

## USEPA watershed-based plan element #2: water quality improvement expected from implementing plan recommendations (also see Chapter 6)

### appendix K - watershed pollutant loading and plan implementation pollutant loading estimates

This appendix includes a variety of tables containing information pertaining to watershed pollutant loading and reduction estimates. Table K1 presents non-point source pollutant loading estimates by subbasin for 12 common pollutants. Table K2 presents pollutant loading assumptions by land use category, and Table K3 presents the assumed land use category used for estimating pollutant loading for the land use categories provided by each municipality. The relative contribution of each of the 12 pollutants presented in Table K1 is displayed on the maps in Appendix M.

Tables K4 through K9 present the estimated pollutant load / impairment reductions expected for implementing the recommendations in the action plan of Chapter 5. Pollutant and impairment reduction projections are best estimates and/or ranges of impairment reduction that can be achieved for recommended actions for the quantities (e.g., acres, linear feet of stream) indicated. Impairment reduction estimates, whether indicated as quantities, as ranges of percentages, or as an estimated ability to meet reduction targets, are based on a variety of studies examining the potential effectiveness of different actions and best management practices. Results from the various studies are included in Tables K10 to K18.

Impairment reduction targets are indicated in Tables K4 through K9 in two ways and are based on professional opinion of feasibility. First, Impairment Reduction Targets indicate the potential reduction of the indicated impairment based on full (100%) implementation of the recommended action. For example, if all of the recommended actions intended to address sediment Total Suspended Solids were to be fully implemented, then 75% of the sediment / Total Suspended Solids impairment, or problem, can reasonably be expected to be addressed. In other words, even under the best conditions, the entire sediment / Total Suspended Solids problem could not be addressed because it is likely that there will always be some erosion and runoff of sediment from the urban landscape into the stream. Nonetheless, a 75% reduction in Total Suspended Solids / sediment loading would be a successful achievement for watershed improvement.

Area Improvement Targets indicate the area that can reasonably be expected to be addressed by each of the recommended actions. For example, many of the wetland restoration recommendations have an Area Improvement Target of 75%, indicating that 75% of the wetland can reasonably be expected to be restored to a healthy condition. For wetlands, an improvement of 100% is considered unattainable given the hydrologic and stormwater issues of the watershed.

Impairment Reduction Projections are best estimates and/or ranges of impairment reduction that can be achieved for recommended actions for the quantities (e.g., acres, linear feet of stream) indicated. Impairment reduction estimates, whether indicated as quantities, as ranges of percentages, or as an estimated ability to meet reduction targets, are based on a variety of studies examining the potential effectiveness of different actions and best management practices to improve watershed resources. Where actual figures in pounds per year (lbs/yr) are shown for Total Suspended Solids / sediment and for phosphorous, these figures represent expected load reductions for these two constituents. Figures are estimated based on research of the practices and the recommended area to be treated. Where a range of percentages is shown, this range indicates the broadest possible range of effectiveness based on research. Properly installed and implemented practices can be expected to reduce the impairment by a percentage within the range indicated. Where a 1, 2, or 3 is indicated, these numbers represent the potential ability to meet reduction target using a three-point scale where 1 represents 0-33% effective, 2 represents 34-66% effective, and 3 represents 67-100% effective. These rankings are based on both research and professional opinion of the planning team.

