.2	6.11	0.01	0.002	12
	Avg.	2.05	1132	8.62	67.0	7.42	0.16	0.108	35

E.Coli = colonies per 100 mls, yellow indicates >235
PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l, DO = Dissolved Oxygen mg/l
TSS = Total Suspended Solids mg/l

City of Fort Wayne
River Survey 2005
Maumee River @ Landin Road

Wk	Date	Depth(ft)	ECOLI	DO	Temp(F)	pH	PHOS	NH3-N	TSS
1	04/04/05	7.68	84	12.35	47.7	6.98	0.17	0.243	24
2	04/11/05	6.74	47	10.93	57.2	7.27	0.17	0.026	35
3	04/18/05	5.90	13	14.94	60.4	7.91	0.14	0.100	46
4	04/25/05	12.59	4430	11.95	43.7	6.96	0.56	0.961	184
5	05/02/05	7.74	111	11.08	50.6	7.03	0.26	0.034	44
6	05/09/05	6.09	23	12.84	62.3	7.47	0.18	0.020	24
7	05/18/05	6.30	435	10.52	60.0	7.58	0.16	0.100	40
8	05/23/05	6.60	238	5.49	63.4	8.04	0.17	0.020	36
9	05/31/05	5.43	40	No Data	66.6	8.29	0.12	0.022	32
10	06/06/05	5.35	345	5.68	72.5	7.89	0.25	0.020	38
11	06/13/05	6.40	10760	No Data	75.4	7.67	0.11	0.132	28
12	06/20/05	4.97	192	9.05	70.5	7.98	0.18	0.100	34
13	06/27/05	4.30	61	8.74	79.9	7.93	0.07	0.036	16
14	07/05/05	5.02	144	6.53	77.4	7.81	0.05	0.021	21
15	07/11/05	4.06	84	10.99	78.3	8.04	0.18	0.002	32
16	07/18/05	5.71	866	5.69	78.0	7.83	0.27	0.002	28
17	07/25/05	5.08	261	8.67	82.8	7.68	0.38	0.100	14
18	08/01/05	5.51	488	5.48	75.9	7.57	0.19	0.167	43
19	08/08/05	3.83	178	6.12	79.5	7.51	0.15	0.191	18
20	08/15/05	4.87	1986	5.09	75.7	7.42	0.39	0.200	12
21	08/22/05	4.08	308	6.59	76.1	7.42	0.18	0.295	14
22	08/29/05	4.45	147	6.99	75.6	7.52	0.21	0.165	30
23	09/06/05	4.37	138	6.49	72.8	7.63	0.25	0.098	29
24	09/13/05	4.13	126	6.02	74.0	7.22	0.28	0.100	32
25	09/19/05	4.30	517	6.25	69.7	7.25	0.19	0.200	21
26	09/26/05	8.11	>2420	5.99	69.1	7.41	0.34	0.195	66
27	10/03/05	6.71	387	8.56	63.9	7.51	0.39	0.100	76
28	10/10/05	4.71	166	8.29	60.7	7.32	0.25	0.130	26
29	10/17/05	4.54	82	9.22	58.0	7.82	0.17	0.100	19
30	10/24/05	4.41	727	9.28	53.7	7.67	0.13	0.268	26
31	10/31/05	5.65	91	10.79	48.5	7.39	0.29	0.100	43
	Max.	12.59	10760	14.94	82.8	8.29	0.560	0.961	184
	Min.	3.83	13	5.09	43.7	6.96	0.05	0.002	12
	Avg.	5.66	757	8.50	67.1	7.58	0.220	0.137	36

E.Coli = colonies per 100 mls, yellow indicates >235
PHOS = Total Phosphorus mg/l, NH3-N = Ammonia-Nitrogen mg/l, DO = Dissolved Oxygen mg/l
TSS = Total Suspended Solids mg/l

1215713v1

City of Fort Wayne
River Survey 2006
St. Joseph River @ Tennessee Street

Wk	Date	Depth(ft)	pH	DO	Temp(F)	ECOLI	NH3-N	PHOS	TSS
1	04/03/06	11.56	7.25	12.19	50.28	517	0.05	0.05	30
2	04/10/06	10.66	7.43	11.51	51.09	70	0.05	0.11	42
3	04/17/06	12.9	7.48	10.40	60.07	866	0.05	0.10	28
4	04/24/06	9.92	7.51	9.69	60.61	100	0.05	0.14	37
5	05/01/06	8.48	7.43	9.67	57.68	308	0.05	0.18	28
6	05/08/06	9.32	8.07	10.45	62.44	45	0.05	0.31	28
7	05/15/06	13.97	7.38	10.60	52.80	687	0.24	0.29	54
8	05/22/06	12.78	7.47	10.28	59.29	86	0.05	0.12	46
9	05/30/06	11.02	7.99	9.65	73.64	86	0.05	0.03	21
10	06/05/06	11.14	7.21	8.80	68.74	184	0.05	0.06	28
11	06/12/06	10.97	7.49	8.65	67.46	126	0.05	0.06	20
12	06/19/06	10.81	7.61	6.84	73.81	228	0.05	0.90	16
13	06/26/06	11.54	7.28	7.51	74.57	122	0.05	0.19	34
14	07/06/06	10.89	7.91	9.88	73.45	66	0.05	0.25	31
15	07/10/06	11.48	7.36	7.53	74.55	45	0.05	0.10	42
16	07/17/06	12.56	7.12	8.16	76.76	372	0.05	0.21	59
17	07/24/06	10.19	7.56	7.48	75.88	96	0.05	0.14	24
18	07/31/06	11.35	7.49	7.74	78.00	488	0.05	0.19	35
19	08/07/06	8.29	7.19	7.10	78.86	81	0.05	0.16	40
20	08/14/06	5.24	7.84	6.66	73.73	58	0.05	0.21	27
21	08/21/06	6.92	7.91	7.37	73.73	365	0.05	0.13	18
22	08/28/06	4.19	7.67	6.27	75.03	240	0.05	0.09	33
23	09/05/06	6.50	7.27	8.64	69.15	133	0.05	0.08	23
24	09/11/06	5.62	7.53	8.96	67.34	201	0.05	0.16	35
25	09/18/06	7.61	7.60	8.06	68.09	3000	0.05	0.10	36
26	09/26/06	10.75	7.80	11.27	61.14	261	0.05	0.10	31
27	10/02/06	11.48	7.50	10.99	60.40	2420	0.05	0.16	29
28	10/09/06	11.13	7.17	9.58	57.94	205	0.05	0.62	34
29	10/16/06	11.44	7.08	11.55	49.70	411	0.05	0.15	52
30	10/23/06	12.30	6.87	11.03	49.20	36	0.05	0.19	46
	Max.	13.97	8.07	12.19	78.86	3000	0.24	0.90	59
	Min.	4.19	6.87	6.27	49.20	36	0.05	0.03	16
	Avg.	10.10	7.48	9.15	65.85	397	0.06	0.18	34

DO = Dissolved Oxygen mg/l, E.Coli = colonies per 100 mls (yellow indicates >235)
NH3-N = Ammonia Nitrogen mg/l, PHOS = Total Phosphorus mg/l
TSS = Total Suspended Solids mg/l

1215713v1

City of Fort Wayne
River Survey 2006
St. Marys River @ Spy Run Avenue

Wk	Date	Depth(ft)	pH	DO	Temp(F)	ECOLI	NH3-N	PHOS	TSS
1	04/03/06	9.24	7.07	10.46	49.92	11530	0.29	0.68	368
2	04/10/06	8.15	7.37	10.77	52.64	201	0.05	0.21	56
3	04/17/06	11.04	6.80	8.11	56.60	16160	0.20	0.70	312
4	04/24/06	7.84	7.07	8.10	60.17	100	0.05	0.21	60
5	05/01/06	6.36	7.32	12.77	56.16	4080	0.35	0.58	53
6	05/08/06	8.91	7.88	13.21	61.33	99	0.05	0.33	40
7	05/15/06	11.71	7.35	9.38	53.08	6400	0.33	0.34	194
8	05/22/06	10.19	7.22	8.95	57.23	166	0.05	0.28	92
9	05/30/06	8.66	7.66	6.77	72.06	816	0.05	0.11	70
10	06/05/06	8.92	7.12	7.03	65.70	866	0.05	0.25	105
11	06/12/06	8.47	7.29	7.61	63.47	1553	0.38	0.62	120
12	06/19/06	9.16	7.56	7.43	73.54	758	0.05	0.21	40
13	06/26/06	9.18	7.19	5.88	73.15	365	0.15	0.30	54
14	07/06/06	8.78	7.92	13.61	74.09	210	0.05	0.23	37
15	07/10/06	9.18	7.18	12.11	76.15	88	0.05	0.10	66
16	07/17/06	10.49	6.92	5.94	78.88	548	0.05	0.28	65
17	07/24/06	8.33	7.06	6.07	75.65	488	0.05	0.31	63
18	07/31/06	9.16	7.21	6.03	79.15	548	0.05	0.33	48
19	08/07/06	5.99	6.58	5.92	78.97	649	0.05	0.36	100
20	08/14/06	3.46	7.53	5.84	72.96	228	0.05	0.34	61
21	08/21/06	4.56	7.62	3.60	74.48	613	0.20	0.30	35
22	08/28/06	4.60	7.45	4.10	75.35	1986	0.05	0.13	60
23	09/05/06	4.58	7.11	5.52	67.42	1414	0.15	0.34	99
24	09/11/06	3.70	7.27	6.17	67.16	435	0.13	0.30	80
25	09/18/06	5.05	7.34	6.82	68.47	81640	0.20	0.28	62
26	09/26/06	8.57	7.69	11.86	61.45	816	0.05	0.21	38
27	10/02/06	9.05	7.32	12.77	59.47	2420	0.05	0.29	20
28	10/09/06	8.87	7.17	9.95	57.11	261	0.05	0.11	30
29	10/16/06	9.24	7.11	7.85	49.00	82	0.05	0.25	8
30	10/23/06	9.85	6.74	8.17	49.90	248	0.05	0.54	52
	Max.	11.71	7.88	13.61	79.15	81640	0.38	0.70	368
	Min.	3.46	6.58	3.60	49.00	82	0.05	0.10	8
	Avg.	8.04	7.27	8.29	65.36	4526	0.11	0.32	83

DO = Dissolved Oxygen mg/l, E.Coli = colonies per 100 mls (yellow indicates >235)
NH3-N = Ammonia Nitrogen mg/l, PHOS = Total Phosphorus mg/l
TSS = Total Suspended Solids mg/l
Low DOs are associated with oil in groundwater from the NIPSCO site on Superior Street.

1215713v1

City of Fort Wayne
River Survey 2006
Maumee River @ Anthony Boulevard

Wk	Date	Depth(ft)	pH	DO	Temp(F)	ECOLI	NH3-N	PHOS	TSS
1	04/03/06	5.01	7.03	11.84	50.29	8690	0.17	0.37	200
2	04/10/06	3.17	7.08	11.24	51.83	107	0.05	0.18	50
3	04/17/06	9.69	6.69	9.23	57.67	12740	0.20	0.64	290
4	04/24/06	3.01	6.88	8.97	61.22	100	0.05	0.20	52
5	05/01/06	1.67	7.26	10.82	57.40	1986	0.05	0.20	46
6	05/08/06	1.63	7.72	11.27	62.71	55	0.05	0.33	36
7	05/15/06	10.97	7.29	10.40	53.00	3495	0.29	0.21	77
8	05/22/06	6.04	7.12	10.74	58.88	122	0.05	0.20	97
9	05/30/06	3.69	7.81	8.30	72.91	649	0.05	0.03	40
10	06/05/06	4.15	7.09	8.29	67.63	579	0.05	0.19	79
11	06/12/06	3.39	7.33	8.65	65.20	613	0.15	0.17	65
12	06/19/06	1.74	7.42	8.35	73.79	649	0.05	0.14	35
13	06/26/06	2.18	7.53	8.30	75.48	248	0.05	0.23	52
14	07/06/06	1.53	7.67	10.00	73.94	99	0.05	0.21	30
15	07/10/06	1.79	6.84	8.03	75.21	70	0.05	0.16	49
16	07/17/06	6.32	7.10	8.59	77.59	435	0.05	0.20	61
17	07/24/06	2.91	7.10	7.76	76.55	172	0.05	0.23	57
18	07/31/06	4.05	7.45	7.47	78.03	378	0.05	0.23	57
19	08/07/06	2.09	6.62	6.54	78.97	172	0.05	0.24	67
20	08/14/06	1.16	7.54	8.03	75.63	73	0.05	0.16	47
21	08/21/06	1.37	8.01	7.49	75.11	866	0.05	0.17	48
22	08/28/06	1.57	7.53	6.62	76.33	2420	0.05	0.17	50
23	09/05/06	1.20	7.19	7.23	67.40	816	0.05	0.28	67
24	09/11/06	0.66	7.21	7.70	68.46	345	0.05	0.15	54
25	09/18/06	1.16	7.23	8.11	69.19	15650	0.05	0.20	46
26	09/26/06	1.44	7.58	9.93	61.18	150	0.05	0.12	33
27	10/02/06	4.68	7.29	10.64	60.15	2420	0.05	0.30	28
28	10/09/06	1.95	7.36	10.24	57.88	210	0.05	0.10	44
29	10/16/06	4.38	7.00	11.80	48.10	152	0.05	0.12	50
30	10/23/06	5.58	6.48	10.71	49.90	249	0.05	0.47	59
	Max.	10.97	8.01	11.84	78.97	15650	0.29	0.64	290
	Min.	1.16	6.48	6.54	48.10	55	0.05	0.03	28
	Avg.	3.34	7.25	9.11	65.92	1824	0.07	0.22	66

DO = Dissolved Oxygen mg/l, E.Coli = colonies per 100 mls (yellow indicates >235)
NH3-N = Ammonia Nitrogen mg/l, PHOS = Total Phosphorus mg/l
TSS = Total Suspended Solids mg/l

1215713v1

City of Fort Wayne
River Survey 2006
Maumee River @ Landin Road

Wk	Date	Depth(ft)	pH	DO	Temp(F)	ECOLI	NH3-N	PHOS	TSS
1	04/03/06	9.34	7.31	10.90	50.66	14140	0.21	0.45	172
2	04/10/06	7.10	7.30	10.86	51.53	127	0.05	0.18	54
3	04/17/06	13.37	7.27	8.98	58.11	4200	0.20	0.66	298
4	04/24/06	7.07	7.53	8.99	61.23	100	0.05	0.20	54
5	05/01/06	5.84	7.34	10.68	57.85	1300	0.05	0.31	45
6	05/08/06	5.33	7.93	10.30	61.58	44	0.05	0.33	38
7	05/15/06	14.58	7.29	10.10	53.15	3310	0.34	0.31	136
8	05/22/06	9.66	7.43	10.26	58.96	127	0.05	0.24	89
9	05/30/06	7.57	7.74	8.15	72.93	118	0.05	0.07	43
10	06/05/06	7.94	7.16	8.10	68.32	687	0.05	0.15	82
11	06/12/06	7.41	7.41	8.19	65.70	727	0.05	0.47	60
12	06/19/06	5.84	7.56	6.94	72.51	272	0.05	0.19	36
13	06/26/06	6.53	7.31	7.19	74.24	225	0.05	0.03	45
14	07/06/06	4.81	7.57	8.00	72.14	119	0.11	0.32	30
15	07/10/06	5.55	7.25	6.78	75.61	60	0.05	0.31	47
16	07/17/06	9.81	7.05	7.78	78.31	308	0.05	0.27	78
17	07/24/06	6.54	7.27	7.37	75.35	142	0.05	0.22	42
18	07/31/06	8.06	7.29	7.06	78.41	435	0.05	0.24	54
19	08/07/06	6.02	6.98	6.73	79.33	161	0.05	0.25	59
20	08/14/06	4.63	7.37	6.52	74.36	130	0.05	0.19	43
21	08/21/06	5.07	7.81	6.07	74.34	365	0.05	0.22	33
22	08/28/06	5.45	7.47	5.10	75.26	2420	0.13	0.14	39
23	09/05/06	4.70	7.08	7.20	67.60	548	0.10	0.23	54
24	09/11/06	4.78	7.09	6.52	67.48	238	0.10	0.23	36
25	09/18/06	5.32	7.42	7.65	69.13	2420	0.05	0.22	45
26	09/26/06	5.14	7.56	10.32	60.87	261	0.05	0.17	45
27	10/02/06	5.25	7.09	9.12	61.59	2420	0.05	0.28	38
28	10/09/06	5.60	6.87	9.51	57.85	194	0.05	1.17	44
29	10/16/06	7.77	7.29	11.65	48.90	313	0.05	0.16	70
30	10/23/06	9.15	6.70	10.51	50.10	236	0.05	0.44	65
	Max.	14.58	7.93	10.90	79.33	14140	0.34	1.17	298
	Min.	4.63	6.70	5.10	48.90	44	0.05	0.03	30
	Avg.	7.04	7.32	8.45	65.78	1205	0.08	0.29	66

DO = Dissolved Oxygen mg/l, E.Coli = colonies per 100 mls (yellow indicates >235)
NH3-N = Ammonia Nitrogen mg/l, PHOS = Total Phosphorus mg/l
TSS = Total Suspended Solids mg/l