# appendix K - watershed pollutant loading and plan implementation pollutant loading reduction estimates

Table K.1. Dead River Subwatershed Pollutant Loading

Subbasin	Acres	TSS	TP	COD	BOD	TDS	TN	TKN	DP	Cad	Lead	Cop	Zn
		(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac
1	137	1.06	945	367	29.90	2208	7.76	7.63	0.23	0.01	0.97	0.20	1.45
2	534	0.70	576	231	22.04	1332	5.68	4.56	0.19	0.00	0.55	0.12	0.87
3	36	0.82	688	266	21.97	1611	5.71	5.68	0.18	0.01	0.69	0.15	1.06
4	171	0.83	666	244	24.03	1278	6.02	5.22	0.22	0.00	0.58	0.12	0.97
5	12	0.28	218	91	4.86	742	1.33	2.03	0.04	0.00	0.24	0.05	0.31
6	114	0.62	447	174	16.08	1012	4.24	3.76	0.15	0.00	0.43	0.09	0.73
7	132	0.51	394	128	12.66	674	4.35	2.96	0.16	0.00	0.25	0.06	0.48
8	246	0.56	435	115	14.94	716	4.40	2.25	0.26	0.01	0.52	0.08	0.51
9	45	0.86	554	228	23.63	1172	6.30	5.00	0.22	0.00	0.55	0.11	1.11
10	252	0.92	804	273	27.39	1613	7.44	5.40	0.31	0.01	0.90	0.16	1.12
11	84	1.00	767	311	29.09	1728	7.63	6.44	0.25	0.01	0.78	0.16	1.35
12	39	0.13	23	16	0.47	249	0.22	0.47	0.03	0.00	0.01	0.00	0.03
13	167	1.04	882	331	32.60	1811	8.39	6.63	0.30	0.01	0.86	0.17	1.32
14	130	0.79	656	243	23.12	1455	6.22	4.92	0.23	0.01	0.73	0.14	1.01
15	87	0.83	696	171	24.21	960	7.09	3.21	0.42	0.01	0.85	0.12	0.79
16	228	0.59	463	175	16.58	1047	4.33	3.60	0.16	0.00	0.46	0.09	0.69
17	90	0.44	340	96	11.21	629	3.21	1.94	0.19	0.01	0.38	0.06	0.39
18	21	0.62	466	106	17.08	615	5.17	1.94	0.33	0.01	0.59	0.08	0.52
19	5	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
20	193	0.34	210	54	7.49	400	2.31	1.08	0.16	0.00	0.25	0.03	0.24
21	123	0.14	32	20	0.67	271	0.27	0.54	0.03	0.00	0.02	0.00	0.05
22	21	0.37	274	114	8.46	776	2.31	2.52	0.07	0.00	0.29	0.06	0.46
23	140	0.20	86	48	5.23	387	1.35	0.81	0.07	0.00	0.06	0.01	0.12
24	114	0.27	123	60	6.59	394	1.79	1.21	0.08	0.00	0.10	0.02	0.24
25	249	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
26	82	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
27	92	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
28	205	0.68	531	127	18.83	746	5.64	2.37	0.35	0.01	0.67	0.09	0.61
29	50	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
30	112	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
31	415	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
32	136	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
33	186	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
34	153	0.60	446	163	15.68	951	4.63	3.52	0.18	0.00	0.45	0.09	0.71
35	7	0.20	74	37	2.58	344	0.77	0.90	0.05	0.00	0.06	0.01	0.14
36	97	0.70	503	197	18.97	1087	4.94	4.30	0.17	0.00	0.48	0.10	0.86
37	138	0.28	136	61	3.72	573	1.19	1.43	0.06	0.00	0.13	0.03	0.20
38	174	0.60	425	139	17.78	778	4.98	2.64	0.25	0.01	0.48	0.08	0.62
39	96	0.75	627	212	25.49	953	6.01	4.19	0.25	0.00	0.41	0.09	0.68
40	15	1.04	1221	468	28.19	3212	7.32	9.91	0.12	0.01	1.44	0.30	1.73

Table K.1. Dead River Subwatershed Pollutant Loading (continued)

Subbasin	Acres	TSS	TP	COD	BOD	TDS	TN	TKN	DP	Cad	Lead	Cop	Zn
		(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac	(lb/yr)/ac
41	141	0.66	447	154	18.10	854	5.06	3.20	0.24	0.01	0.49	0.09	0.73
42	97	0.78	518	212	20.78	1157	5.55	4.57	0.20	0.00	0.51	0.11	0.99
43	121	0.80	614	257	29.66	1330	7.49	4.66	0.26	0.00	0.58	0.12	0.98
44	34	0.70	503	145	19.97	734	5.68	2.90	0.30	0.01	0.56	0.09	0.70
45	19	0.75	474	174	20.20	907	5.59	3.74	0.24	0.01	0.50	0.09	0.87
46	156	0.49	380	148	11.66	995	3.20	3.17	0.12	0.00	0.42	0.08	0.60
47	11	0.33	245	84	8.32	496	2.01	1.83	0.10	0.00	0.16	0.04	0.26
48	63	0.91	705	282	26.26	1579	6.82	5.97	0.22	0.01	0.71	0.15	1.21
49	201	0.51	343	127	13.58	663	3.56	2.79	0.15	0.00	0.26	0.06	0.52
50	98	0.56	346	141	15.43	741	4.04	3.04	0.16	0.00	0.31	0.06	0.64
51	280	0.70	505	205	18.82	1156	5.01	4.47	0.16	0.00	0.52	0.11	0.93
52	99	0.57	410	164	15.61	900	4.19	3.58	0.14	0.00	0.40	0.08	0.74
53	131	0.59	364	151	16.04	801	4.49	3.26	0.16	0.00	0.33	0.07	0.70
54	50	0.62	505	188	17.91	1017	4.56	4.04	0.16	0.00	0.46	0.10	0.76
55	31	0.53	421	176	15.57	1050	4.12	3.62	0.12	0.00	0.45	0.09	0.72
56	439	0.50	428	166	13.61	1068	3.84	3.47	0.12	0.00	0.45	0.09	0.64
57	168	0.87	817	283	26.57	1530	6.43	5.92	0.23	0.01	0.68	0.15	0.98
58	174	0.37	236	102	10.44	598	2.77	2.08	0.10	0.00	0.22	0.05	0.42
59	100	1.00	784	297	28.21	1611	7.32	6.29	0.26	0.01	0.72	0.15	1.23
60	215	0.83	547	204	23.65	943	6.21	4.43	0.25	0.00	0.43	0.09	0.91
61	108	0.65	574	228	18.77	1398	5.15	4.75	0.14	0.00	0.59	0.12	0.89
62	39	0.68	308	129	16.18	613	4.93	3.02	0.20	0.00	0.23	0.05	0.69
63	69	0.99	827	318	28.07	1802	7.25	6.74	0.23	0.01	0.82	0.17	1.32
64	192	0.84	644	264	24.57	1509	6.59	5.41	0.21	0.01	0.65	0.14	1.12
65	197	0.67	436	162	17.71	850	4.89	3.56	0.20	0.00	0.38	0.08	0.73
66	355	0.64	416	170	17.41	935	4.69	3.65	0.17	0.00	0.42	0.09	0.79
67	106	0.43	320	96	10.30	481	3.88	2.30	0.15	0.00	0.20	0.04	0.38
68	123	0.15	36	22	1.25	259	0.43	0.58	0.04	0.00	0.02	0.01	0.07
69	209	1.08	1303	508	29.40	3496	7.55	10.78	0.10	0.01	1.54	0.32	1.86
70	97	0.25	128	55	4.33	437	1.21	1.29	0.06	0.00	0.12	0.02	0.21
71	91	0.80	534	221	21.43	1209	5.73	4.85	0.19	0.00	0.55	0.11	1.05
72	263	0.70	529	211	18.71	1236	4.92	4.47	0.17	0.00	0.52	0.11	0.89
73	38	0.91	647	245	30.16	1257	8.04	4.57	0.33	0.01	0.68	0.12	1.07
74	59	0.81	638	157	25.51	837	7.44	2.64	0.44	0.01	0.79	0.11	0.73
75	232	1.05	942	291	34.28	1759	9.40	5.17	0.45	0.01	1.12	0.19	1.15
76	204	0.92	799	209	26.57	1233	7.80	3.99	0.43	0.01	1.00	0.15	0.95
77	60	0.13	20	15	0.40	241	0.20	0.44	0.03	0.00	0.01	0.00	0.03
Total	7896	44.8	33583	12356	1210	73580	328	258	13.2	0.33	34.0	6.6	51.1

## appendix K - watershed pollutant loading and plan implementation pollutant loading reduction estimates

Table K.2. Pollutant Loading Assumptions by Land Use Category

	TSS		TP		COD		BOD		TDS		TN
	Sewered	Unsewered	Sewered	Unsewered	Sewered	Unsewered	Sewered	Unsewered	Sewered	Unsewered	Sewered
	(lbs/Ac/ Yr)		(lbs/Ac/ Yr)		(lbs/Ac/Yr)		(lbs/Ac/ Yr)		(lbs/Ac/ Yr)		(lbs/Ac/Yr)
Commercial	1180	1040	1.3	1.2	589	520	85	75	2830	2500	21
Industrial	1240	1080	1.5	1.3	260	230	50	40	1290	1130	14
Institutional	1320	790	1.4	0.8	320	190	52	31	623	374	11
Transportation	2260	1330	1.8	1.1	881	518	50	30	6060	3565	13
Multi-Family	1320	1050	1.4	1.1	320	260	52	42	623	498	11
Residential	309	154	0.81	0.4	140	71	22	11	436	218	6
Agricultural	307	307	0.36	0.36	55	55	6	6	178.4	178.4	4.8
Vacant	100	40	0.22	0.088	64	26	2	0.9	1210	483	1
Open Space	61	20	0.39	0.13	46	15	1	0.4	724	241	1
*Use Unsewered values for all residential parcels											

	TKN		DP		Cad		Lead		Cop		Zn	
Unsewered	Sewered	Unsewered	Sewered	Unsewered	Sewered	Unsewered	Sewered	Unsewered	Sewered	Unsewered	Sewered	Unsewered
	(lbs/Ac/ Yr)		(lbs/Ac/ Yr)		(lbs/Ac/ Yr)		(lbs/Ac/ Yr)		(lbs/Ac/ Yr)		(lbs/Ac/ Yr)	
18	6.9	6.1	0.69	0.61	0.008	0.0071	1.03	0.909	0.2	0.18	1.6	1.4
12	4	4	0.86	0.75	0.025	0.022	1.58	1.39	0.21	0.18	1.3	1.2
6.5	6.4	3.8	0.61	0.36	0.0037	0.0022	0.367	0.22	0.1	0.061	0.57	0.34
7.7	18	11	0.2	0.1	0.021	0.012	2.67	1.57	0.56	0.33	3.2	1.9
8.6	6.4	5.1	0.61	0.48	0.0037	0.003	0.367	0.294	0.1	0.081	0.57	0.46
3.1	3.2	1.6	0.26	0.13	0.002	0.001	0.234	0.117	0.048	0.024	0.9	0.45
4.8	1.82	1.82	0.17	0.17	0.0003	0.0003	0.005	0.005	0.0088	0.0088	0.138	0.138
0.5	2.2	0.88	0.1	0.05	0.0003	0.0001	0.027	0.011	0.01	0.004	0.1	0.06
0.2	1.3	0.44	0.08	0.03	0.0002	0.0001	0.016	0.0054	0.01	0.002	0.08	0.03