Jim Cornell Feb 2007

1215713v1

APPENDIX G: Data Set for St. Joseph River @ Tennessee Avenue

Box and Whiskers Graph

St. Joseph @ Tennessee Avenue - 1970s Fecal Coliform		St. Joseph @ Tennessee Avenue - 1980s Fecal Coliform		St. Joseph @ Tennessee Avenue - 1990s E. Coli		St. Joseph @ Tennessee Avenue - 2000s E. Coli		
Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
280	Coliforn	180	Coliforn	2400	E. coli (	60	E. coli (	235 cfu/100 mL
170	Coliforn	140	Coliforn	70	E. coli (	50	E. coli (	235 cfu/100 mL
30	Coliforn	290	Coliforn	1300	E. coli (	220	E. coli (	235 cfu/100 mL
320	Coliforn	1200	Coliforn	60	E. coli (	260	E. coli (	235 cfu/100 mL
100	Coliforn	10	Coliforn	900	E. coli (	110	E. coli (	235 cfu/100 mL
120	Coliforn	1600	Coliforn	230	E. coli (	140	E. coli (	235 cfu/100 mL
1200	Coliforn	440	Coliforn	190	E. coli (	20	E. coli (	235 cfu/100 mL
710	Coliforn	2000	Coliforn	500	E. coli (	48	E. coli (	235 cfu/100 mL
220	Coliforn	2900	Coliforn	10000	E. coli (	32	E. coli (	235 cfu/100 mL
220	Coliforn	2000	Coliforn	1100	E. coli (	500	E. coli (	235 cfu/100 mL
10	Coliforn	40	Coliforn	150	E. coli (	540	E. coli (	235 cfu/100 mL
150	Coliforn	240	Coliforn	240	E. coli (	370	E. coli (	235 cfu/100 mL
100	Coliforn	350	Coliforn	290	E. coli (	100	E. coli (	235 cfu/100 mL
760	Coliforn	210	Coliforn	700	E. coli (	100	E. coli (	235 cfu/100 mL
1000	Coliforn	72	Coliforn	200	E. coli (	200	E. coli (	235 cfu/100 mL
100	Coliforn	4400	Coliforn	90	E. coli (	144	E. coli (	235 cfu/100 mL
360	Coliforn	1800	Coliforn	180	E. coli (	100	E. coli (	235 cfu/100 mL
130	Coliforn	130	Coliforn	150	E. coli (	20	E. coli (	235 cfu/100 mL
2900	Coliforn	30	Coliforn	400	E. coli (	80	E. coli (	235 cfu/100 mL
210	Coliforn	1900	Coliforn	200	E. coli (	44	E. coli (	235 cfu/100 mL
120	Coliforn	660	Coliforn	300	E. coli (	102	E. coli (	235 cfu/100 mL
10	Coliforn	110	Coliforn	90	E. coli (	102	E. coli (	235 cfu/100 mL
70	Coliforn	18000	Coliforn	120	E. coli (	480	E. coli (	235 cfu/100 mL
610	Coliforn	100	Coliforn	10	E. coli (	450	E. coli (	235 cfu/100 mL
70	Coliforn	250	Coliforn	20	E. coli (	210	E. coli (	235 cfu/100 mL
30	Coliforn	40	Coliforn	170	E. coli (	1120	E. coli (	235 cfu/100 mL
2600	Coliforn	270	Coliforn	410	E. coli (	160	E. coli (	235 cfu/100 mL
400	Coliforn	50	Coliforn	1700	E. coli (	360	E. coli (	235 cfu/100 mL
570	Coliforn	490	Coliforn	480	E. coli (	180	E. coli (	235 cfu/100 mL
80	Coliforn	890	Coliforn	60	E. coli (	550	E. coli (	235 cfu/100 mL
150	Coliforn	430	Coliforn	100	E. coli (	3200	E. coli (	235 cfu/100 mL
420	Coliforn	190	Coliforn	880	E. coli (	270	E. coli (	235 cfu/100 mL
3200	Coliforn	200	Coliforn	20	E. coli (	180	E. coli (	235 cfu/100 mL
150	Coliforn	140	Coliforn	120	E. coli (	544	E. coli (	235 cfu/100 mL
870	Coliforn	10	Coliforn	80	E. coli (	320	E. coli (	235 cfu/100 mL
40	Coliforn	380	Coliforn	50	E. coli (	220	E. coli (	235 cfu/100 mL
290	Coliforn	1600	Coliforn	290	E. coli (	200	E. coli (	235 cfu/100 mL
		30	Coliforn	28000	E. coli (	360	E. coli (	235 cfu/100 mL
		120	Coliforn	300	E. coli (	100	E. coli (	235 cfu/100 mL
		330	Coliforn	20	E. coli (	5600	E. coli (	235 cfu/100 mL

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
		800	Coliforn	250	E. coli (	100	E. coli (	235 cfu/100 mL
		540	Coliforn	690	E. coli (	100	E. coli (	235 cfu/100 mL
		250	Coliforn	330	E. coli (	140	E. coli (	235 cfu/100 mL
		120	Coliforn	250	E. coli (	290	E. coli (	235 cfu/100 mL
		590	Coliforn	10	E. coli (	140	E. coli (	235 cfu/100 mL
		10	Coliforn	450	E. coli (	240	E. coli (	235 cfu/100 mL
		30	Coliforn	110	E. coli (	240	E. coli (	235 cfu/100 mL
		10	Coliforn	120	E. coli (	210	E. coli (	235 cfu/100 mL
		750	Coliforn	1800	E. coli (	220	E. coli (	235 cfu/100 mL
		750	Coliforn	520	E. coli (	150	E. coli (	235 cfu/100 mL
		460	Coliforn	110	E. coli (	80	E. coli (	235 cfu/100 mL
		100	Coliforn	940	E. coli (	50	E. coli (	235 cfu/100 mL
		5000	Coliforn	4000	E. coli (	245	E. coli (	235 cfu/100 mL
		130	Coliforn	230	E. coli (	980	E. coli (	235 cfu/100 mL
		600	Coliforn	230	E. coli (	210	E. coli (	235 cfu/100 mL
		2000	Coliforn	10000	E. coli (	70	E. coli (	235 cfu/100 mL
		110	Coliforn	1600	E. coli (	50	E. coli (	235 cfu/100 mL
		250	Coliforn	2800	E. coli (	30	E. coli (	235 cfu/100 mL
		1900	Coliforn	60	E. coli (	320	E. coli (	235 cfu/100 mL
		90	Coliforn	80	E. coli (	415	E. coli (	235 cfu/100 mL
		220	Coliforn	90	E. coli (	100	E. coli (	235 cfu/100 mL
		40	Coliforn	890	E. coli (	10	E. coli (	235 cfu/100 mL
		11	Coliforn	230	E. coli (	75	E. coli (	235 cfu/100 mL
		750	Coliforn	220	E. coli (	150	E. coli (	235 cfu/100 mL
		150	Coliforn	10	E. coli (	8	E. coli (	235 cfu/100 mL
		600	Coliforn	4000	E. coli (	34	E. coli (	235 cfu/100 mL
		210	Coliforn	1800	E. coli (	5	E. coli (	235 cfu/100 mL
		500	Coliforn	930	E. coli (	3	E. coli (	235 cfu/100 mL
		110	Coliforn	20	E. coli (	12	E. coli (	235 cfu/100 mL
		4600	Coliforn	50	E. coli (	700	E. coli (	235 cfu/100 mL
		40	Coliforn	360	E. coli (	78	E. coli (	235 cfu/100 mL
		680	Coliforn	160	E. coli (	76	E. coli (	235 cfu/100 mL
		200	Coliforn	200	E. coli (	38	E. coli (	235 cfu/100 mL
		10	Coliforn	6600	E. coli (	80	E. coli (	235 cfu/100 mL
		300	Coliforn	10	E. coli (	130	E. coli (	235 cfu/100 mL
		470	Coliforn	160	E. coli (	40	E. coli (	235 cfu/100 mL
		190	Coliforn	200	E. coli (	190	E. coli (	235 cfu/100 mL
		10	Coliforn	30	E. coli (	360	E. coli (	235 cfu/100 mL
		150	Coliforn	20	E. coli (	500	E. coli (	235 cfu/100 mL
		100	Coliforn	390	E. coli (	440	E. coli (	235 cfu/100 mL
		60	Coliforn	360	E. coli (	60	E. coli (	235 cfu/100 mL
		800	Coliforn	120	E. coli (	640	E. coli (	235 cfu/100 mL
		2000	Coliforn	40	E. coli (	120	E. coli (	235 cfu/100 mL
		190	Coliforn	440	E. coli (	54	E. coli (	235 cfu/100 mL
		400	Coliforn	110	E. coli (	20	E. coli (	235 cfu/100 mL
				10	E. coli (	8	E. coli (	235 cfu/100 mL
				40	E. coli (	96	E. coli (	235 cfu/100 mL
				80	E. coli (	92	E. coli (	235 cfu/100 mL
				230	E. coli (	92	E. coli (	235 cfu/100 mL

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
				140	E. coli (	184	E. coli	(235 cfu/100 mL
				10	E. coli (	104	E. coli	(235 cfu/100 mL
				970	E. coli (	20	E. coli	(235 cfu/100 mL
				800	E. coli (	23	E. coli	(235 cfu/100 mL
				300	E. coli (	20	E. coli	(235 cfu/100 mL
				110	E. coli (	21	E. coli	(235 cfu/100 mL
				7900	E. coli (	14	E. coli	(235 cfu/100 mL
				110	E. coli (	36	E. coli	(235 cfu/100 mL
				20	E. coli (	1454	E. coli	(235 cfu/100 mL
				80	E. coli (	238	E. coli	(235 cfu/100 mL
				180	E. coli (	93	E. coli	(235 cfu/100 mL
				50	E. coli (	9680	E. coli	(235 cfu/100 mL
				370	E. coli (	6520	E. coli	(235 cfu/100 mL
						218	E. coli	(235 cfu/100 mL
						3309	E. coli	(235 cfu/100 mL
						126	E. coli	(235 cfu/100 mL
						190	E. coli	(235 cfu/100 mL
						20	E. coli	(235 cfu/100 mL
						1288	E. coli	(235 cfu/100 mL
						85	E. coli	(235 cfu/100 mL
						320	E. coli	(235 cfu/100 mL
						82	E. coli	(235 cfu/100 mL
						104	E. coli	(235 cfu/100 mL
						190	E. coli	(235 cfu/100 mL
						1488	E. coli	(235 cfu/100 mL
						840	E. coli	(235 cfu/100 mL
						82	E. coli	(235 cfu/100 mL
						85	E. coli	(235 cfu/100 mL
						66	E. coli	(235 cfu/100 mL
						110	E. coli	(235 cfu/100 mL
						58	E. coli	(235 cfu/100 mL
						39	E. coli	(235 cfu/100 mL
						613	E. coli	(235 cfu/100 mL
						19	E. coli	(235 cfu/100 mL
						20	E. coli	(235 cfu/100 mL
						40	E. coli	(235 cfu/100 mL
						387	E. coli	(235 cfu/100 mL
						70	E. coli	(235 cfu/100 mL
						18	E. coli	(235 cfu/100 mL
						110	E. coli	(235 cfu/100 mL
						111	E. coli	(235 cfu/100 mL
						192	E. coli	(235 cfu/100 mL
						5200	E. coli	(235 cfu/100 mL
						1986	E. coli	(235 cfu/100 mL
						109	E. coli	(235 cfu/100 mL
						50	E. coli	(235 cfu/100 mL
						87	E. coli	(235 cfu/100 mL
						157	E. coli	(235 cfu/100 mL
						210	E. coli	(235 cfu/100 mL

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
						34	E. coli	(235 cfu/100 mL
						99	E. coli	(235 cfu/100 mL
						921	E. coli	(235 cfu/100 mL
						249	E. coli	(235 cfu/100 mL
						140	E. coli	(235 cfu/100 mL
						45	E. coli	(235 cfu/100 mL
						35	E. coli	(235 cfu/100 mL
						14	E. coli	(235 cfu/100 mL
						28	E. coli	(235 cfu/100 mL
						1300	E. coli	(235 cfu/100 mL
						68	E. coli	(235 cfu/100 mL
						40	E. coli	(235 cfu/100 mL
						67	E. coli	(235 cfu/100 mL
						199	E. coli	(235 cfu/100 mL
						16	E. coli	(235 cfu/100 mL
						517	E. coli	(235 cfu/100 mL
						70	E. coli	(235 cfu/100 mL
						866	E. coli	(235 cfu/100 mL
						100	E. coli	(235 cfu/100 mL
						308	E. coli	(235 cfu/100 mL
						45	E. coli	(235 cfu/100 mL
						687	E. coli	(235 cfu/100 mL
						86	E. coli	(235 cfu/100 mL
						86	E. coli	(235 cfu/100 mL
						184	E. coli	(235 cfu/100 mL
						126	E. coli	(235 cfu/100 mL
						228	E. coli	(235 cfu/100 mL
						122	E. coli	(235 cfu/100 mL
						66	E. coli	(235 cfu/100 mL
						45	E. coli	(235 cfu/100 mL
						372	E. coli	(235 cfu/100 mL
						96	E. coli	(235 cfu/100 mL
						488	E. coli	(235 cfu/100 mL
						81	E. coli	(235 cfu/100 mL
						58	E. coli	(235 cfu/100 mL
						365	E. coli	(235 cfu/100 mL
						240	E. coli	(235 cfu/100 mL
						133	E. coli	(235 cfu/100 mL
						201	E. coli	(235 cfu/100 mL
						3000	E. coli	(235 cfu/100 mL
						261	E. coli	(235 cfu/100 mL
						2420	E. coli	(235 cfu/100 mL
						205	E. coli	(235 cfu/100 mL
						411	E. coli	(235 cfu/100 mL
						36	E. coli	(235 cfu/100 mL

Summary Range				
	St. Joseph @ Tennessee Avenue - 1970s	St. Joseph @ Tennessee Avenue - 1980s	St. Joseph @ Tennessee Avenue - 1990s	St. Joseph @ Tennessee Avenue - 2000s
Minimum:	10	10	10	3
5th Percentile:	26	10	11	18
25th Percentile:	100	110	83	60
Median:	210	250	200	120
75th Percentile:	570	680	495	280
95th Percentile:	2,660	2,720	4,000	1,485
Maximum:	3,200	18,000	28,000	9,680

Chart Data				
	St. Joseph @ Tennessee Avenue - 1970s Fecal Coliform	St. Joseph @ Tennessee Avenue - 1980s Fecal Coliform	St. Joseph @ Tennessee Avenue - 1990s E. Coli	St. Joseph @ Tennessee Avenue - 2000s E. Coli
Series 1	10	10	10	3
Series 2	16	-	1	15
Series 3	74	100	72	42
Series 4	110	140	118	60
Series 5	360	430	295	160
Series 6	2,090	2,040	3,505	1,205
Series 7	540	15,280	24,000	8,195