Table K.3. Land Use Categories Used for Pollution Loading Estimates

WI landuse types	Assumed Type
Agriculture	Agriculture
Forest/ grassland	Open Space
Multi-family Residential	Residential
Open Water	Open Space
Public and Private Open Space	Open Space
Retail/ Commercial	Commercial
Single Family Residential	Residential
Transportation	Transportation
Wetlands	Open Space
IL Landuse Types	Assumed Type
Agricultural	Agricultural
Forest and Grassland	Open Space
Government and Institutional	Institutional
Industrial	Industrial
Multi Family	Residential
Office	Commercial
Public and Private Open Space	Open Space
Retail/ Commercial	Commercial
Single Family	Residential
Transportation	Transportation
Utility and Waste Facilities	Industrial
Water	Open Space
Wetlands	Open Space

Table K.4. City of Zion Plan Implementation Pollutant Load Reduction Estimates

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
1.0.1	Zion	<i>Preserve Category 1 and 2 green infrastructure open space areas to connect the North and South units of Illinois Beach State Park, enhance recreational opportunities, and expand and restore important rare habitat. Decommission and remove the power plant and associated structures. Acreage count includes private / utility owned land within the area. It is assumed that restoration would address the potential pollutant loading hotspots identified as Critical Subbasins #15 and #74.</i>	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2.0.3	Zion	<i>Manage / minimize runoff impacts of commercial land uses along Sheridan Road, particularly at Sheridan and 33rd St and Sheridan and 27th, 28th, and 29th along the stream. Cost estimate assumes 8400 lf of Sheridan Road frontage treated with improved, 10' swales (approximately 2 acres) as a proxy for on-site source control BMPs.</i>	100%	4,620	5	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
2.0.6	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address algae / nutrient loads and turbidity / sedimentation by naturalizing the basin; remove excess debris.	100%	883	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
2.0.7	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address turbidity / sedimentation by naturalizing the basin; remove excess debris. This is depressional area #54.	100%	1,606	3	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
2.0.8	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address algae / nutrient loads by naturalizing the basin; remove excess debris. 100%		1,686	3	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
2.0.9	Zion	Address algae / nutrient loads by naturalizing the basin.	100%	1	3	3	NA	1	1	NA	NA	1	1	NA	NA	NA	NA
2.28.1	Zion	Restore stream channel and improve instream habitat by installing pools and riffles. 25%		1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
2.28.2	Zion	<i>Restore and manage the channel, native riparian buffers, and ravine woodland system, particularly the reach running through Ophir Park west of Sheridan Road, and Carmel Park east of Sheridan Road. Management practices include controlling invasive species, planting native species, and managing vegetation such as through prescribed burning.</i>	100%	4,336	7	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2

Table K.4. City of Zion Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
2.28.3	Zion	<i>Stabilize and reduce downcutting of the incised channel through Ophir Park, and install a naturalized riparian buffer. Cost estimate assumes stabilization of streambanks with Moderate erosion problem.</i>	100%	29,700	14	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
2.28.4	Zion	Manage the culvert outflow at the upstream end of the reach for energy dissipation and pollutant removal, possibly with a settling basin or small constructed wetland.	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
2.28.5	Zion	<i>Stabilize Moderate streambank erosion along the entire reach using bioengineering stabilization measures, which will help reduce the instream silt / sedimentation load within this reach.</i>	100%	106,920	49	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
2.28.6	Zion	Remove debris, tires, and logs using American Fisheries Society guidelines.	100%	54	0	30-50%BOD	62-75% HC; 14-71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
2.28.7	Zion	Remove debris obstructing flow using American Fisheries Society guidelines.	100%	54	0	30-50%BOD	62-75% HC; 14-71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
2.28.8	Zion	Remove concrete debris and remove or repair failed headwall and outfall pipe.	100%	54	0	30-50%BOD	62-75% HC; 14-71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
2.28.9	Zion	<i>Stabilize major erosion, bank slumping / blowout, and headwall failure at upstream end of the reach near the culvert. Use bioengineering stabilization measures if possible, and more structural measures if necessary. Cost estimate reflects stabilization of severe erosion problem.</i>	100%	130	0	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
2.28.10	Zion	<i>Stabilize 4 foot diameter plunge pool erosion below outfall. If feasible use bioengineering measures, though rip rap and structural measures may be necessary.</i>	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
2.28.11	Zion	<i>Stabilize bank erosion caused by stormwater outfall using bioengineering stabilization measures.</i>	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
2.28.12	Zion	Inspect and, if necessary, repair five culverts under trail, which may be crushed and/or failing.	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.0.3	Zion	Preserve approximately 21 acres of wetland and stream corridor open and partially open Category 1 green infrastructure areas and greenways within the headwaters of the 27th St tributary. Target areas are located (1) southwest of 25th St and Galilee, (2) south of Jethro and 26th Street, (3) west of 26th and Lewis, (4) southeast of 26th and Lewis, (5) northwest of 29th and Lewis.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table K.4. City of Zion Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3a.0.7	Zion	Manage the golf course grounds and detention / water features in Shiloh Park, in the northeast corner of the SMU for water quality and habitat benefits, including installation of a 5 foot riparian buffer along shoreline / banks of water features.	100%	1,847	3	30-50%BOD	62-75% HC; 14-71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3a.0.8	Zion	FPAI site 20-13 experiences local drainage problems due to runoff from the west. Retrofit David Park and the school property west of the problem area with detention or infiltration practices to reduce runoff rate and volume.	100%	2	NA	NA	NA	NA	NA	2	NA	NA	NA	NA	3	1	NA
3a.0.9	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a minimum 5 ft buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address turbidity / sedimentation by naturalizing the basin.	100%	281	0	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3a.0.10	Zion	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3a.0.11	Zion	Retrofit as wet / wetland basin; plant banks and a minimum 5 ft surrounding buffer with native vegetation.	100%	241	0	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3a.0.12	Zion	Retrofit as wet / wetland basin; plant banks and a minimum 5 ft surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; remove excess debris.	100%	321	1	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3a.0.13	Zion	Retrofit as wet / wetland basin; plant banks and a minimum 5 ft surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; retrofit bottom concrete channel.	100%	321	1	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3a.0.14	Zion	Plant banks and a minimum 5 ft surrounding buffer with native vegetation; remove excess debris.	100%	562	1	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3a.0.15	Zion	Stabilize / regrade shoreline using bioengineering practices and native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address algae / nutrient loads by naturalizing the basin; remove excess debris.	100%	610	1	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3a.0.16	Zion	Stabilize / regrade shoreline and plant banks and a minimum 5 ft surrounding buffer with native vegetation; address turbidity / sedimentation.	100%	642	1	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3a.0.17	Zion	Plant banks and a minimum 5 ft surrounding buffer with native vegetation; address turbidity / sedimentation by naturalizing the basin.	100%	1,124	2	30-50%BOD	62-75% HC; 14-71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA



Table K.4. City of Zion Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3a.27.1	Zion	Restore and manage the native riparian buffer plant communities along this reach within Sharon Park by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. A wider, partially forested buffer may be appropriate in the lower parts of the reach.	100%	3,212	5	30-50%BOD	62-75% HC; 14-71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3a.27.2	Zion	Address High streambank erosion along entire reach using bioengineering stabilization measures, some of which may threaten buried sewer lines.	100%	518,400	216	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.27.3	Zion	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30-50%BOD	62-75% HC; 14-71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3a.27.4	Zion	<i>Remediate significant erosion and slumping on left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream.</i>	100%	12,960	5	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.27.5	Zion	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30-50%BOD	62-75% HC; 14-71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3a.27.6	Zion	<i>Stabilize significant erosion and exposure of manhole and sewer infrastructure using bioengineering stabilization measures and other hardscape solutions to ensure protection of the infrastructure elements. Length difficult to determine from photo; assume 100 lf for cost estimation purposes.</i>	100%	12,960	5	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.27.7	Zion	<i>Stabilize erosion creating open channel at discharge point using bioengineering stabilization measures.</i>	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.27.8	Zion	<i>Remediate significant erosion and slumping on left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 150 lf for cost estimation purposes.</i>	100%	19,440	8	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.27.9	Zion	<i>Stabilize erosion at outfall that is creating an open channel using bioengineering stabilization measures.</i>	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.27.10	Zion	<i>Stabilize major erosion, headwall, and outfall pipe failure using bioengineering stabilization measures.</i>	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.27.11	Zion	<i>Stabilize minor channel erosion using bioengineering stabilization measures.</i>	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K.4. City of Zion Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.22.1	Zion	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	100%	1,927	3	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.22.2	Zion	Remove debris obstructing flow using American Fisheries Society guidelines.	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
1.0.3	Beach Park	Preserve and restore open and partially open green infrastructure bounded by North Ave, York House Road, Sheridan Road, and residential areas to the north (spanning SMUs #1, #3b, and #3c) for natural resource restoration and management and recreation. Preserving two corridors (19 acres) east of Sheridan Road would connect this piece to the larger Illinois Beach State Park system. The area also contains storage area #30 and potential storage area #27, which may help reduce flooding in the area of FPAI 20-02 along Coolidge Ave.	100%	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
1.0.8	Beach Park	Monitor IDOT-recorded flooding location at Sheridan and York House Road for further problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.9	Beach Park	Monitor IDOT-recorded flooding locations at Sheridan and Beach Road for further problems. 100%		NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.14	Beach Park	Install filtration and infiltration BMPs for existing commercial properties along Sheridan Road. Cost estimate reflects 10' wide swale improvements (as a proxy for lot level / source control BMPs) along 1500 lf of Sheridan Road frontage.	100%	0	0	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
1.0.15	Beach Park	Improve any swale and other surface stormwater drainage systems within the developed areas of the western part of this SMU, which is mostly unsewered, and install stormwater filtration and infiltration BMPs. Details reflect 54,000 lf (approximately 12.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of roads within this part of the SMU.	75%	57,915	61	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
1.0.23	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.24	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.27	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
2.0.5	Beach Park	Monitor past IDOT-recorded flooding at Sheridan and Wadsworth for further problems and remediate if flooding continues. 100%		NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3a.25.4	Beach Park	Remove debris obstructing flow using American Fisheries Society guidelines.	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3a.26.1	Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. A wider, partially forested buffer is appropriate in the lower parts of the reach.	100%	3,212	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3a.26.2	Beach Park	Restore stream channel and improve instream habitat by installing & enhancing pools and riffles.	25%	1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3a.26.3	Beach Park	<i>Address Moderate streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the silt and sediment load.</i>	100%	79,200	36	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.26.4	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	2,200	5,280	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3a.26.5	Beach Park	Remove chain link fence placed across stream channel.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3a.26.6	Beach Park	<i>Remediate significant erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.26.7	Beach Park	Investigate and remediate collapsed pedestrian bridge in the stream channel.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	1	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3b.0.2	Beach Park	Consider daylighting and restoring as much of the Wilson Avenue Tributary (not inventoried) as possible through the residential areas. Daylighting and restoration should address concerns about the tank cars and transite pipes that are reported to transmit the flow below ground in this location.	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.0.3	Beach Park	Buffer the Wilson Avenue Tributary from encroachment by preserving open Category 2 green infrastructure areas.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	2	NA	NA	3
3b.0.5	Beach Park	Restore and manage the wetlands within the open and partially open Category 1 Green Infrastructure areas just north of Lyons Woods Forest Preserve; reconnect these wetlands to the Lyons Woods system.	75%	1,379	3	63% BOD	90% HC; 36-69% TM	NA	1	NA	3	NA	NA	NA	1	3	NA
3b.0.8	Beach Park	FPAI site 20-04, in the Village of Beach Park, experiences sewer backup into homes due to an inadequate drainage system. Investigate whether the remedial measure, a large pipe and ditch installed as part of the Monarch Point development to the north, fixed the problem. If not, remedial action should be taken, which may include working with the open areas identified on the SMU map to relieve drainage issues.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	1