APPENDIX H: Data Set for St. Marys River @ Spy Run

Box and Whiskers Graph

St. Marys @ Spy Run - 1980s Fecal Coliform		St. Marys @ Spy Run - 1990s E. Coli		St. Marys @ Spy Run - 2000s E. Coli		
Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
2500	Coliforn	2400	E. coli (	970	E. coli	(235 cfu/100 mL)
930	Coliforn	600	E. coli (	870	E. coli	(235 cfu/100 mL)
2700	Coliforn	16000	E. coli (	1600	E. coli	(235 cfu/100 mL)
4800	Coliforn	30	E. coli (	600	E. coli	(235 cfu/100 mL)
800	Coliforn	30000	E. coli (	1200	E. coli	(235 cfu/100 mL)
5700	Coliforn	540	E. coli (	900	E. coli	(235 cfu/100 mL)
800	Coliforn	530	E. coli (	70	E. coli	(235 cfu/100 mL)
29000	Coliforn	240	E. coli (	32	E. coli	(235 cfu/100 mL)
1700	Coliforn	18000	E. coli (	90	E. coli	(235 cfu/100 mL)
4900	Coliforn	2300	E. coli (	520	E. coli	(235 cfu/100 mL)
1300	Coliforn	200	E. coli (	600	E. coli	(235 cfu/100 mL)
5000	Coliforn	470	E. coli (	1480	E. coli	(235 cfu/100 mL)
10	Coliforn	600	E. coli (	2920	E. coli	(235 cfu/100 mL)
340	Coliforn	500	E. coli (	1000	E. coli	(235 cfu/100 mL)
940	Coliforn	2900	E. coli (	848	E. coli	(235 cfu/100 mL)
10	Coliforn	1600	E. coli (	450	E. coli	(235 cfu/100 mL)
10000	Coliforn	1700	E. coli (	3000	E. coli	(235 cfu/100 mL)
1600	Coliforn	130	E. coli (	260	E. coli	(235 cfu/100 mL)
3600	Coliforn	700	E. coli (	3000	E. coli	(235 cfu/100 mL)
80	Coliforn	1300	E. coli (	1450	E. coli	(235 cfu/100 mL)
12000	Coliforn	440	E. coli (	500	E. coli	(235 cfu/100 mL)
440	Coliforn	260	E. coli (	360	E. coli	(235 cfu/100 mL)
100	Coliforn	40	E. coli (	4600	E. coli	(235 cfu/100 mL)
8800	Coliforn	200	E. coli (	4000	E. coli	(235 cfu/100 mL)
8300	Coliforn	240	E. coli (	700	E. coli	(235 cfu/100 mL)
3000	Coliforn	1900	E. coli (	4250	E. coli	(235 cfu/100 mL)
230	Coliforn	2500	E. coli (	1160	E. coli	(235 cfu/100 mL)
		4600	E. coli (	6000	E. coli	(235 cfu/100 mL)
		700	E. coli (	600	E. coli	(235 cfu/100 mL)
		290	E. coli (	620	E. coli	(235 cfu/100 mL)
		1600	E. coli (	3000	E. coli	(235 cfu/100 mL)
		1000	E. coli (	1800	E. coli	(235 cfu/100 mL)
		120	E. coli (	380	E. coli	(235 cfu/100 mL)
		1800	E. coli (	884	E. coli	(235 cfu/100 mL)
		2900	E. coli (	740	E. coli	(235 cfu/100 mL)
		350	E. coli (	660	E. coli	(235 cfu/100 mL)
		600	E. coli (	680	E. coli	(235 cfu/100 mL)
		3500	E. coli (	3740	E. coli	(235 cfu/100 mL)
		1200	E. coli (	1000	E. coli	(235 cfu/100 mL)
		40	E. coli (	5400	E. coli	(235 cfu/100 mL)
		450	E. coli (	500	E. coli	(235 cfu/100 mL)
		840	E. coli (	2700	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
		370	E. coli (	560	E. coli	(235 cfu/100 mL)
		580	E. coli (	1400	E. coli	(235 cfu/100 mL)
		50	E. coli (	420	E. coli	(235 cfu/100 mL)
		490	E. coli (	360	E. coli	(235 cfu/100 mL)
		1900	E. coli (	220	E. coli	(235 cfu/100 mL)
		1500	E. coli (	300	E. coli	(235 cfu/100 mL)
		540	E. coli (	380	E. coli	(235 cfu/100 mL)
		370	E. coli (	170	E. coli	(235 cfu/100 mL)
		60	E. coli (	270	E. coli	(235 cfu/100 mL)
		20000	E. coli (	740	E. coli	(235 cfu/100 mL)
		220	E. coli (	55	E. coli	(235 cfu/100 mL)
		4300	E. coli (	130	E. coli	(235 cfu/100 mL)
		1800	E. coli (	1600	E. coli	(235 cfu/100 mL)
		2000	E. coli (	60	E. coli	(235 cfu/100 mL)
		250	E. coli (	240	E. coli	(235 cfu/100 mL)
		120	E. coli (	250	E. coli	(235 cfu/100 mL)
		250	E. coli (	220	E. coli	(235 cfu/100 mL)
		910	E. coli (	260	E. coli	(235 cfu/100 mL)
		90	E. coli (	600	E. coli	(235 cfu/100 mL)
		50	E. coli (	190	E. coli	(235 cfu/100 mL)
		200	E. coli (	160	E. coli	(235 cfu/100 mL)
		330	E. coli (	32	E. coli	(235 cfu/100 mL)
		180	E. coli (	8	E. coli	(235 cfu/100 mL)
		3100	E. coli (	20	E. coli	(235 cfu/100 mL)
		740	E. coli (	8	E. coli	(235 cfu/100 mL)
		210	E. coli (	8	E. coli	(235 cfu/100 mL)
		140	E. coli (	2000	E. coli	(235 cfu/100 mL)
		510	E. coli (	249	E. coli	(235 cfu/100 mL)
		310	E. coli (	88	E. coli	(235 cfu/100 mL)
		1400	E. coli (	36	E. coli	(235 cfu/100 mL)
		200	E. coli (	20	E. coli	(235 cfu/100 mL)
		70	E. coli (	300	E. coli	(235 cfu/100 mL)
		380	E. coli (	260	E. coli	(235 cfu/100 mL)
		530	E. coli (	620	E. coli	(235 cfu/100 mL)
		80	E. coli (	250	E. coli	(235 cfu/100 mL)
		2000	E. coli (	500	E. coli	(235 cfu/100 mL)
		3400	E. coli (	200	E. coli	(235 cfu/100 mL)
		460	E. coli (	20	E. coli	(235 cfu/100 mL)
		330	E. coli (	800	E. coli	(235 cfu/100 mL)
		740	E. coli (	340	E. coli	(235 cfu/100 mL)
		890	E. coli (	29	E. coli	(235 cfu/100 mL)
		1400	E. coli (	67	E. coli	(235 cfu/100 mL)
		70	E. coli (	24	E. coli	(235 cfu/100 mL)
		130	E. coli (	34	E. coli	(235 cfu/100 mL)
		17000	E. coli (	3	E. coli	(235 cfu/100 mL)
		22000	E. coli (	5	E. coli	(235 cfu/100 mL)
		2700	E. coli (	64	E. coli	(235 cfu/100 mL)
		1400	E. coli (	18	E. coli	(235 cfu/100 mL)
		210	E. coli (	56	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
		2200	E. coli (	1	E. coli	(235 cfu/100 mL)
		8100	E. coli (	159	E. coli	(235 cfu/100 mL)
		290	E. coli (	41	E. coli	(235 cfu/100 mL)
		600	E. coli (	25	E. coli	(235 cfu/100 mL)
		120000	E. coli (	365	E. coli	(235 cfu/100 mL)
		15000	E. coli (	3972	E. coli	(235 cfu/100 mL)
		10	E. coli (	9676	E. coli	(235 cfu/100 mL)
		90	E. coli (	189	E. coli	(235 cfu/100 mL)
		800	E. coli (	1844	E. coli	(235 cfu/100 mL)
		690	E. coli (	8220	E. coli	(235 cfu/100 mL)
		1600	E. coli (	452	E. coli	(235 cfu/100 mL)
				7754	E. coli	(235 cfu/100 mL)
				798	E. coli	(235 cfu/100 mL)
				325	E. coli	(235 cfu/100 mL)
				264	E. coli	(235 cfu/100 mL)
				8212	E. coli	(235 cfu/100 mL)
				84	E. coli	(235 cfu/100 mL)
				816	E. coli	(235 cfu/100 mL)
				840	E. coli	(235 cfu/100 mL)
				1352	E. coli	(235 cfu/100 mL)
				576	E. coli	(235 cfu/100 mL)
				6510	E. coli	(235 cfu/100 mL)
				12262	E. coli	(235 cfu/100 mL)
				238	E. coli	(235 cfu/100 mL)
				160	E. coli	(235 cfu/100 mL)
				299	E. coli	(235 cfu/100 mL)
				169	E. coli	(235 cfu/100 mL)
				60	E. coli	(235 cfu/100 mL)
				126	E. coli	(235 cfu/100 mL)
				365	E. coli	(235 cfu/100 mL)
				345	E. coli	(235 cfu/100 mL)
				61	E. coli	(235 cfu/100 mL)
				35	E. coli	(235 cfu/100 mL)
				6890	E. coli	(235 cfu/100 mL)
				192	E. coli	(235 cfu/100 mL)
				73	E. coli	(235 cfu/100 mL)
				291	E. coli	(235 cfu/100 mL)
				291	E. coli	(235 cfu/100 mL)
				77	E. coli	(235 cfu/100 mL)
				1733	E. coli	(235 cfu/100 mL)
				46110	E. coli	(235 cfu/100 mL)
				613	E. coli	(235 cfu/100 mL)
				727	E. coli	(235 cfu/100 mL)
				326	E. coli	(235 cfu/100 mL)
				461	E. coli	(235 cfu/100 mL)
				1120	E. coli	(235 cfu/100 mL)
				118	E. coli	(235 cfu/100 mL)
				344	E. coli	(235 cfu/100 mL)
				37	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. Coli
				866	E. coli	(235 cfu/100 mL)
				365	E. coli	(235 cfu/100 mL)
				50	E. coli	(235 cfu/100 mL)
				59	E. coli	(235 cfu/100 mL)
				17	E. coli	(235 cfu/100 mL)
				194	E. coli	(235 cfu/100 mL)
				>2420	E. coli	(235 cfu/100 mL)
				345	E. coli	(235 cfu/100 mL)
				161	E. coli	(235 cfu/100 mL)
				111	E. coli	(235 cfu/100 mL)
				115	E. coli	(235 cfu/100 mL)
				93	E. coli	(235 cfu/100 mL)
				11530	E. coli	(235 cfu/100 mL)
				201	E. coli	(235 cfu/100 mL)
				16160	E. coli	(235 cfu/100 mL)
				100	E. coli	(235 cfu/100 mL)
				4080	E. coli	(235 cfu/100 mL)
				99	E. coli	(235 cfu/100 mL)
				6400	E. coli	(235 cfu/100 mL)
				166	E. coli	(235 cfu/100 mL)
				816	E. coli	(235 cfu/100 mL)
				866	E. coli	(235 cfu/100 mL)
				1553	E. coli	(235 cfu/100 mL)
				758	E. coli	(235 cfu/100 mL)
				365	E. coli	(235 cfu/100 mL)
				210	E. coli	(235 cfu/100 mL)
				88	E. coli	(235 cfu/100 mL)
				548	E. coli	(235 cfu/100 mL)
				488	E. coli	(235 cfu/100 mL)
				548	E. coli	(235 cfu/100 mL)
				649	E. coli	(235 cfu/100 mL)
				228	E. coli	(235 cfu/100 mL)
				613	E. coli	(235 cfu/100 mL)
				1986	E. coli	(235 cfu/100 mL)
				1414	E. coli	(235 cfu/100 mL)
				435	E. coli	(235 cfu/100 mL)
				81640	E. coli	(235 cfu/100 mL)
				816	E. coli	(235 cfu/100 mL)
				2420	E. coli	(235 cfu/100 mL)
				261	E. coli	(235 cfu/100 mL)
				82	E. coli	(235 cfu/100 mL)
				248	E. coli	(235 cfu/100 mL)

Summary Range			
	St. Marys @ Spy Run - 1980s Fecal	St. Marys @ Spy Run - 1990s E. Coli	St. Marys @ Spy Run - 2000s E. Coli
Minimum:	10	10	1
5th Percentile:	31	51	20
25th Percentile:	620	240	145
Median:	1,700	590	365
75th Percentile:	4,950	1,800	935
95th Percentile:	11,400	16,950	6,976
Maximum:	29,000	120,000	81,640

Chart Data			
	St. Marys @ Spy Run - 1980s Fecal Coliform	St. Marys @ Spy Run - 1990s E. Coli	St. Marys @ Spy Run - 2000s E. Coli
Series 1	10	10	1
Series 2	21	41	19
Series 3	589	190	125
Series 4	1,080	350	221
Series 5	3,250	1,210	570
Series 6	6,450	15,150	6,041
Series 7	17,600	103,050	74,664

APPENDIX I: Data Set for Maumee River @ Anthony Boulevard

Box and Whiskers Graph

Maumee @ Anthony Boulevard - 1970s Fecal Coliform		Maumee @ Anthony Boulevard - 1980s Fecal Coliform		Maumee @ Anthony Boulevard - 2000s E. Coli		
Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. coli
750	Coliform	190	Coliform	560	E. coli	(235 cfu/100 mL)
3600	Coliform	2100	Coliform	340	E. coli	(235 cfu/100 mL)
520	Coliform	100	Coliform	1320	E. coli	(235 cfu/100 mL)
1200	Coliform	5500	Coliform	1000	E. coli	(235 cfu/100 mL)
2200	Coliform	1800	Coliform	20	E. coli	(235 cfu/100 mL)
570	Coliform	120	Coliform	44	E. coli	(235 cfu/100 mL)
1300	Coliform	5000	Coliform	26	E. coli	(235 cfu/100 mL)
4800	Coliform	910	Coliform	432	E. coli	(235 cfu/100 mL)
2700	Coliform	780	Coliform	590	E. coli	(235 cfu/100 mL)
380	Coliform	760	Coliform	1000	E. coli	(235 cfu/100 mL)
710	Coliform	180	Coliform	570	E. coli	(235 cfu/100 mL)
2200	Coliform	150	Coliform	230	E. coli	(235 cfu/100 mL)
5600	Coliform	8100	Coliform	1600	E. coli	(235 cfu/100 mL)
670	Coliform	9900	Coliform	150	E. coli	(235 cfu/100 mL)
260	Coliform	190	Coliform	980	E. coli	(235 cfu/100 mL)
110	Coliform	20	Coliform	60	E. coli	(235 cfu/100 mL)
470	Coliform	30	Coliform	980	E. coli	(235 cfu/100 mL)
390	Coliform	3400	Coliform	810	E. coli	(235 cfu/100 mL)
50	Coliform	280	Coliform	330	E. coli	(235 cfu/100 mL)
1000	Coliform	5200	Coliform	110	E. coli	(235 cfu/100 mL)
440	Coliform	690	Coliform	6000	E. coli	(235 cfu/100 mL)
210	Coliform	5400	Coliform	1080	E. coli	(235 cfu/100 mL)
510	Coliform	540	Coliform	260	E. coli	(235 cfu/100 mL)
20	Coliform	140	Coliform	2400	E. coli	(235 cfu/100 mL)
240	Coliform	360	Coliform	8000	E. coli	(235 cfu/100 mL)
50	Coliform	460	Coliform	20000	E. coli	(235 cfu/100 mL)
600	Coliform	2600	Coliform	460	E. coli	(235 cfu/100 mL)
5900	Coliform	770	Coliform	440	E. coli	(235 cfu/100 mL)
790	Coliform	270	Coliform	3200	E. coli	(235 cfu/100 mL)
3200	Coliform	840	Coliform	700	E. coli	(235 cfu/100 mL)
810	Coliform	130	Coliform	220	E. coli	(235 cfu/100 mL)
270	Coliform	50	Coliform	616	E. coli	(235 cfu/100 mL)
140	Coliform	2200	Coliform	1040	E. coli	(235 cfu/100 mL)
3700	Coliform	2100	Coliform	460	E. coli	(235 cfu/100 mL)
46	Coliform	2600	Coliform	360	E. coli	(235 cfu/100 mL)
570	Coliform	440	Coliform	4440	E. coli	(235 cfu/100 mL)
330	Coliform	2900	Coliform	300	E. coli	(235 cfu/100 mL)
260	Coliform	42000	Coliform	4300	E. coli	(235 cfu/100 mL)
80	Coliform	1800	Coliform	100	E. coli	(235 cfu/100 mL)
750	Coliform	4000	Coliform	1100	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. coli
320	Coliform	9600	Coliform	540	E. coli	(235 cfu/100 mL)
120	Coliform	1100	Coliform	330	E. coli	(235 cfu/100 mL)
1600	Coliform	1000	Coliform	260	E. coli	(235 cfu/100 mL)
520	Coliform	620	Coliform	430	E. coli	(235 cfu/100 mL)
400	Coliform	40	Coliform	540	E. coli	(235 cfu/100 mL)
1800	Coliform	8800	Coliform	290	E. coli	(235 cfu/100 mL)
560	Coliform	2200	Coliform	70	E. coli	(235 cfu/100 mL)
150	Coliform	1200	Coliform	470	E. coli	(235 cfu/100 mL)
2500	Coliform	190	Coliform	60	E. coli	(235 cfu/100 mL)
1800	Coliform	38000	Coliform	270	E. coli	(235 cfu/100 mL)
1800	Coliform	520	Coliform	600	E. coli	(235 cfu/100 mL)
530	Coliform	6400	Coliform	400	E. coli	(235 cfu/100 mL)
830	Coliform	3200	Coliform	2400	E. coli	(235 cfu/100 mL)
680	Coliform	1600	Coliform	110	E. coli	(235 cfu/100 mL)
880	Coliform	2800	Coliform	50	E. coli	(235 cfu/100 mL)
		13000	Coliform	90	E. coli	(235 cfu/100 mL)
				900	E. coli	(235 cfu/100 mL)
				310	E. coli	(235 cfu/100 mL)
				220	E. coli	(235 cfu/100 mL)
				70	E. coli	(235 cfu/100 mL)
				115	E. coli	(235 cfu/100 mL)
				800	E. coli	(235 cfu/100 mL)
				80	E. coli	(235 cfu/100 mL)
				9	E. coli	(235 cfu/100 mL)
				13	E. coli	(235 cfu/100 mL)
				28	E. coli	(235 cfu/100 mL)
				1100	E. coli	(235 cfu/100 mL)
				146	E. coli	(235 cfu/100 mL)
				84	E. coli	(235 cfu/100 mL)
				40	E. coli	(235 cfu/100 mL)
				44	E. coli	(235 cfu/100 mL)
				495	E. coli	(235 cfu/100 mL)
				320	E. coli	(235 cfu/100 mL)
				400	E. coli	(235 cfu/100 mL)
				250	E. coli	(235 cfu/100 mL)
				300	E. coli	(235 cfu/100 mL)
				140	E. coli	(235 cfu/100 mL)
				10	E. coli	(235 cfu/100 mL)
				760	E. coli	(235 cfu/100 mL)
				230	E. coli	(235 cfu/100 mL)
				42	E. coli	(235 cfu/100 mL)
				26	E. coli	(235 cfu/100 mL)
				10	E. coli	(235 cfu/100 mL)
				14	E. coli	(235 cfu/100 mL)
				3	E. coli	(235 cfu/100 mL)
				5	E. coli	(235 cfu/100 mL)
				104	E. coli	(235 cfu/100 mL)
				80	E. coli	(235 cfu/100 mL)
				136	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. coli
				15	E. coli	(235 cfu/100 mL)
				82	E. coli	(235 cfu/100 mL)
				31	E. coli	(235 cfu/100 mL)
				17	E. coli	(235 cfu/100 mL)
				291	E. coli	(235 cfu/100 mL)
				3972	E. coli	(235 cfu/100 mL)
				4480	E. coli	(235 cfu/100 mL)
				166	E. coli	(235 cfu/100 mL)
				9680	E. coli	(235 cfu/100 mL)
				6260	E. coli	(235 cfu/100 mL)
				406	E. coli	(235 cfu/100 mL)
				5178	E. coli	(235 cfu/100 mL)
				436	E. coli	(235 cfu/100 mL)
				153	E. coli	(235 cfu/100 mL)
				126	E. coli	(235 cfu/100 mL)
				9222	E. coli	(235 cfu/100 mL)
				85	E. coli	(235 cfu/100 mL)
				728	E. coli	(235 cfu/100 mL)
				808	E. coli	(235 cfu/100 mL)
				710	E. coli	(235 cfu/100 mL)
				602	E. coli	(235 cfu/100 mL)
				8704	E. coli	(235 cfu/100 mL)
				9768	E. coli	(235 cfu/100 mL)
				218	E. coli	(235 cfu/100 mL)
				187	E. coli	(235 cfu/100 mL)
				84	E. coli	(235 cfu/100 mL)
				105	E. coli	(235 cfu/100 mL)
				57	E. coli	(235 cfu/100 mL)
				84	E. coli	(235 cfu/100 mL)
				411	E. coli	(235 cfu/100 mL)
				102	E. coli	(235 cfu/100 mL)
				41	E. coli	(235 cfu/100 mL)
				19	E. coli	(235 cfu/100 mL)
				1733	E. coli	(235 cfu/100 mL)
				145	E. coli	(235 cfu/100 mL)
				40	E. coli	(235 cfu/100 mL)
				179	E. coli	(235 cfu/100 mL)
				152	E. coli	(235 cfu/100 mL)
				50	E. coli	(235 cfu/100 mL)
				4220	E. coli	(235 cfu/100 mL)
				22820	E. coli	(235 cfu/100 mL)
				345	E. coli	(235 cfu/100 mL)
				96	E. coli	(235 cfu/100 mL)
				365	E. coli	(235 cfu/100 mL)
				76	E. coli	(235 cfu/100 mL)
				548	E. coli	(235 cfu/100 mL)
				105	E. coli	(235 cfu/100 mL)
				260	E. coli	(235 cfu/100 mL)
				45	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard for E. coli
				2203	E. coli	(235 cfu/100 mL)
				228	E. coli	(235 cfu/100 mL)
				31	E. coli	(235 cfu/100 mL)
				29	E. coli	(235 cfu/100 mL)
				18	E. coli	(235 cfu/100 mL)
				365	E. coli	(235 cfu/100 mL)
				2420	E. coli	(235 cfu/100 mL)
				517	E. coli	(235 cfu/100 mL)
				135	E. coli	(235 cfu/100 mL)
				161	E. coli	(235 cfu/100 mL)
				2420	E. coli	(235 cfu/100 mL)
				54	E. coli	(235 cfu/100 mL)
				8690	E. coli	(235 cfu/100 mL)
				107	E. coli	(235 cfu/100 mL)
				12740	E. coli	(235 cfu/100 mL)
				100	E. coli	(235 cfu/100 mL)
				1986	E. coli	(235 cfu/100 mL)
				55	E. coli	(235 cfu/100 mL)
				3495	E. coli	(235 cfu/100 mL)
				122	E. coli	(235 cfu/100 mL)
				649	E. coli	(235 cfu/100 mL)
				579	E. coli	(235 cfu/100 mL)
				613	E. coli	(235 cfu/100 mL)
				649	E. coli	(235 cfu/100 mL)
				248	E. coli	(235 cfu/100 mL)
				99	E. coli	(235 cfu/100 mL)
				70	E. coli	(235 cfu/100 mL)
				435	E. coli	(235 cfu/100 mL)
				172	E. coli	(235 cfu/100 mL)
				378	E. coli	(235 cfu/100 mL)
				172	E. coli	(235 cfu/100 mL)
				73	E. coli	(235 cfu/100 mL)
				866	E. coli	(235 cfu/100 mL)
				2420	E. coli	(235 cfu/100 mL)
				816	E. coli	(235 cfu/100 mL)
				345	E. coli	(235 cfu/100 mL)
				15650	E. coli	(235 cfu/100 mL)
				150	E. coli	(235 cfu/100 mL)
				2420	E. coli	(235 cfu/100 mL)
				210	E. coli	(235 cfu/100 mL)
				152	E. coli	(235 cfu/100 mL)
				249	E. coli	(235 cfu/100 mL)

Summary Range			
	Maumee @ Anthony Boulevard -	Maumee @ Anthony Boulevard -	Maumee @ Anthony Boulevard -
Minimum:	20	20	3
5th Percentile:	50	48	18
25th Percentile:	295	278	95
Median:	570	1,050	291
75th Percentile:	1,450	3,250	770
95th Percentile:	4,030	10,675	8,034
Maximum:	5,900	42,000	22,820

Chart Data			
	Maumee @ Anthony Boulevard - 1970s Fecal Coliform	Maumee @ Anthony Boulevard - 1980s Fecal Coliform	Maumee @ Anthony Boulevard - 2000s E. Coli
Series 1	20	20	3
Series 2	30	28	15
Series 3	245	230	77
Series 4	275	773	196
Series 5	880	2,200	480
Series 6	2,580	7,425	7,264
Series 7	1,870	31,325	14,786

APPENDIX J: Data Set for Maumee River @ Landin Road

Box and Whiskers Graph

Maumee @ Landin Road - 1990s E. Coli		Maumee @ Landin Road - 2000s E. Coli		
Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable standard for E. coli
2900	E. coli (	730	E. coli	(235 cfu/100 mL)
1600	E. coli (	240	E. coli	(235 cfu/100 mL)
340	E. coli (	770	E. coli	(235 mpn/100 mL)
30	E. coli (	600	E. coli	(235 cfu/100 mL)
330	E. coli (	270	E. coli	(235 cfu/100 mL)
90	E. coli (	390	E. coli	(235 cfu/100 mL)
150	E. coli (	480	E. coli	(235 cfu/100 mL)
6200	E. coli (	10	E. coli	(235 cfu/100 mL)
5200	E. coli (	44	E. coli	(235 cfu/100 mL)
2200	E. coli (	64	E. coli	(235 cfu/100 mL)
10	E. coli (	308	E. coli	(235 cfu/100 mL)
430	E. coli (	650	E. coli	(235 cfu/100 mL)
340	E. coli (	600	E. coli	(235 cfu/100 mL)
400	E. coli (	360	E. coli	(235 cfu/100 mL)
210	E. coli (	170	E. coli	(235 cfu/100 mL)
10	E. coli (	1024	E. coli	(235 cfu/100 mL)
550	E. coli (	200	E. coli	(235 cfu/100 mL)
6300	E. coli (	800	E. coli	(235 cfu/100 mL)
780	E. coli (	60	E. coli	(235 cfu/100 mL)
360	E. coli (	830	E. coli	(235 cfu/100 mL)
220	E. coli (	1020	E. coli	(235 cfu/100 mL)
730	E. coli (	440	E. coli	(235 cfu/100 mL)
40	E. coli (	60	E. coli	(235 cfu/100 mL)
450	E. coli (	3200	E. coli	(235 cfu/100 mL)
380	E. coli (	920	E. coli	(235 cfu/100 mL)
5400	E. coli (	200	E. coli	(235 cfu/100 mL)
1200	E. coli (	2240	E. coli	(235 cfu/100 mL)
3500	E. coli (	1460	E. coli	(235 cfu/100 mL)
18000	E. coli (	8000	E. coli	(235 cfu/100 mL)
190	E. coli (	500	E. coli	(235 cfu/100 mL)
10	E. coli (	1020	E. coli	(235 cfu/100 mL)
810	E. coli (	4600	E. coli	(235 cfu/100 mL)
130	E. coli (	620	E. coli	(235 cfu/100 mL)
70	E. coli (	1020	E. coli	(235 cfu/100 mL)
150	E. coli (	768	E. coli	(235 cfu/100 mL)
150	E. coli (	440	E. coli	(235 cfu/100 mL)
290	E. coli (	400	E. coli	(235 cfu/100 mL)
20	E. coli (	300	E. coli	(235 cfu/100 mL)
170	E. coli (	5000	E. coli	(235 cfu/100 mL)
2200	E. coli (	400	E. coli	(235 cfu/100 mL)
790	E. coli (	5400	E. coli	(235 cfu/100 mL)
50	E. coli (	300	E. coli	(235 cfu/100 mL)
110	E. coli (	1800	E. coli	(235 cfu/100 mL)
400	E. coli (	200	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable standard for E. coli
540	E. coli (	470	E. coli	(235 cfu/100 mL)
160	E. coli (	250	E. coli	(235 cfu/100 mL)
340	E. coli (	660	E. coli	(235 cfu/100 mL)
200	E. coli (	430	E. coli	(235 cfu/100 mL)
330	E. coli (	420	E. coli	(235 cfu/100 mL)
150	E. coli (	400	E. coli	(235 cfu/100 mL)
870	E. coli (	130	E. coli	(235 cfu/100 mL)
90	E. coli (	160	E. coli	(235 cfu/100 mL)
1700	E. coli (	65	E. coli	(235 cfu/100 mL)
2600	E. coli (	620	E. coli	(235 cfu/100 mL)
320	E. coli (	1480	E. coli	(235 cfu/100 mL)
120	E. coli (	420	E. coli	(235 cfu/100 mL)
630	E. coli (	560	E. coli	(235 cfu/100 mL)
50	E. coli (	370	E. coli	(235 cfu/100 mL)
2900	E. coli (	640	E. coli	(235 cfu/100 mL)
170	E. coli (	680	E. coli	(235 cfu/100 mL)
170	E. coli (	220	E. coli	(235 cfu/100 mL)
3300	E. coli (	130	E. coli	(235 cfu/100 mL)
59000	E. coli (	105	E. coli	(235 cfu/100 mL)
1800	E. coli (	270	E. coli	(235 cfu/100 mL)
40	E. coli (	32	E. coli	(235 cfu/100 mL)
30	E. coli (	36	E. coli	(235 cfu/100 mL)
2600	E. coli (	7	E. coli	(235 cfu/100 mL)
8800	E. coli (	48	E. coli	(235 cfu/100 mL)
540	E. coli (	28	E. coli	(235 cfu/100 mL)
150	E. coli (	1000	E. coli	(235 cfu/100 mL)
21000	E. coli (	152	E. coli	(235 cfu/100 mL)
310	E. coli (	64	E. coli	(235 cfu/100 mL)
30	E. coli (	352	E. coli	(235 cfu/100 mL)
1400	E. coli (	296	E. coli	(235 cfu/100 mL)
590	E. coli (	500	E. coli	(235 cfu/100 mL)
220	E. coli (	340	E. coli	(235 cfu/100 mL)
870	E. coli (	500	E. coli	(235 cfu/100 mL)
		200	E. coli	(235 cfu/100 mL)
		1500	E. coli	(235 cfu/100 mL)
		140	E. coli	(235 cfu/100 mL)
		15	E. coli	(235 cfu/100 mL)
		840	E. coli	(235 cfu/100 mL)
		250	E. coli	(235 cfu/100 mL)
		78	E. coli	(235 cfu/100 mL)
		22	E. coli	(235 cfu/100 mL)
		8	E. coli	(235 cfu/100 mL)
		20	E. coli	(235 cfu/100 mL)
		1	E. coli	(235 cfu/100 mL)
		7	E. coli	(235 cfu/100 mL)
		24	E. coli	(235 cfu/100 mL)
		78	E. coli	(235 cfu/100 mL)
		84	E. coli	(235 cfu/100 mL)
		52	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable standard for E. coli
		51	E. coli	(235 cfu/100 mL)
		27	E. coli	(235 cfu/100 mL)
		16	E. coli	(235 cfu/100 mL)
		411	E. coli	(235 cfu/100 mL)
		4840	E. coli	(235 cfu/100 mL)
		630	E. coli	(235 cfu/100 mL)
		110	E. coli	(235 cfu/100 mL)
		9680	E. coli	(235 cfu/100 mL)
		7740	E. coli	(235 cfu/100 mL)
		366	E. coli	(235 cfu/100 mL)
		5767	E. coli	(235 cfu/100 mL)
		500	E. coli	(235 cfu/100 mL)
		186	E. coli	(235 cfu/100 mL)
		786	E. coli	(235 cfu/100 mL)
		1024	E. coli	(235 cfu/100 mL)
		63	E. coli	(235 cfu/100 mL)
		456	E. coli	(235 cfu/100 mL)
		700	E. coli	(235 cfu/100 mL)
		424	E. coli	(235 cfu/100 mL)
		1092	E. coli	(235 cfu/100 mL)
		2924	E. coli	(235 cfu/100 mL)
		16328	E. coli	(235 cfu/100 mL)
		292	E. coli	(235 cfu/100 mL)
		97	E. coli	(235 cfu/100 mL)
		113	E. coli	(235 cfu/100 mL)
		152	E. coli	(235 cfu/100 mL)
		161	E. coli	(235 cfu/100 mL)
		162	E. coli	(235 cfu/100 mL)
		387	E. coli	(235 cfu/100 mL)
		84	E. coli	(235 cfu/100 mL)
		47	E. coli	(235 cfu/100 mL)
		13	E. coli	(235 cfu/100 mL)
		4430	E. coli	(235 cfu/100 mL)
		111	E. coli	(235 cfu/100 mL)
		23	E. coli	(235 cfu/100 mL)
		435	E. coli	(235 cfu/100 mL)
		238	E. coli	(235 cfu/100 mL)
		40	E. coli	(235 cfu/100 mL)
		345	E. coli	(235 cfu/100 mL)
		10760	E. coli	(235 cfu/100 mL)
		192	E. coli	(235 cfu/100 mL)
		61	E. coli	(235 cfu/100 mL)
		144	E. coli	(235 cfu/100 mL)
		84	E. coli	(235 cfu/100 mL)
		866	E. coli	(235 cfu/100 mL)
		261	E. coli	(235 cfu/100 mL)
		488	E. coli	(235 cfu/100 mL)
		178	E. coli	(235 cfu/100 mL)
		1986	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable standard for E. coli
		308	E. coli	(235 cfu/100 mL)
		147	E. coli	(235 cfu/100 mL)
		138	E. coli	(235 cfu/100 mL)
		126	E. coli	(235 cfu/100 mL)
		517	E. coli	(235 cfu/100 mL)
		2420	E. coli	(235 cfu/100 mL)
		387	E. coli	(235 cfu/100 mL)
		166	E. coli	(235 cfu/100 mL)
		82	E. coli	(235 cfu/100 mL)
		727	E. coli	(235 cfu/100 mL)
		91	E. coli	(235 cfu/100 mL)
		14140	E. coli	(235 cfu/100 mL)
		127	E. coli	(235 cfu/100 mL)
		4200	E. coli	(235 cfu/100 mL)
		100	E. coli	(235 cfu/100 mL)
		1300	E. coli	(235 cfu/100 mL)
		44	E. coli	(235 cfu/100 mL)
		3310	E. coli	(235 cfu/100 mL)
		127	E. coli	(235 cfu/100 mL)
		118	E. coli	(235 cfu/100 mL)
		687	E. coli	(235 cfu/100 mL)
		727	E. coli	(235 cfu/100 mL)
		272	E. coli	(235 cfu/100 mL)
		225	E. coli	(235 cfu/100 mL)
		119	E. coli	(235 cfu/100 mL)
		60	E. coli	(235 cfu/100 mL)
		308	E. coli	(235 cfu/100 mL)
		142	E. coli	(235 cfu/100 mL)
		435	E. coli	(235 cfu/100 mL)
		161	E. coli	(235 cfu/100 mL)
		130	E. coli	(235 cfu/100 mL)
		365	E. coli	(235 cfu/100 mL)
		2420	E. coli	(235 cfu/100 mL)
		548	E. coli	(235 cfu/100 mL)
		238	E. coli	(235 cfu/100 mL)
		2420	E. coli	(235 cfu/100 mL)
		261	E. coli	(235 cfu/100 mL)
		2420	E. coli	(235 cfu/100 mL)
		194	E. coli	(235 cfu/100 mL)
		313	E. coli	(235 cfu/100 mL)
		236	E. coli	(235 cfu/100 mL)

Summary Range		
	Maumee @ Landin Road - 1990s E. Coli	Maumee @ Landin Road - 2000s E. Coli
Minimum:	10	1
5th Percentile:	28	22
25th Percentile:	150	123
Median:	340	308
75th Percentile:	1,400	694
95th Percentile:	6,800	4,816
Maximum:	59,000	16,328

Chart Data		
	Maumee @ Landin Road - 1990s E. Coli	Maumee @ Landin Road - 2000s E. Coli
Series 1	10	1
Series 2	18	21
Series 3	122	100
Series 4	190	186
Series 5	1,060	386
Series 6	5,400	4,123
Series 7	52,200	11,512

APPENDIX K: Data Set for Maumee River @ SR 101

Box and Whiskers Graph

Maumee @ SR101 - 1970s Fecal Coliform		Maumee @ SR101 - 1980s Fecal Coliform		Maumee @ SR101 - 1990s E. Coli		
Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard (E. coli)
1100	Coliform	150	Coliform	11000	E. coli	(235 cfu/100 mL)
1200	Coliform	180	Coliform	110	E. coli	(235 cfu/100 mL)
420	Coliform	260	Coliform	40	E. coli	(235 cfu/100 mL)
1200	Coliform	3300	Coliform	1200	E. coli	(235 cfu/100 mL)
1300	Coliform	20	Coliform	27000	E. coli	(235 cfu/100 mL)
1200	Coliform	6000	Coliform	220	E. coli	(235 cfu/100 mL)
2300	Coliform	5500	Coliform	370	E. coli	(235 cfu/100 mL)
180	Coliform	150	Coliform	410	E. coli	(235 cfu/100 mL)
5500	Coliform	1200	Coliform	6000	E. coli	(235 cfu/100 mL)
90	Coliform	2000	Coliform	290	E. coli	(235 cfu/100 mL)
720	Coliform	160	Coliform	1400	E. coli	(235 cfu/100 mL)
1200	Coliform	340	Coliform	1500	E. coli	(235 cfu/100 mL)
1100	Coliform	190	Coliform	270	E. coli	(235 cfu/100 mL)
1600	Coliform	160	Coliform	200	E. coli	(235 cfu/100 mL)
50	Coliform	35000	Coliform	4300	E. coli	(235 cfu/100 mL)
240	Coliform	54000	Coliform	700	E. coli	(235 cfu/100 mL)
800	Coliform	640	Coliform	680	E. coli	(235 cfu/100 mL)
220	Coliform	72000	Coliform	230	E. coli	(235 cfu/100 mL)
240	Coliform	3700	Coliform	100	E. coli	(235 cfu/100 mL)
130	Coliform	460	Coliform	160	E. coli	(235 cfu/100 mL)
1200	Coliform	4300	Coliform	1400	E. coli	(235 cfu/100 mL)
70	Coliform	910	Coliform	210	E. coli	(235 cfu/100 mL)
780	Coliform	130	Coliform	80	E. coli	(235 cfu/100 mL)
30	Coliform	14000	Coliform	170	E. coli	(235 cfu/100 mL)
480	Coliform	19000	Coliform	170	E. coli	(235 cfu/100 mL)
30	Coliform	140	Coliform	1400	E. coli	(235 cfu/100 mL)
670	Coliform	920	Coliform	630	E. coli	(235 cfu/100 mL)
860	Coliform	3700	Coliform	280	E. coli	(235 cfu/100 mL)
720	Coliform	110	Coliform	460	E. coli	(235 cfu/100 mL)
430	Coliform	980	Coliform	2800	E. coli	(235 cfu/100 mL)
40	Coliform	730	Coliform	860	E. coli	(235 cfu/100 mL)
2800	Coliform	540	Coliform	10	E. coli	(235 cfu/100 mL)
450	Coliform	310	Coliform	50	E. coli	(235 cfu/100 mL)
10	Coliform	2300	Coliform	840	E. coli	(235 cfu/100 mL)
50	Coliform	240	Coliform	170	E. coli	(235 cfu/100 mL)
3300	Coliform	10	Coliform	250	E. coli	(235 cfu/100 mL)
740	Coliform	500	Coliform	530	E. coli	(235 cfu/100 mL)
80	Coliform	1800	Coliform	3100	E. coli	(235 cfu/100 mL)
10	Coliform	1000	Coliform	1600	E. coli	(235 cfu/100 mL)
4400	Coliform	150	Coliform	130	E. coli	(235 cfu/100 mL)
500	Coliform	230	Coliform	60	E. coli	(235 cfu/100 mL)
600	Coliform	370	Coliform	310	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard (E. coli)
200	Coliform	150	Coliform	2100	E. coli	(235 cfu/100 mL)
20	Coliform	240	Coliform	330	E. coli	(235 cfu/100 mL)
4400	Coliform	550	Coliform	1700	E. coli	(235 cfu/100 mL)
2300	Coliform	1800	Coliform	700	E. coli	(235 cfu/100 mL)
2300	Coliform	220	Coliform	450	E. coli	(235 cfu/100 mL)
140	Coliform	30	Coliform	550	E. coli	(235 cfu/100 mL)
270	Coliform	10	Coliform	120	E. coli	(235 cfu/100 mL)
770	Coliform	3700	Coliform	1300	E. coli	(235 cfu/100 mL)
		1100	Coliform	30	E. coli	(235 cfu/100 mL)
		80	Coliform	390	E. coli	(235 cfu/100 mL)
		100	Coliform	250	E. coli	(235 cfu/100 mL)
		130	Coliform	180	E. coli	(235 cfu/100 mL)
		100	Coliform	2500	E. coli	(235 cfu/100 mL)
		95000	Coliform	210	E. coli	(235 cfu/100 mL)
		390	Coliform	39000	E. coli	(235 cfu/100 mL)
		2600	Coliform	630	E. coli	(235 cfu/100 mL)
		1900	Coliform	50	E. coli	(235 cfu/100 mL)
		340	Coliform	780	E. coli	(235 cfu/100 mL)
		800	Coliform	10	E. coli	(235 cfu/100 mL)
		2400	Coliform	50	E. coli	(235 cfu/100 mL)
		380	Coliform	20	E. coli	(235 cfu/100 mL)
		3200	Coliform	150	E. coli	(235 cfu/100 mL)
		200	Coliform	20	E. coli	(235 cfu/100 mL)
		3900	Coliform	270	E. coli	(235 cfu/100 mL)
		430	Coliform	10	E. coli	(235 cfu/100 mL)
		12000	Coliform	80	E. coli	(235 cfu/100 mL)
		790	Coliform	13000	E. coli	(235 cfu/100 mL)
		5300	Coliform	970	E. coli	(235 cfu/100 mL)
		190	Coliform	40	E. coli	(235 cfu/100 mL)
		1000	Coliform	140	E. coli	(235 cfu/100 mL)
		520	Coliform	400	E. coli	(235 cfu/100 mL)
		10	Coliform	800	E. coli	(235 cfu/100 mL)
		10	Coliform	280	E. coli	(235 cfu/100 mL)
		2200	Coliform	110	E. coli	(235 cfu/100 mL)
		920	Coliform	130	E. coli	(235 cfu/100 mL)
		120	Coliform	270	E. coli	(235 cfu/100 mL)
		90	Coliform	100	E. coli	(235 cfu/100 mL)
		130	Coliform	1200	E. coli	(235 cfu/100 mL)
		70	Coliform	30	E. coli	(235 cfu/100 mL)
		2600	Coliform	3300	E. coli	(235 cfu/100 mL)
		3600	Coliform	800	E. coli	(235 cfu/100 mL)
		1600	Coliform	120	E. coli	(235 cfu/100 mL)
		70	Coliform	240	E. coli	(235 cfu/100 mL)
				590	E. coli	(235 cfu/100 mL)
				350	E. coli	(235 cfu/100 mL)
				380	E. coli	(235 cfu/100 mL)
				60	E. coli	(235 cfu/100 mL)
				40	E. coli	(235 cfu/100 mL)
				1200	E. coli	(235 cfu/100 mL)

Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Result (cfu/100 mL)	Indicator Organism	Applicable Standard (E. coli)
				4900	E. coli	(235 cfu/100 mL)
				3300	E. coli	(235 cfu/100 mL)
				420	E. coli	(235 cfu/100 mL)
				190	E. coli	(235 cfu/100 mL)
				1700	E. coli	(235 cfu/100 mL)
				11000	E. coli	(235 cfu/100 mL)
				560	E. coli	(235 cfu/100 mL)
				110	E. coli	(235 cfu/100 mL)
				89000	E. coli	(235 cfu/100 mL)
				530	E. coli	(235 cfu/100 mL)
				40	E. coli	(235 cfu/100 mL)
				530	E. coli	(235 cfu/100 mL)
				440	E. coli	(235 cfu/100 mL)
				160	E. coli	(235 cfu/100 mL)
				710	E. coli	(235 cfu/100 mL)
				150	E. coli	(235 cfu/100 mL)
				310	E. coli	(235 mpn/100 mL)

Summary Range			
	Maumee @ SR101 - 1970s Fecal Coliform	Maumee @ SR101 - 1980s Fecal Coliform	Maumee @ SR101 - 1990s E. Coli
Minimum:	10	10	10
5th Percentile:	25	22	30
25th Percentile:	150	150	138
Median:	635	520	340
75th Percentile:	1,200	2,300	888
95th Percentile:	3,905	18,000	9,250
Maximum:	5,500	95,000	89,000

Chart Data			
	Maumee @ SR101 - 1970s Fecal Coliform	Maumee @ SR101 - 1980s Fecal Coliform	Maumee @ SR101 - 1990s E. Coli
Series 1	10	10	10
Series 2	15	12	20
Series 3	126	128	108
Series 4	485	370	203
Series 5	565	1,780	548
Series 6	2,705	15,700	8,362
Series 7	1,595	77,000	79,750

	Maumee @ SR101 - 1970s Fecal Coliform	Maumee @ SR101 - 1980s Fecal Coliform	Maumee @ SR101 - 1990s E. Coli

APPENDIX L: Substantial and Widespread Economic and Social Impact – Supporting Information

The City of Fort Wayne's original 2005 Financial Capability Analysis (Original FCA) is contained in Section 3.5 of the Long Term Control Plan (LTCP). The Municipal Preliminary Screener (MPS) analysis presented in this Updated UAA is based on updated information through the year 2018. Supporting information to the Updated UAA MPS analysis and comparisons to the Original UAA are summarized below.

Section 1 – Annual Operation and Maintenance (O&M) Cost Information

Original FCA analysis

- Annual O&M costs for the existing system were projected to increase at an average annual rate of 2.5 percent from the year 2005 baseline, plus additional costs for increases in the operation and maintenance of new facilities constructed as part of the LTCP and wastewater capital plans. The indexed annual costs were synchronized with the capital program implementation schedule and were compared to historical expenses and published rates for accuracy and consistency.
    - The 2005 annual O&M expense in the original FCA for sewer was $16,305,000. In addition to that O&M expense, there was an additional expense of $1,793,000 for Payment in Lieu of Taxes (PILOT).
    - The estimated annual O&M expense for the year 2017 projected in the original FCA was $27,116,000 with an additional estimated PILOT payment of $5,401,000.

Updated UAA MPS analysis

- Actual 2017 O&M expenses for sewer were used in the updated analysis and in some MPS analysis scenarios 2017 actual stormwater O&M expenses were also used. 2017 Sewer O&M is **$26,404,190** and 2017 Stormwater O&M is **$5,323,261.** Although the City believes PILOT is a legitimate part of its O&M expense for the Utility, PILOT was not included in the updated calculations, but is noted below. The following are a breakdown of O&M costs:

Wastewater Utility (excluding depreciation)		
Operating Expenses:		
Personnel services	$	9,028,357
Contractual services	$	4,288,511
Utilities	$	1,856,846
Chemicals	$	721,152
Administrative services	$	6,773,185
Other supplies and services	$	3,736,139
TOTAL O&M EXPENSE (EXCLUDING PILOT)	**$**	**26,404,190**
PILOT	$	4,670,166
TOTAL O&M EXPENSE (WITH PILOT)	$	31,074,356

Stormwater Utility (excluding depreciation)				
	Operating Expenses:			
		Personnel services		$ 1,980,449
		Contractual services		$ 244,868
		Administrative services		$ 2,546,941
		Other supplies and services		$ 551,003
	TOTAL O&M EXPENSE (EXCLUDING PILOT)			**$ 5,323,261**
		PILOT		$1,233,469
	TOTAL O&M EXPENSE (WITH PILOT)			$ 6,556,730

- The City continues to assume an average annual increase of 2.5% in total annual O&M costs is a reasonable projection.

Section 2 - Debt Service Information and Payment Requirements

Original FCA analysis

- Consistent with revenue bond requirements, the City assumed it would set rates to comply with a debt service coverage of 130 percent.
- City assumed 2% debt acquisition costs, 6% for average interest rates and a bond duration of 20 years
- Stormwater cost were not included

Updated UAA MPS analysis

- Consistent with revenue bond requirements, the City continues to assume it will maintain rates to comply with a debt service coverage of 130 percent.
- City continues to assume 2% debt acquisition costs, 6% for average interest rates and a bond duration of 20 years
- Stormwater costs were included in some MPS analysis scenarios
- The average annual debt service payment for existing debt (through 2018) is based on the average of 2019-2025 payments per the bond amortization schedules. This resulted in total annual average payment for sewer of **$43,839,865** and for stormwater **$2,145,057**

Bond Issues and Debt Service Requirements

	Principal Outstanding		Annual Debt Service Payment							
Sewer										
Year	Principal		2019	2020	2021	2022	2023	2024	2025	
2009A	3,443,758	SRF	248,944	248,945	248,945	248,945	248,946	248,944	248,945	
2009B	22,692,236	SRF	2,171,004	2,171,004	2,171,004	2,171,004	2,171,004	2,171,004	2,171,004	
2011A	30,280,000	Revenue	3,486,640	3,483,520	3,483,300	3,495,840	3,510,720	3,527,800	3,556,940	
2011B	26,667,000	SRF	2,120,715	2,120,533	2,120,526	2,120,673	2,120,949	2,120,332	2,120,822	
2012A	8,603,000	SRF	622,277	622,626	622,815	622,844	622,712	622,421	622,969	
2012B	12,515,000	Revenue	1,308,750	1,312,750	1,316,250	1,319,250	1,326,750	1,333,650	1,333,100	
2012	12,375,000	Revenue	2,166,293	2,166,640	2,166,553	2,171,030				
2013	2,765,000	Revenue								
2013A	27,140,000	Revenue	4,067,428	4,071,838	4,079,785	4,071,173	4,111,293	4,139,170		
2013B	42,260,000	Revenue	1,492,125	1,492,125	1,492,125	1,492,125	1,492,125	1,492,125	5,657,125	
2014A	15,543,000	SRF	1,119,400	1,119,835	1,119,823	1,119,365	1,119,461	1,120,086	1,119,218	
2014B	60,247,000	SRF	2,535,033	2,552,746	2,539,230	2,545,407	4,665,661	4,629,978	4,577,604	
2014C	4,820,000	SRF	350,563	348,954	352,192	350,121	352,897	350,366	352,681	
2016	35,125,000	Revenue	4,265,750	4,268,650	4,270,900	4,265,000	4,261,100	4,261,700	4,261,300	
2016A	108,000,000	SRF	6,223,700	6,225,800	6,221,200	6,225,000	6,222,000	6,222,300	6,225,800	
2016B	138,583,000	SRF	5,870,195	6,271,089	7,493,108	7,489,325	7,491,099	7,488,025	7,489,927	
2017A	16,700,000	Revenue	1,577,144	1,567,416	1,562,183	1,556,317	1,554,818	1,552,561	1,544,544	
2017B	16,700,000	Revenue	1,582,017	1,572,163	1,561,803	1,560,937	1,554,312	1,547,055	1,544,165	
2018A	742,584	SRF	757,687							
2018B	21,722,416	SRF	599,202	1,428,759	1,428,836	1,428,646	1,428,579	1,428,311	1,428,828	avg
			42,564,864	43,045,392	44,250,577	44,253,001	44,254,426	44,255,828	44,254,971	43,839,865
Stormwater										avg
SW 2017	27,320,000	Revenue	2,195,000	2,193,550	2,186,550	2,104,400	2,107,800	2,110,550	2,117,550	2,145,057

Section 3 - Capital Improvement Program Information

Original FCA analysis

- The City's capital improvement program (CIP) assumed that the City would move forward during the 2008-2025 year forecast period with the following plans and projects: the LTCP and sanitary sewer discharge elimination plans, sewer repair and replacement program, collection system and treatment master plans, as well as other projected wastewater improvements and maintenance needs within the collection system and at the City's treatment plant. The estimated cost of the total sewer CIP including the LTCP was approximately:

Original LTCP 2008-2025 Capital Program	**2005 Dollar Value**	**Inflated Dollar Value**
LTCP	$239.4 million	$361.7 million
Wastewater Improvements CIP	$454.6 million	$566.0 million
TOTAL	**$694.0 million**	**$927.7 million**

- Capital costs were projected to increase at an average annual rate of 3.5 percent. Thus, the estimated Inflated Dollar Value of the Capital Program, as noted in the table above, was calculated based upon each project's cost being inflated at 3.5 percent per year from 2005 up to the year it was scheduled to be completed.
- The City's repair, replacement, and capital maintenance activities were assumed to increase over time, reflecting the increased attention the systems will require as they age.
- Increases in future operating and maintenance costs for new infrastructure were incorporated based on projects that would directly result in new system components or improved performance.
- Stormwater capital improvement costs were not included

Updated UAA MPS analysis

- Actual CIP costs were used through 2018, with remaining sewer capital costs projected to increase at an average annual rate of 3.5 percent for 2019-2025. The results of actual costs and the remaining projected costs through 2025 are shown in the tables below.

Current LTCP 2008-2025 Capital Program	**2005 Dollar Value**	**Actual to Date & Projected Dollar Value**
LTCP	$339.9 million	$494.6 million
Wastewater Improvements CIP	$326.6 million	$471.7 million
TOTAL	**$666.5 million**	**$966.6 million**

- The City's sewer repair, replacement, and capital maintenance activities are assumed to continue to increase over time, reflecting the increased attention the systems will require as they age.
- The City's sewer capital improvement program assumes that the City will continue to move forward during the remaining period with projects from the LTCP and sanitary sewer overflow elimination plans, sewer repair and replacement program, collection system and treatment

master plans, as well as other projected wastewater improvements and maintenance needs within the collection system and at the City's treatment plant The current estimated cost of this capital improvement program is approximately:

- To implement complete capture and full control of all CSOs, the infrastructure would need to be significantly upsized, and the CIP estimated cost would be increased to approximately:

Full Control 2008-2025 Capital Program	**2005 Dollar Value**	**Actual to Date & Projected Dollar Value**
Full Control	$703.3 million	$1,080.0 million
Wastewater Improvements CIP	$326.6 million	$471.7 million
TOTAL	**$1029.9 million**	**$1551.7 million**

- A comparison and breakdown of the above noted 2008-2025 Current LTCP and Full Control cost estimates are provided in the following Exhibits, as well as more details on actual costs expended to date.
  - **Exhibit L-1**: Summary of all years 2008-2025 capital costs (in both 2005 dollar and inflated dollar value) as well as LTCP capital costs expended 2008-2018
- Stormwater capital improvement costs were included in some MPS analysis scenarios
- The City's stormwater capital improvement program assumes that the City will continue to move forward during the remaining period with projects for water quality improvements, capacity and repair and replacement programs, as well as other projected stormwater improvements and maintenance needs within the stormwater system.
- The following attachments provide additional or more detailed information on the Capital Programs used in the Updated analysis
  - **Exhibit L-2**: Summary of remaining years 2019-2025 Sewer Utility capital and O&M costs for CURRENT LTCP scenario
    - Average Annual Revenue funded CIP - **$16,483,614**
    - Expected increase in O&M from CIP - **$5,374,641**
    - Remaining LTCP Cost - **$241,724,068**
    - Remaining other Sewer CIP Costs - **$239,470,850**
    - Total CIP funded by Revenue - **$115,385,295**
    - Total CIP funded by Existing Bonds and Reimbursements - **$154,794,141**
  - **Exhibit L-3:** Summary of remaining years 2019-2025 Sewer Utility capital and O&M costs for FULL CONTROL scenario
    - Average Annual Revenue funded CIP - **$27,346,166**
    - Expected increase in O&M from CIP - **$13,709,020**
    - Remaining LTCP Cost - **$827,167,360**
    - Remaining other Sewer CIP Costs - **$239,470,850**
    - Total CIP funded by Revenue - **$191,423,165**
    - Total CIP funded by Existing Bonds and Reimbursements - **$154,794,141**
  - **Exhibit L-4:** Summary of remaining years 2019-2025 Stormwater Utility capital and O&M costs

- Average Annual Revenue funded CIP - **$7,240,610**
- Expected increase in O&M from CIP - **$384,577**
- Remaining Stormwater Cost - **$61,160,863**
- Total CIP funded by Revenue - **$50,681,610**
- Total CIP funded by Existing Bonds and Reimbursements - **$16,479,253**

Section 4 - Residential Flow Share

Original FCA analysis

- The Residential share of total wastewater flow in 2005 was estimated to be 60% based on a projection that the residential share of sewer flow increasing over time, as well as hydraulic modeling, land use information, infrastructure records and infiltration and inflow information at that time.

Updated UAA MPS analysis

- The Residential share of total wastewater flow currently is estimated to be **66.4%.**
  - The primary difference between the original projection and the current calculation appears to be due improved hydraulic modeling information for the combined area flows and updated GIS information on the allocation of inflow and infiltration.

Residential Flow Analysis - WPCP Annual Treatment Breakdown

2017

Flow Characterization	Total (MG)	Residential Share (MG)	Comment on Calculation / Source of Information
Billed Flow / Customer Consumption	**8,057.3**	3,664.2	per customer metering / billing records - 45.5% residential
Non-Billed Flow Breakdown			
Recycled discharge from Biosolids Facility*	1,100.0	500.2	per customer metering/billing records - 45.5% residential
Combined Sewer Area Stormwater	1,341.3	831.6	per modeling and GIS analysis of land use and runoff area of combined area - 62% residential
Public Pipe & Manhole Leakage Allowance	1,751.9	1576.3	per GIS pipe and manhole records for public pipe, design standards for leakage, portioned by customer count/billing records - 90% residential
Private Pipe & Manhole Leakage Allowance	628.4	487.1	per GIS pipe and manhole records for private pipe, design standards for leakage, portioned by GIS records - 77.5% residential
Collection System Inflow & Infiltration	6,348.4	5,712.2	general allocation of remaining I&I - distributed per customer count/billing records - 90% residential
Total Flow to Wastewater Treatment Plant**	**19,227.3**	**12,771.7**	
		66.4%	

* Biosolids Facility receives lime sludge water from water Filtration Plant and anerobic sludge water from WPCP, which is placed in ponds and decant water returned to WPCP

** Matches 2017 WPCP Influent Meter Records

Section 5 - Residential Customer Count

Original FCA analysis

- The City's residential customer count based on billing information was 71,496 in 2005

2005 CUSTOMER COUNT			
	Retail		**TOTAL**
		Residential	71,946
		Commercial	4,991
		Institutional	532
		Governmentl	160
		Industrial	319
		Sub-total Retail	77,948
	Wholesale		
		Contract	13
		Sub-total Wholesale	13
		TOTAL	**77,961**

Updated UAA MPS analysis

- The City's residential customer count based on current billing information is **81,796**

2017 CUSTOMER COUNT			
	Retail		**TOTAL**
		Residential	81,796
		Multi-Family	1,631
		Lg Multi-Family	793
		Sm Commercial	4,339
		Lg Commercial	1,196
		Institutional	637
		Governmentl	106
		Civil City	124
		Inter-Dept	9
		Industrial	276
		Sub-total Retail	90,906
	Wholesale		
		Contract	20
		Sub-total Wholesale	20
		TOTAL	**90,926**

Section 6 - Median Household Income

Original FCA analysis

- 1999 Median Household Income (MHI) was calculated by identifying each census tract in the service area and weighting it by population according to the formula prescribed by the guidance document. MHI was then inflated to 2005 by using the countywide rate of change from 1999 MHI, as reported in the 2000 census, to 2005 MHI, as reported in the 2005 American Community Survey (ACS). For future projections, MHI was forecasted to grow by 2.2% per year.
    - The 2005 MHI in the original FCA was $42,791
    - Forecasted to 2017, the MHI per the original FCA would been calculated to be $55,560

Updated UAA MPS analysis

- An MHI value of **$48,039** is used for the sewer service area. This figure is derived from the 2017 American Community Survey (ACS) 5-Year Estimates, which generates such financial data in years other than census years.
- An MHI value of **$35,881** is used to calculate the MPS for Wayne Township. This figure comes from the 2017 American Community Survey (ACS) 1-Year Estimates.
    - **Exhibit L-5:** Provides details on the calculation of MHI for the Sewer Service Area and Wayne Township

Section 7 - Residential Indicator / Municipal Preliminary Screener Values

Original FCA analysis

- The Residential Indicator calculation in the 2005 FCA for the original approved LTCP, was calculated for the peak year to be:
    - All of Sewer Service Area - 1.80%
    - Only Wayne Township - 2.49%

Updated UAA MPS analysis

- The details of the MPS calculations in the Updated UAA Table 5.5-5, using the updated information noted in Section 5.5 and the information in this Appendix L, can be found in the following Exhibits:
    - **Exhibit L-6:** Calculation of MPS for Full Control/WQS Compliance costs (sewer only costs) for:
        - All of Sewer Service Area - **2.96%**
        - Only Wayne Township - **3.97%**
    - **Exhibit L-7:** Calculation of MPS for Full Control/WQS Compliance costs (sewer and stormwater costs) for:
        - All of Sewer Service Area - **3.22%**
        - Only Wayne Township - **4.31%**
    - **Exhibit L-8:** Calculation of MPS for Current LTCP Compliance costs (sewer only costs) for:
        - All of Sewer Service Area - **1.87%**
        - Only Wayne Township - **2.51%**

- **Exhibit L-9:** Calculation of MPS for Current LTCP costs (sewer and stormwater costs) for:
  - All of Sewer Service Area - **2.13%**
  - Only Wayne Township - **2.85%**

Exhibit L-1: Comparison of Current LTCP and Full Control CIP's 2008-2025

Exhibit L-1
Comparison of Current LTCP and Full Control CIP's 2008-2025

FORT WAYNE LTCP - CSO CONTROL MEASURE COST SUMMARY COMPARISON

As of Jan 1, 2019

			CURRENT APPROVED LTCP	FULL CONTROL		CURRENT APPROVED LTCP	FULL CONTROL
			CURRENT / INFLATED $ VALUE			2005 $ VALUE	
CSOCM No.	Projects / Category of Work	Capital Cost Completed 2008-2018	Total Capital Cost 2008-2025	Total Capital Cost 2008-2025	Capital Cost Completed 2008-2018	Total Capital Cost 2008-2025	Total Capital Cost 2008-2025
1	Plant Phase II - Primaries	$-	$-	$-	$-	$-	$-
2	Plant Phase III - Increase Peak Flow	$22,317,154	$22,317,154	$22,317,154	$17,425,431	$17,425,431	$17,425,431
3	Early Floatable Control	$1,986,029	$1,986,029	$1,986,029	$1,777,987	$1,777,987	$1,777,987
4	CSSCIP - Phase I	$9,516,501	$9,516,501	$9,516,501	$8,041,892	$8,041,892	$8,041,892
5	WW Ponds Storage & Dewatering	$41,655,946	$41,655,946	$41,655,946	$34,025,743	$34,025,743	$34,025,743
6	CSSCIP - Phase II	$31,181,322	$33,691,322	$33,691,322	$24,100,919	$25,760,313	$25,760,313
7 & 8	St. Joe River Relief Sewers	$6,738,182	$6,738,182	$21,164,698	$5,132,693	$5,132,693	$14,392,331
9	CSO 61 & 62 Relief Sewer, CSO 54 Storage	$7,583,500	$9,193,500	$21,567,722	$5,337,913	$6,374,564	$14,316,940
10	Morton Street to WW Ponds	$10,401,510	$15,146,510	$24,959,262	$7,126,821	$10,263,804	$16,562,104
11	3RPORT Tunnel, Sewers, Pump Station	$121,376,924	$333,810,992	$839,248,006	$84,316,220	$219,349,083	$534,521,093
12	Foster Park Relief Sewer	$89,621	$18,574,621	$25,313,276	$69,068	$10,624,879	$14,487,795
13	Late Floatable Control	$-	$740,000	$740,000	$-	$409,723	$409,723
14	CSO 64 Satellite Storage	$-	$1,200,000	$7,516,901	$-	$684,346	$4,286,798
15	WW Ponds High Rate Treatment	$-	$-	$30,337,232	$-	$-	$17,298,000
	Total - LTCP	$252,846,689	$494,570,758	$1,080,014,049	$187,354,686	$339,870,457	$703,306,150
	Capital Costs Remaining (Years 2019-2025)		$241,724,068	$827,167,360		$152,515,770	$515,951,463

See Exhibit L-2 for breakdown

See Exhibit L-3 for breakdown

Exhibit L-2: Current LTCP and All Sewer CIP Costs 2019-2025

Exhibit L-2
Current LTCP and All Sewer CIP Costs 2019-2025

2019 - 2025 Capital Budget: SEWER UTILITY - CURRENT LTCP

DESCRIPTION	FUNDING SOURCE	2019 BUDGET	2020 BUDGET	2021 BUDGET	2022 BUDGET	2023 BUDGET	2024 BUDGET	2025 BUDGET	TOTAL	O&M Increases from New TOTAL
LTCP		84,364,068	52,770,000	30,780,000	40,010,000	18,540,000	8,610,000	6,650,000	241,724,068	3,254,294
WPC PLANT TOTALS		6,608,526	13,235,000	7,595,000	6,235,000	6,445,000	5,580,000	16,045,000	61,743,526	937,706
BIOSOLIDS TOTALS		618,679	870,000	160,000	160,000	1,875,000	1,785,000	370,000	5,838,679	12,070
WET WEATHER PUMPING & STORAGE TOTALS		2,697,473	995,000	465,000	325,000	1,140,000	3,400,000	1,630,000	10,652,473	130,079
COLLECTION SYSTEM PUMPING & STORAGE TOTALS		1,538,139	2,140,000	1,250,000	1,120,000	1,280,000	1,120,000	1,160,000	9,608,139	92,656
COLLECTION SYSTEMS TOTALS		9,823,236	28,500,000	20,505,000	14,805,000	14,995,000	22,825,000	33,865,000	145,318,236	870,719
WPC MAINTENANCE TOTALS		1,534,797	1,415,000	690,000	640,000	650,000	680,000	700,000	6,309,797	77,116
TOTAL SEWER UTILITY		107,184,918	99,925,000	61,445,000	63,295,000	44,925,000	44,000,000	60,420,000	481,194,918	5,374,641
	Revenue Funded	5,395,295	16,905,000	17,360,000	17,860,000	18,355,000	19,960,000	19,550,000	115,385,295	
								Avg per Year	16,483,614	
	Existing Bonds, Reimbursements, Etc. Funds	100,704,141	42,590,000	11,000,000	-	500,000	-	-	154,794,141	
	Future Bond 1	1,085,481	40,430,000						41,515,481	
	Future Bond 2			33,085,000	45,435,000	26,070,000			104,590,000	
	Future Bond 3						24,040,000	40,870,000	64,910,000	
									211,015,481	
Total LTCP Projects		84,364,068	52,770,000	30,780,000	40,010,000	18,540,000	8,610,000	6,650,000	241,724,068	3,254,294
Non LTCP Projects		22,820,850	47,155,000	30,665,000	23,285,000	26,385,000	35,390,000	53,770,000	239,470,850	2,120,346
Total Projects		107,184,918	99,925,000	61,445,000	63,295,000	44,925,000	44,000,000	60,420,000	481,194,918	5,374,641

Remaining LTCP Capital Costs

Remaining Other Wastewater Capital Costs

Estimated increase in O&M

Exhibit L-3: Full Control and All Sewer CIP Costs 2019-2025

Attachment L-3
Full Control and All Sewer
CIP Costs 2019-2025

2019 - 2025 Capital Budget: SEWER UTILITY - FULL CONTROL

DESCRIPTION	FUNDING SOURCE	2019 BUDGET	2020 BUDGET	2021 BUDGET	2022 BUDGET	2023 BUDGET	2024 BUDGET	2025 BUDGET	TOTAL	O&M Increases from New TOTAL
LTCP-FULL CONTROL		84,364,068	290,443,459	167,428,893	179,036,488	55,523,455	35,683,127	14,687,870	827,167,360	11,588,674
WPC PLANT TOTALS		6,608,526	13,235,000	7,595,000	6,235,000	6,445,000	5,580,000	16,045,000	61,743,526	937,706
BIOSOLIDS TOTALS		618,679	870,000	160,000	160,000	1,875,000	1,785,000	370,000	5,838,679	12,070
WET WEATHER PUMPING & STORAGE TOTALS		2,697,473	995,000	465,000	325,000	1,140,000	3,400,000	1,630,000	10,652,473	130,079
COLLECTION SYSTEM PUMPING & STORAGE TOTALS		1,538,139	2,140,000	1,250,000	1,120,000	1,280,000	1,120,000	1,160,000	9,608,139	92,656
COLLECTION SYSTEMS TOTALS		9,823,236	28,500,000	20,505,000	14,805,000	14,995,000	22,825,000	33,865,000	145,318,236	870,719
WPC MAINTENANCE TOTALS		1,534,797	1,415,000	690,000	640,000	650,000	680,000	700,000	6,309,797	77,116
TOTAL SEWER UTILITY		107,184,918	337,598,459	198,093,893	202,321,488	81,908,455	71,073,127	68,457,870	1,066,638,209	13,709,020
	Revenue Funded	5,395,295	24,905,000	32,360,000	32,860,000	33,355,000	34,960,000	27,587,870	191,423,165	
								Avg per Year	27,346,166	
	Existing Bonds, Reimbursements, Etc. Funds	100,704,141	42,590,000	11,000,000	-	500,000	-	-	154,794,141	
	Future Bond 1	1,085,481	270,103,459						271,188,940	
	Future Bond 2			154,733,893	169,461,488	48,053,455			372,248,835	
	Future Bond 3						36,113,127	40,870,000	76,983,127	
									720,420,902	
Total LTCP Projects		84,364,068	290,443,459	167,428,893	179,036,488	55,523,455	35,683,127	14,687,870	827,167,360	11,588,674
Non LTCP Projects		22,820,850	47,155,000	30,665,000	23,285,000	26,385,000	35,390,000	53,770,000	239,470,850	2,120,346
Total Projects		107,184,918	337,598,459	198,093,893	202,321,488	81,908,455	71,073,127	68,457,870	1,066,638,209	13,709,020

Remaining LTCP Capital Costs

Remaining Other Wastewater Capital Costs

Estimated increase in O&M

Exhibit L-4: Stormwater CIP Costs 2019-2025

Exhibit L-4 Stormwater CIP Costs 2019-2025

2019 - 2025 Capital Budget: STORMWATER

DESCRIPTION	FUNDING SOURCE	2019 BUDGET	2020 BUDGET	2021 BUDGET	2022 BUDGET	2023 BUDGET	2024 BUDGET	2025 BUDGET	TOTAL	O&M Increases from New TOTAL
STREAMS, DITCHES, DRAINS TOTALS		2,675,965	1,210,000	720,000	430,000	820,000	1,200,000	1,230,000	8,285,965	29,500
STORMWATER PUMPING & STORAGE TOTALS		277,133	90,000	60,000	60,000	120,000	120,000	130,000	857,133	15,020
FLOOD MANAGEMENT TOTALS		906,365	830,000	-	630,000	820,000	300,000	310,000	3,796,365	43,864
DRAINAGE SYSTEMS TOTALS		11,100,523	9,920,000	6,980,000	5,160,000	4,940,000	5,090,000	5,270,000	48,460,523	226,193
STORM MAINTENANCE TOTALS		1,030,877	720,000	590,000	810,000	840,000	870,000	900,000	5,760,877	70,000
TOTAL STORMWATER UTILITY		15,990,863	12,770,000	8,350,000	7,090,000	7,540,000	7,580,000	7,840,000	67,160,863	384,577
TOTAL SEWER UTILITY		0	0	0	0	0	0	0	-	
	Revenue Funded	5,311,610	7,880,000	7,440,000	7,090,000	7,540,000	7,580,000	7,840,000	50,681,610	
								Avg per Year	7,240,230	
	Existing Bonds, Reimbursements, Etc. Funds	10,679,253	4,890,000	910,000	-	-	-	-	16,479,253	
	Future Bond 1	-	-	-	-	-	-	-	-	

Remaining Other Stormwater Capital Costs

Estimated increase in O&M

Exhibit L-5: Sewer Service Area and Wayne Township Median Household Income

MEDIAN INCOME IN THE PAST 12 MONTHS (IN 2017 INFLATION-ADJUSTED DOLLARS)
2013-2017 American Community Survey 5-Year Estimates

Exhibit L-5 pg 1 of 2

Sewer Service Area Median Household Income

Geography	MHI	MHI Margin of Error	Households	HH Margin of Error	Weighted MHI
Census Tract 1, Allen County, Indiana	$45,000	8418	1128	43	$490.52
Census Tract 3, Allen County, Indiana	$52,109	15304	1327	81	$668.21
Census Tract 4, Allen County, Indiana	$43,946	4151	1213	92	$515.12
Census Tract 5, Allen County, Indiana	$27,418	8638	1284	103	$340.20
Census Tract 6, Allen County, Indiana	$32,500	4388	702	75	$220.47
Census Tract 7.01, Allen County, Indiana	$35,227	3473	1274	98	$433.69
Census Tract 7.04, Allen County, Indiana	$34,665	3290	1270	85	$425.43
Census Tract 8, Allen County, Indiana	$41,763	2516	1795	104	$724.41
Census Tract 9, Allen County, Indiana	$33,404	3375	1292	79	$417.05
Census Tract 10, Allen County, Indiana	$35,729	9973	469	63	$161.93
Census Tract 11, Allen County, Indiana	$36,631	2499	943	81	$333.80
Census Tract 12, Allen County, Indiana	$20,417	8683	618	59	$121.93
Census Tract 13, Allen County, Indiana	$26,215	10725	631	54	$159.85
Census Tract 16, Allen County, Indiana	$23,209	3754	799	69	$179.20
Census Tract 17, Allen County, Indiana	$19,694	3388	698	83	$132.84
Census Tract 20, Allen County, Indiana	$27,581	5886	1296	123	$345.42
Census Tract 21, Allen County, Indiana	$27,788	6157	836	88	$224.49
Census Tract 22, Allen County, Indiana	$38,310	3971	1754	131	$649.34
Census Tract 23, Allen County, Indiana	$23,981	3936	1867	133	$432.66
Census Tract 25, Allen County, Indiana	$46,250	7692	1301	108	$581.46
Census Tract 26, Allen County, Indiana	$39,110	7862	1214	119	$458.81
Census Tract 28, Allen County, Indiana	$27,097	7907	776	72	$203.20
Census Tract 29, Allen County, Indiana	$23,924	4217	905	65	$209.22
Census Tract 30, Allen County, Indiana	$25,981	6117	1258	128	$315.84
Census Tract 31, Allen County, Indiana	$24,736	4595	1047	79	$250.27
Census Tract 32, Allen County, Indiana	$53,342	8703	2045	160	$1,054.13
Census Tract 33.01, Allen County, Indiana	$42,543	7855	1183	51	$486.34
Census Tract 33.04, Allen County, Indiana	$38,703	4501	1602	108	$599.15
Census Tract 34, Allen County, Indiana	$46,691	8113	1853	97	$836.06
Census Tract 35, Allen County, Indiana	$25,313	3061	1756	111	$429.54
Census Tract 36, Allen County, Indiana	$32,129	5493	2679	176	$831.77
Census Tract 37, Allen County, Indiana	$38,000	7153	1114	72	$409.07
Census Tract 38, Allen County, Indiana	$29,375	2362	1659	103	$470.93
Census Tract 39.01, Allen County, Indiana	$48,393	10970	1462	89	$683.69
Census Tract 39.02, Allen County, Indiana	$38,281	9761	1330	70	$492.00
Census Tract 40, Allen County, Indiana	$34,367	5693	1202	103	$399.19
Census Tract 41.01, Allen County, Indiana	$42,381	9370	930	58	$380.88
Census Tract 41.03, Allen County, Indiana	$46,181	10790	2618	170	$1,168.33
Census Tract 43, Allen County, Indiana	$20,972	3557	982	77	$199.01
Census Tract 44, Allen County, Indiana	$22,917	5001	1190	121	$263.53
Census Tract 103.04, Allen County, Indiana	$79,917	7519	2647	147	$2,044.20
Census Tract 106.01, Allen County, Indiana	$66,995	5068	1405	121	$909.60
Census Tract 106.02, Allen County, Indiana	$50,818	4666	1506	107	$739.56
Census Tract 106.03, Allen County, Indiana	$54,464	9350	718	40	$377.89
Census Tract 106.04, Allen County, Indiana	$27,839	4208	1142	96	$307.22
Census Tract 107.05, Allen County, Indiana	$57,933	8720	2200	116	$1,231.63
Census Tract 107.06, Allen County, Indiana	$60,000	3622	1860	93	$1,078.44
Census Tract 107.07, Allen County, Indiana	$68,078	10752	2349	120	$1,545.33
Census Tract 108.03, Allen County, Indiana	$60,217	6632	1996	77	$1,161.48
Census Tract 108.04, Allen County, Indiana	$53,377	5783	1764	63	$909.88
Census Tract 108.07, Allen County, Indiana	$53,456	3722	1762	92	$910.19
Census Tract 108.08, Allen County, Indiana	$78,945	7548	1929	84	$1,471.59
Census Tract 108.09, Allen County, Indiana	$50,741	8863	2094	126	$1,026.75
Census Tract 108.11, Allen County, Indiana	$65,383	15865	2165	175	$1,367.90
Census Tract 108.12, Allen County, Indiana	$65,011	4369	1779	75	$1,117.62
Census Tract 108.13, Allen County, Indiana	$56,169	9308	1683	97	$913.51
Census Tract 108.15, Allen County, Indiana	$75,659	6018	1811	99	$1,324.07
Census Tract 108.16, Allen County, Indiana	$78,568	7469	1907	94	$1,447.86
Census Tract 108.17, Allen County, Indiana	$57,819	9166	1520	72	$849.27
Census Tract 108.19, Allen County, Indiana	$40,745	7015	2308	116	$908.74
Census Tract 108.21, Allen County, Indiana	$36,954	7035	1986	122	$709.20
Census Tract 113.02, Allen County, Indiana	$33,571	9141	2052	186	$665.69
Census Tract 113.03, Allen County, Indiana	$36,071	16168	794	61	$276.76
Census Tract 115.01, Allen County, Indiana	$40,216	4884	1930	104	$750.04
Census Tract 115.02, Allen County, Indiana	$47,072	14760	1295	80	$589.07
Census Tract 9800.01, Allen County, Indiana	$12,500	2331	58	26	$7.01
Census Tract 9800.02, Allen County, Indiana					$0.00
Block Group 3, Census Tract 102.01, Allen County, Indi	$71,397	40443	479	89	$330.48
Block Group 4, Census Tract 102.01, Allen County, Indi	$88,237	8531	463	85	$394.79
Block Group 2, Census Tract 103.05, Allen County, Indi	$118,897	14130	819	102	$940.99
Block Group 4, Census Tract 103.05, Allen County, Indi	$102,500	62381	562	95	$556.66
Block Group 1, Census Tract 103.07, Allen County, Indi	$91,842	16969	410	71	$363.88
Block Group 2, Census Tract 103.07, Allen County, Indi	$83,574	5962	1101	101	$889.18
Block Group 1, Census Tract 103.08, Allen County, Indi	$90,962	10291	1482	143	$1,302.68
Block Group 1, Census Tract 113.04, Allen County, Indi	$56,065	12146	901	116	$488.14
Block Group 2, Census Tract 113.04, Allen County, Indi	$11,748	1515	717	123	$81.40
Block Group 2, Census Tract 116.07, Allen County, Indi	$62,019	9882	587	94	$351.80
Total, Service Area			103,483		$48,039.49
US					$57,652
Indiana					$52,182
Allen County					$51,091

Exhibit L-5 pg 2 of 2
Wayne Township
Median Household Income

S19

// Search / Tables / S1901

INCOME IN THE PAST 12 MONTHS (IN 2017 INFLATION-ADJUSTED DOLLARS)

Survey/Program: American Community Survey TableID: S1901 Product: 2017: ACS 1-Year Estimates Subject Tables

Data Notes | Selections | 1 Geography | Years | Topic | 1 Survey | Code | Hide | Filter | Sort | Transpose Table | Margin of Error | Restore Layout | Download | Print | Share | More Data | More

Wayne township, Allen County, Indiana

	Households		Families		Marrie
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Total	43,687	+/-1,887	22,494	+/-1,538	
Less than $10,000	8.2%	+/-2.0	6.3%	+/-2.8	
$10,000 to $14,999	8.1%	+/-2.0	5.7%	+/-2.5	
$15,000 to $24,999	18.3%	+/-3.2	14.4%	+/-4.0	
$25,000 to $34,999	13.9%	+/-2.8	9.1%	+/-2.8	
$35,000 to $49,999	15.2%	+/-2.4	16.5%	+/-3.3	
$50,000 to $74,999	18.4%	+/-2.9	24.9%	+/-4.5	
$75,000 to $99,999	11.2%	+/-2.1	14.1%	+/-3.2	
$100,000 to $149,999	5.0%	+/-1.6	6.4%	+/-2.3	
$150,000 to $199,999	1.1%	+/-0.5	1.7%	+/-1.0	
$200,000 or more	0.6%	+/-0.4	0.8%	+/-0.7	
Median income (dollars)	35,881	+/-2,664	47,818	+/-5,812	62,41
Mean income (dollars)	45,005	+/-2,634	52,977	+/-3,926	
PERCENT ALLOCATED					
Household income in ...	29.8%	(X)	(X)	(X)	
Family income in the ...	(X)	(X)	30.7%	(X)	
Nonfamily income in t...	(X)	(X)	(X)	(X)	

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Exhibit L-6: Full Control No Stormwater Costs

Exhibit L-6 pg 1 of 3 Full Control
No Stormwater Costs

Assumes a portion of projects are rate funded and does not include stormwater projects

City of Fort Wayne
EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 1: CALCULATION OF COST PER HOUSEHOLD
(2017 $ Value and FULL CONTROL SCENARIO)

See Section 1 of Appendix L

Description			Amount	EPA Line No.	Source
Current and Projected Wastewater Treatment and Wet-Weather Control Costs:					
Current WWT and Wet-Weather Control Costs:					
Annual O&M Expense - Sewer (excluding Depreciation)			$26,404,190	100	From 2017 Source: Comparative Statement of Revenues, Expenses, and Changes in Net Position
Annual Debt Service (Principal & Interest)			43,839,865	101	Based on the average debt service for the 7 years (2019-2025).Note, it excludes stormwater bonds
Subtotal			70,244,055	102	Calculation
Projected WWT and Wet-Weather Control Costs:					
Annual Rate Funded Capital Projects			27,346,166		Calculated as an average of sewer capital improvements
Expected increase in O&M due to new assets (as a % of capital assets)			13,709,020		Calculated as a percentage of capital assets - See Capital Projects Schedules. $13,709,020 from Sewer.
Annual Incremental O&M Expense without STORM			41,055,186	103	
Capital Cost of LTCP	$827,167,360				Capital Projects Schedules
Capital Cost of Wastewater Improvement CIP	239,470,850				Capital Projects Schedules
Subtotal	1,066,638,210				
Less: Total Rate Funded Wastewater Improvements	(191,423,165)				Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	(154,794,141)				
Subtotal	720,420,904				
Plus: 2.00% Acquisition Costs (Wastewater)	14,408,418				See Assumptions
Projected Debt Service (Wastewater)		64,065,828			Assumed $734,830,000 bond at 6.00% interest amortized over 20 Years.Assumed increments of $5,000
Capital Cost of Stormwater Improvement CIP	Not Included				See Capital Projects Schedules
Less: Total Rate Funded Stormwater Improvements	Not Included				See Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	Not Included				
Subtotal	Not Included				
2.00% Acquisition Costs (StormWater)	Not Included				See Assumptions
Projected Debt Service (StormWater)		Not Included			Stormwater is not included in current calculation.
Total Projected Debt Service (Principal & Interest)			64,065,828	104	Calculation
Subtotal			105,121,014	105	Calculation
Total Current and Projected WWT and Wet-Weather Control Costs without STORM			$175,365,069	106	Calculation
Allocation of WWT and Wet-Weather Costs to Residential Customers:					
Residential Flow as a Percentage of Total Flow			66.40%		Per Utility Analysis
Residential Share of Total WWT and Wet-Weather Control Costs			$116,442,406	107	Calculation
Determination of WWT and Wet-Weather Cost Per Household:					
Total Number of Residential Accounts in Service Area			81,796	108	Per Utility Customer Records
Cost Per Household - Sewer. No stormwater included.			$1,424	109	Calculation

See Section 2 of Appendix L

See Section 3 of Appendix L and Exhibit L-3 for Annual Costs and O&M Increase

See Section 3 of Appendix L and Exhibit L-3 for Capital Costs and Funding Breakdown

See Section 4 of Appendix L

See Section 5 of Appendix L

Exhibit L-6 pg 2 of 3 Full Control - No Stormwater MPS-WQS (Service Area)

Assumes a portion of projects are rate funded and does not include stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and FULL CONTROL SCENARIO)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI: Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$48,039	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) without STORM	$1,424	204	Calculation
Residential Indicator: (CPH as % of MHI)	**2.96%**	205	Calculation
Analysis of the Residential Indicator	**High**		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0-2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

Exhibit L-6 pg 3 of 3 Full Control - No Stormwater MPS-WQS (Wayne only)

Assumes a portion of projects are rate funded and does not include stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and FULL CONTROL SCENARIO)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI:			
Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$35,881	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) without STORM	$1,424	204	Calculation
Residential Indicator: (CPH as % of MHI)	**3.97%**	205	Calculation
Analysis of the Residential Indicator	**High**		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0-2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

Exhibit L-7: Full Control Includes Stormwater Costs

Exhibit L-7 pg 1 of 3 Full Control Includes Stormwater Costs

Assumes a portion of projects are rate funded and includes stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 1: CALCULATION OF COST PER HOUSEHOLD

(2017 $ Value and FULL CONTROL SCENARIO)

See Section 1 of Appendix L

Description		Amount	EPA Line No.	Source
Current and Projected Wastewater Treatment and Wet-Weather Control Costs:				
Current WWT and Wet-Weather Control Costs:				
Annual O&M Expense - Sewer and Storm (excluding Depreciation)		$31,727,451	100	From 2017 Source: Comparative Statement of Revenues, Expenses, and Changes in Net Position
Annual Debt Service (Principal & Interest)		45,984,922	101	Based on the average debt service for the 7 years (2019-2025).
Subtotal		77,712,373	102	Calculation
Projected WWT and Wet-Weather Control Costs:				
Annual Rate Funded Capital Projects		34,586,396		Calculated as an average of sewer capital improvements + average of stormwater capital improvements
Expected increase in O&M due to new assets (as a % of capital assets)		14,093,597		Calculated as a percentage of capital assets - See Capital Projects Schedules. $13,709,020 from Sewer and $384,577 from Storm.
Annual Incremental O&M Expense with STORM		48,679,993	103	
Capital Cost of LTCP	$827,167,360			Capital Projects Schedules
Capital Cost of Wastewater Improvement CIP	239,470,850			Capital Projects Schedules
Subtotal	1,066,638,210			
Less: Total Rate Funded Wastewater Improvements	(191,423,165)			Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	(154,794,141)			
Subtotal	720,420,904			
Plus: 2.00% Acquisition Costs (Wastewater)	14,408,418			See Assumptions
Projected Debt Service (Wastewater)		64,065,828		Assumed $734,830,000 bond at 6.00% interest amortized over 20 Years.Assumed increments of $5,000
Capital Cost of Stormwater Improvement CIP	67,160,863			See Capital Projects Schedules
Less: Total Rate Funded Stormwater Improvements	(50,681,610)			See Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	(16,479,253)			
Subtotal	0			
2.00% Acquisition Costs (StormWater)	0			See Assumptions
Projected Debt Service (StormWater)		0		Projects less allowances are assumed rate funded.
Total Projected Debt Service (Principal & Interest)		64,065,828	104	Calculation
Subtotal		112,745,821	105	Calculation
Total Current and Projected WWT and Wet-Weather Control Costs with STORM		$190,458,194	106	Calculation
Allocation of WWT and Wet-Weather Costs to Residential Customers:				
Residential Flow as a Percentage of Total Flow		66.40%		Per Utility Analysis
Residential Share of Total WWT and Wet-Weather Control Costs		$126,464,241	107	Calculation
Determination of WWT and Wet-Weather Cost Per Household:				
Total Number of Residential Accounts in Service Area		81,796	108	Per Utility Customer Records
Cost Per Household - Sewer and Storm		$1,546	109	Calculation

See Section 2 of Appendix L

See Section 3 of Appendix L and Exhibit L-3 for Annual Costs and O&M Increase

See Section 3 of Appendix L and Exhibit L-3 for Capital Costs and Funding Breakdown

See Section 3 of Appendix L and Exhibit L-4 for Capital Costs and Funding Breakdown

See Section 4 of Appendix L

See Section 5 of Appendix L

Exhibit L-7 pg 2 of 3 Full Control - w/ Stormwater MPS-WQS (Service Area)

Assumes a portion of projects are rate funded and includes stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and FULL CONTROL SCENARIO)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI: Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$48,039	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) with STORM	$1,546	204	Calculation
Residential Indicator: (CPH as % of MHI)	**3.22%**	205	Calculation
Analysis of the Residential Indicator	**High**		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0-2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

Exhibit L-7 pg 3 of 3 Full Control - w/ Stormwater MPS-WQS (Wayne only)

Assumes a portion of projects are rate funded and includes stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and FULL CONTROL SCENARIO)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI: Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$35,881	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) with STORM	$1,546	204	Calculation
Residential Indicator: (CPH as % of MHI)	**4.31%**	205	Calculation
Analysis of the Residential Indicator	**High**		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0-2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

Exhibit L-8: Approved LTCP No Stormwater Costs

Exhibit L-8 pg 1 of 3
Approved LTCP
No Stormwater Costs

Assumes a portion of projects are rate funded and does not include stormwater projects

City of Fort Wayne
EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 1: CALCULATION OF COST PER HOUSEHOLD
(2017 $ Value and APPROVED LTCP)

See Section 1 of Appendix L

Description			Amount	EPA Line No.	Source
Current and Projected Wastewater Treatment and Wet-Weather Control Costs:					
Current WWT and Wet-Weather Control Costs:					
Annual O&M Expense - Sewer (excluding Depreciation)			$26,404,190	100	From 2017 Source: Comparative Statement of Revenues, Expenses, and Changes in Net Position
Annual Debt Service (Principal & Interest)			43,839,865	101	Based on the average debt service for the 7 years (2019-2025).Note, it excludes stormwater bonds
Subtotal			70,244,055	102	Calculation
Projected WWT and Wet-Weather Control Costs:					
Annual Rate Funded Capital Projects			16,483,614		Calculated as an average of sewer capital improvements
Expected increase in O&M due to new assets (as a % of capital assets)			5,374,641		Calculated as a percentage of capital assets - See Capital Projects Schedules. $5,374,641 from Sewer.
Annual Incremental O&M Expense without STORM			21,858,255	103	
Capital Cost of LTCP	$241,724,068				Capital Projects Schedules
Capital Cost of Wastewater Improvement CIP	239,470,850				Capital Projects Schedules
Subtotal	481,194,918				
Less: Total Rate Funded Wastewater Improvements	(115,385,295)				Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	(154,794,141)				
Subtotal	211,015,482				
Plus: 2.00% Acquisition Costs (Wastewater)	4,220,310				See Assumptions
Projected Debt Service (Wastewater)		18,765,604			Assumed $215,240,000 bond at 6.00% interest amortized over 20 Years.Assumed increments of $5,000
Capital Cost of Stormwater Improvement CIP	Not Included				See Capital Projects Schedules
Less: Total Rate Funded Stormwater Improvements	Not Included				See Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	Not Included				
Subtotal	Not Included				
2.00% Acquisition Costs (StormWater)	Not Included				See Assumptions
Projected Debt Service (StormWater)		Not Included			Stormwater is not included in current calculation.
Total Projected Debt Service (Principal & Interest)			18,765,604	104	Calculation
Subtotal			40,623,859	105	Calculation
Total Current and Projected WWT and Wet-Weather Control Costs without STORM			$110,867,914	106	Calculation
Allocation of WWT and Wet-Weather Costs to Residential Customers:					
Residential Flow as a Percentage of Total Flow			66.40%		Per Utility Analysis
Residential Share of Total WWT and Wet-Weather Control Costs			$73,616,295	107	Calculation
Determination of WWT and Wet-Weather Cost Per Household:					
Total Number of Residential Accounts in Service Area			81,796	108	Per Utility Customer Records
Cost Per Household - Sewer. No stormwater included.			$900	109	Calculation

See Section 2 of Appendix L

See Section 3 of Appendix L and Exhibit L-2 for Annual Costs and O&M Increase

See Section 3 of Appendix L and Exhibit L-2 for Capital Costs and Funding Breakdown

See Section 4 of Appendix L

See Section 5 of Appendix L

Exhibit L-8 pg 2 of 3 L
TCP - No Stormwater
MPS-LTCP (Service Area)

Assumes a portion of projects are rate funded and does not include stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and APPROVED LTCP)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI: Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$48,039	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) without STORM	$900	204	Calculation
Residential Indicator: (CPH as % of MHI)	**1.87%**	205	Calculation
Analysis of the Residential Indicator	**Mid-Range**		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	**1.0-2.0 Percent of MHI**
High	Greater than 2.0 Percent of MHI

Exhibit L-8 pg 3 of 3 L
TCP - No Stormwater
MPS-LTCP (Wayne only)

Assumes a portion of projects are rate funded and does not include stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and APPROVED LTCP)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI: Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$35,881	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) without STORM	$900	204	Calculation
Residential Indicator: (CPH as % of MHI)	2.51%	205	Calculation
Analysis of the Residential Indicator	High		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0-2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

Exhibit L-9: Approved LTCP Includes Stormwater Costs

Exhibit L-9 pg 1 of 3
Approved LTCP Includes Stormwater Costs

Assumes a portion of projects are rate funded and includes stormwater projects

City of Fort Wayne
EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 1: CALCULATION OF COST PER HOUSEHOLD
(2017 $ Value and APPROVED LTCP)

See Section 1 of Appendix L

Description			Amount	EPA Line No.	Source
Current and Projected Wastewater Treatment and Wet-Weather Control Costs:					
Current WWT and Wet-Weather Control Costs:					
Annual O&M Expense - Sewer and Storm (excluding Depreciation)			$31,727,451	100	From 2017 Source: Comparative Statement of Revenues, Expenses, and Changes in Net Position
Annual Debt Service (Principal & Interest)			45,984,922	101	Based on the average debt service for the 7 years (2019-2025).
Subtotal			77,712,373	102	Calculation
Projected WWT and Wet-Weather Control Costs:					
Annual Rate Funded Capital Projects			23,723,844		Calculated as an average of sewer capital improvements + average of stormwater capital improvements
Expected increase in O&M due to new assets (as a % of capital assets)			5,759,218		Calculated as a percentage of capital assets - See Capital Projects Schedules. $5,374,641 from Sewer and $384,577 from Storm.
Annual Incremental O&M Expense with STORM			29,483,062	103	
Capital Cost of LTCP	$241,724,068				Capital Projects Schedules
Capital Cost of Wastewater Improvement CIP	239,470,850				Capital Projects Schedules
Subtotal	481,194,918				
Less: Total Rate Funded Wastewater Improvements	(115,385,295)				Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	(154,794,141)				
Subtotal	211,015,482				
Plus: 2.00% Acquisition Costs (Wastewater)	4,220,310				See Assumptions
Projected Debt Service (Wastewater)		18,765,604			Assumed $215,240,000 bond at 6.00% interest amortized over 20 Years.Assumed increments of $5,000
Capital Cost of Stormwater Improvement CIP	67,160,863				See Capital Projects Schedules
Less: Total Rate Funded Stormwater Improvements	(50,681,610)				See Capital Projects Schedules
Less: Improvements Funded by Existing Bonds & Reimbursements	(16,479,253)				
Subtotal	0				
2.00% Acquisition Costs (StormWater)	0				See Assumptions
Projected Debt Service (StormWater)		0			Projects less allowances are assumed rate funded.
Total Projected Debt Service (Principal & Interest)			18,765,604	104	Calculation
Subtotal			48,248,666	105	Calculation
Total Current and Projected WWT and Wet-Weather Control Costs with STORM			$125,961,039	106	Calculation
Allocation of WWT and Wet-Weather Costs to Residential Customers:					
Residential Flow as a Percentage of Total Flow			66.40%		Per Utility Analysis
Residential Share of Total WWT and Wet-Weather Control Costs			$83,638,130	107	Calculation
Determination of WWT and Wet-Weather Cost Per Household:					
Total Number of Residential Accounts in Service Area			81,796	108	Per Utility Customer Records
Cost Per Household - Sewer and Storm			$1,023	109	Calculation

See Section 2 of Appendix L

See Section 3 of Appendix L and Exhibit L-2 for Annual Costs and O&M Increase

See Sect ion 3 of Appendix L and Exhibit L-2 for Capital Costs and Funding Breakdown

See Section 3 of Appendix L and Exhibit L- 4 for Capital Costs and Funding Breakdown

See Section 4 of Appendix L

See Section 5 of Appendix L

Exhibit L-9 pg 2 of 3
LTCP - w/ Stormwater
MPS-LTCP (Service Area)

Assumes a portion of projects are rate funded and includes stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and APPROVED LTCP)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI:			
Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$48,039	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) with STORM	$1,023	204	Calculation
Residential Indicator: (CPH as % of MHI)	**2.13%**	205	Calculation
Analysis of the Residential Indicator	**High**		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0-2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

Exhibit L-9 pg 3 of 3 L
TCP - w/ Stormwater
MPS-LTCP (Wayne only)

Assumes a portion of projects are rate funded and includes stormwater projects

City of Fort Wayne

EPA CSO FINANCIAL CAPABILITY ASSESSMENT - PHASE 1 THE RESIDENTIAL INDICATOR

WORKSHEET 2: CALCULATION OF THE RESIDENTIAL INDICATOR

(2017 $ Value and APPROVED LTCP)

Description	Amount	EPA Line No.	Source
Adjusted Median Household Income Levels			
Using Weighted Average MHI: Census Year MHI	NA	201	Not Applicable
Adjustment Factor	NA	202	Not Applicable
Adjusted MHI	$35,881	203	Source: 2017 American Community Survey Estimate
Annual WWT and Wet-Weather Control Cost Per Household (CPH) with STORM	$1,023	204	Calculation
Residential Indicator: (CPH as % of MHI)	**2.85%**	205	Calculation
Analysis of the Residential Indicator	**High**		

See Section 6 of Appendix L

Financial Impact	Residential Indicator (CPH as % MHI)
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0-2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

APPENDIX M: Precision of Cost Estimating for CSO Control Measures

Preliminary cost estimates were prepared for various CSO control measures as part of the LTCP development effort to serve as a selection criterion among prospective alternative control measures. For more detailed information on the cost estimating methodology, *see* Attachment 1 to the LTCP titled, "Cost Estimating Methodology." The primary method for cost-estimating was the use of parametric models, developed from a series of recent planning-level cost estimating analyses conducted in the Midwest along with USEPA and industry references.

The Association for the Advancement of Cost Engineering (AACE) International has developed a Cost Estimate Classification System, which is summarized as follows:

> *"The Cost Estimate Classification System provides guidelines for applying the general principles of estimate classification to asset project cost estimates. Asset project cost estimates typically involve estimates for capital investment and exclude operating and life-cycle evaluations. The Cost Estimate Classification System maps the phases and stages of asset cost estimating together with a generic maturity and quality matrix that can be applied across a wide variety of industries."*

AACE's Cost Estimate Classification System is shown below. Given the purpose and characteristics of the preliminary cost estimates developed for the LTCP, the City's cost estimates fall in AACE Class 4. The most accurate estimates in this Class are expected to range from approximately -15% to +20%, while some estimates in this Class could range from approximately -30% to +50%. These accuracy ranges are analogous to degrees of uncertainty in the City's cost estimates.

AACE Cost Estimate Classification System

	Primary Characteristic	*Secondary Characteristic*			
ESTIMATE CLASS	**LEVEL OF PROJECT DEFINITION** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Cost Estimate Classification System
(from AACE International Recommended Practices and Standards,

APPENDIX N-1: Public Participation Meetings February 17, 2010

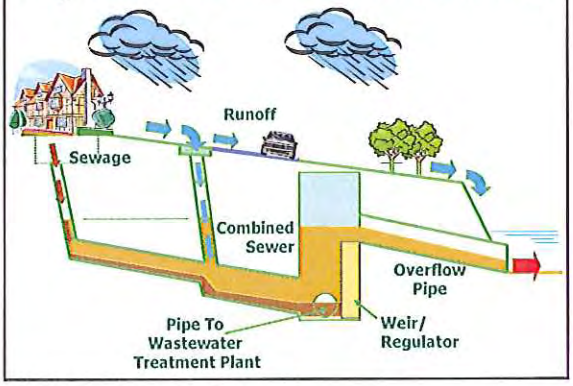
City of Fort Wayne
Use Attainability Analysis

February 17, 2010
Brandi Wallace
Justin Brugger
Todd Trinkle (IDEM)

Presentation Outline

- Water Quality Impacts of CSO Overflows
- Reducing Overflows
  - Long-Term Control Plan (LTCP)
  - Benefits of LTCP
- Request for Recreational Use Change in Water Quality Standards
- Basis for Use Attainability Analysis
- Next Steps

Why Our Combined Sewers Overflow



We Are Not Alone!

- Nationwide problem, especially in Midwest and Northeast

Where Sewers Overflow

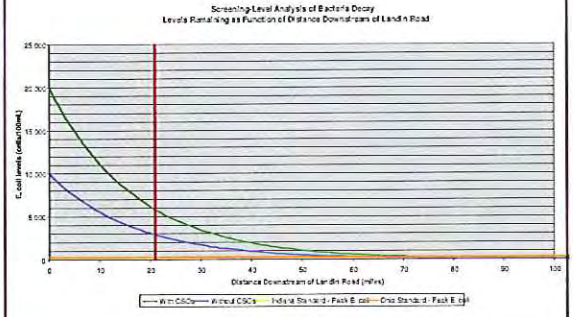
- Maumee
- St. Joseph
- St. Mary's
- Spy Run Creek
- Baldwin Ditch
- Other tributaries

Water Quality Problems

- Maumee River, St. Joseph River, St. Mary's River impaired by bacteria, according to IDEM
- On average, waterways exceed *E. coli* standards 85 days per year

- Many sources of waterborne bacteria: Combined sewer overflows, failing septic systems, urban stormwater, agricultural runoff and, rarely, overflows from sanitary sewers

Modeled Bacteria Decay



Plan (LTCP) Overview

Program Element	Cost (millions)
Combined Sewer Capacity (partial sewer separation)	$68.3
Interceptor sewers	$72.4
Satellite storage/treatment	$34.8
Combined sewer overflow pond storage improvements	$53.9
Treatment plant improvements	$10
Total Cost	**$239.4**

(All cost estimates based on 2005 dollar value)

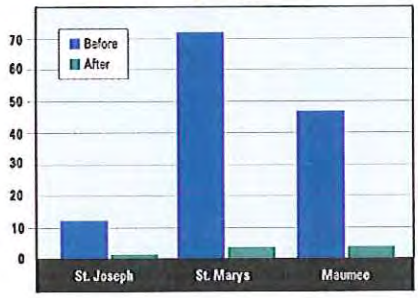
Benefits of City's Plan

- Reduced odors, untreated sewage and trash in our rivers and streams
- Reduces annual sewer overflow volume by 91 percent
- Reduces overflow frequency from 71 times in a typical year to:
  - 1 storm per year causing overflows to St. Joseph River*
  - 4 storms per year causing overflows to St. Mary's and Maumee rivers*
- Reduced bacteria in our waterways

*Predictions based on a year with average rainfall

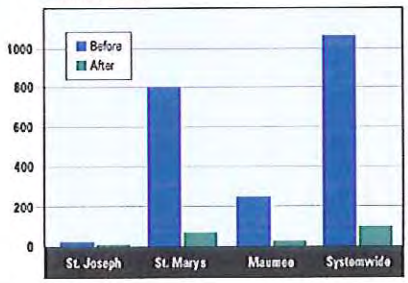
Benefits: Reduced Overflow Frequency

Annual Overflow Frequency in a Typical Year



Benefits: Reduced Overflow Volume

Annual Overflow Volume in a Typical Year
(million gallons)



- Controls go beyond the point of diminishing returns from a cost-effectiveness perspective.
- Even if all CSOs were eliminated, Fort Wayne's receiving streams will not appear or be pristine. (Clay soils result in rivers appearing murky).
- Stormwater from the City and surrounding area will still run into waterways carrying pollutants, including bacteria, and sediment.