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.0.9	Beach Park	FPAI site 20-05, in the Village of Beach Park, experiences road, home, and backyard flooding due to inadequate conveyance capacity of the open ditch and culvert, particularly the culvert under Yorkhouse Road. Remedial action may include retrofit / restoration of open green infrastructure areas to help absorb / store flood water.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	1
3b.0.10	Beach Park	The area where BL13, BL14, and BL15 come together is in need of a stream restoration plan to remediate the buildup of debris, concrete lined channels, underground culverts and railroad tank cars, yard waste in the stream channel, and other impacts from nearby residential areas. 25%		NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.0.11	Beach Park	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address turbidity / sedimentation by naturalizing the basin.	100%	642	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.0.13	Beach Park	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup.	100%	402	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.0.14	Beach Park	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation.	100%	402	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.0.17	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3b.0.18	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3b.0.19	Beach Park	Plant banks with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; remove excess debris.	100%	522	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.0.20	Beach Park	Convert to wet or wetland basin; plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup.	100%	683	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.0.21	Beach Park	Plant banks and a surrounding buffer with native vegetation; remove excess debris.	100%	964	2	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.12.1	Beach Park	<i>Restore stream channel and improve instream habitat by installing and enhancing pools and riffles.</i>	25%	1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.12.2	Beach Park	<i>Address High streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the instream silt / sedimentation load.</i>	100%	492,480	205	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.12.3	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	3,051	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.12.4	Beach Park	<i>Investigate / inspect failed / broken concrete dam along west of Cheney / North Ave. for impact on stream, and remove impacting dam elements if found be have a negative impact.</i>	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3b.12.5	Beach Park	<i>Stabilize typical 1-2 foot erosion on right bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	540	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.12.6	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3b.12.7	Beach Park	<i>Stabilize significant erosion and slumping of right bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.12.8	Beach Park	<i>Remove debris and sediment from culvert under Beach Road.</i>	100%	1	NA	NA	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA
3b.12.9	Beach Park	<i>Remediate erosion of open point discharge channel draining to the creek using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.12.10	Beach Park	<i>Remediate erosion of open point discharge channel draining to the creek using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.13.1	Beach Park	<i>Manage and restore the wooded ravine along reach BL13. Assumes an area 2500 lf by 150 ft in width for cost estimating purposes.</i>	75%	1,674	4	63% BOD	90% HC; 36-69% TM	NA	3	1	3	3	2	1	1	1	1
3b.13.2	Beach Park	<i>Restore stream channel and improve instream habitat by installing and enhancing pools and riffles and removing numerous debris jams according to the American Fisheries Society guidelines.</i>	25%	1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.13.3	Beach Park	<i>Address High streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the instream silt / sedimentation load.</i>	100%	777,600	324	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.13.4	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	4,818	8	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.13.5	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	3,300	11,880	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3b.13.6	Beach Park	Inspect footbridges and armored / concrete-lined banks and remediate if found to be negatively impacting the stream.	75%	197	0	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
3b.13.7	Beach Park	<i>Restore channel reach near Wilson Avenue by installing pool and riffle structures and stabilizing streambanks.</i>	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.13.8	Beach Park	Remove concrete debris dumping / fill just upstream of Beach Rd culvert from property / operation at Tewes and Beach.	100%	NA	NA	NA	1	NA	NA	NA	NA	NA	1	1	NA	NA	1
3b.13.9	Beach Park	<i>Remediate significant erosion and slumping of right bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.13.10	Beach Park	<i>Inspect and assess fencing across channel and rock wall armoring and remove if found to impair the conveyance of water.</i>	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3b.13.11	Beach Park	<i>Remove concrete from channel and restore stream channel by stabilizing streambanks and installing habitat features such as pools and riffles and rootwads. Assumes 150 lf of stream channel needs attention for cost estimation purposes.</i>	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.13.12	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3b.13.13	Beach Park	<i>Remove debris and sediment from culvert under Beach Road.</i>	100%	1	NA	NA	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA
3b.13.14	Beach Park	<i>Address failed concrete wall armoring and major erosion behind the armoring by removing the concrete and using bioengineering stabilization measures. Assumes 100lf of stream channel needs attention for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.13.15	Beach Park	<i>Repair or replace broken concrete and corrugated metal pipe culvert and remove debris obstructing flow.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA



Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.13.16	Beach Park	<i>Stabilize erosion at and below outfall using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.13.17	Beach Park	<i>Repair failed clay outfall pipe and address erosion around outfall using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.14.1	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	803	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.14.2	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	550	330	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3b.14.3	Beach Park	<i>Conduct major channel restoration by removing debris and restoring a natural channel to this concrete-lined drainage ditch.</i>	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.15.10	Beach Park	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.11	Beach Park	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.12	Beach Park	<i>Remove debris at the outfall discharge points.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3b.17.1	Beach Park	<i>Restore stream channel and improve instream habitat by enhancing pools and riffles. 25%</i>		NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.17.2	Beach Park	<i>Address Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	95,040	43	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.17.3	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	3,854	6	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.17.4	Beach Park	<i>Inspect footbridges and armored / concrete-lined banks along this reach for impacts on the stream corridor and remediate if necessary.</i>	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>



Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / f ow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.17.5	Beach Park	Remove broken concrete slab streambank armoring and restore channel to natural channel condition. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes. 25%		NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.17.6	Beach Park	Restore a minimum 5 foot wide, deep- rooted native plant buffer to the stream edge within the golf course.	100%	964	2	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.17.7	Beach Park	Remove debris at outfall.	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3b.17.8	Beach Park	Stabilize significant erosion and bank slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.	100%	6,480	3	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.17.9	Beach Park	Remove debris blocking culvert and repair, remediate, and/or stabilize the exposed culvert.	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.17.10	Beach Park	Stabilize erosion undermining the culvert, preferably using bioengineering stabilization measures but also using more structural measures if necessary.	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.0.9	Beach Park	FPAI site 20-02, in the Village of Beach Park, experiences flooding due to inadequate outlets and poor drainage. There is a backyard drainage ditch between Beach and Howard, Sheridan and Geraghty (depressional storage #49) and extending along Coolidge Rd to the north (depressional storage #50) that are likely part of the cause of flooding. Investigate whether the new storm sewer along Coolidge Avenue has eliminated flooding in this location. If flooding persists, additional solutions may include improvement of drainage overland flow paths and installation of additional storm sewer capacity to alleviate the problem.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3c.0.10	Beach Park	Monitor past IDOT-recorded flooding locations at Sheridan and Wadsworth, Sheridan and Talmadge / Michigan, and Sheridan and Beach Rd. to determine whether flooding is still occurring at these sites. If so, develop and implement flood mitigation strategies.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3c.0.14	Beach Park	Stabilize / regrade shoreline and plant banks and a surrounding buffer with native vegetation.	100%	522	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.0.15	Beach Park	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address algae / nutrient loads and turbidity / sedimentation by naturalizing the basin.	100%	482	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3c.0.16	Beach Park	Retrofit as wet / wetland basin; stabilize / regrade shoreline and plant banks and a surrounding buffer with native vegetation.	100%	241	0	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3c.0.18	Beach Park	Plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup.	100%	301	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3c.7.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	1,980	4,277	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3c.7.4	Beach Park	Assess side slope seeps for restoration potential. Restore if possible.	75%	NA	NA	NA	NA	NA	1	NA	3	2	1	1	NA	NA	NA
3c.7.5	Beach Park	Remove massive debris jam approximately 300' downstream of Sheridan Road and stabilize channel.	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.8.1	Beach Park	<i>Address High streambank erosion along entire reach, some threatening homes and property, using bioengineering stabilization measures.</i>	100%	518,400	216	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.8.2	Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	100%	3,212	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.8.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	2,200	5,280	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3c.8.4	Beach Park	<i>Repair broken cement outfall pipe and stabilize surrounding erosion using bioengineering stabilization measures. Location is approximately 300' upstream of Sheridan Rd.</i>	100%	130	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.8.5	Beach Park	<i>Stabilize streambank erosion across from the sewer / manhole stabilization project along the reach near the Garaghty / California intersection. Length of problem is unknown; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	100%	990	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.8.6	Beach Park	<i>Stabilize minor channel erosion and downcutting of channel outfall using bioengineering stabilization measures and energy dissipation measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.8.7	Beach Park	<i>Stabilize major erosion behind headwall and below outfall preferably using bioengineering stabilization measures but may also require more structural measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.8.8	Beach Park	<i>Stabilize moderate channel erosion and downcutting using bioengineering stabilization measures and, if necessary, check dams.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.8.9	Beach Park	<i>Address major erosion and slumping on left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	100%	6,480	3	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.8.10	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.8.11	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.8.12	Beach Park	<i>Monitor sewer manhole, which rises 6 feet above stream elevation, for leakage and infiltration problems.</i>	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3c.8.13	Beach Park	<i>Stabilize major erosion and slumping of ravine bank using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.8.14	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.9.1	Beach Park	<i>Restore stream channel and improve instream habitat by installing and enhancing pools and riffles and installing boulders, large rocks, and / or rootwads.</i>	25%	1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3c.9.2	Beach Park	<i>Stabilize High streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	648,000	270	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU_reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.9.3	Beach Park	<i>Restore the native riparian buffer (manage native riparian plant communities within this reach: control invasive species, plant native species, thin shrub layer to allow more understory growth, and manage vegetation such as through prescribed burning.)</i>	100%	4,015	7	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.9.4	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	2,750	8,250	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3c.9.5	Beach Park	<i>Stabilize major erosion with slumping on the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	100%	6,480	3	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.9.6	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.9.7	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.9.8	Beach Park	<i>Remove debris around plastic outfall pipe.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.9.9	Beach Park	<i>Stabilize major erosion on the left bank using bioengineering stabilization measures.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.9.10	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.9.11	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.9.12	Beach Park	<i>Stabilize major erosion and slumping of the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.10.1	Beach Park	<i>Stabilize High streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the silt / sediment accumulation within this reach.</i>	100%	207,360	86	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.10.2	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	1,285	2	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.10.3	Beach Park	<i>Stabilize major erosion and slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.10.4	Beach Park	<i>Stabilize erosion around capped outfall pipe using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.11.1	Beach Park	<i>Stabilize High streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	648,000	270	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.11.2	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	4,015	7	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.11.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	2,750	8,250	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3c.11.4	Beach Park	Remove debris obstructing culverts.	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.11.5	Beach Park	Remove debris from outfall channel and assess armoring for impact on stream; if negative impact is found, remove armoring and stabilize with bioengineering approach. 100%		54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.11.6	Beach Park	<i>Stabilize major erosion and slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.11.7	Beach Park	<i>Repair / remediate erosion below outfall using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.11.8	Beach Park	Remove debris obstructing flow using American Fisheries Society guidelines.	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.11.9	Beach Park	<i>Stabilize major erosion occurring behind armoring on the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.11.10	Beach Park	<i>Assess wood armoring / retention wall for stability and feasibility of bioengineered approach to bank stabilization. Assumes 100lf of stream channel, both sides for cost estimation purposes.</i>	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3c.19.1	Beach Park	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	75,240	34	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.19.2	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	3,051	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.19.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	2,090	4,765	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3c.19.4	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.19.5	Beach Park	<i>Stabilize significant erosion and slumping on the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.19.6	Beach Park	<i>Stabilize channel erosion and downcutting of discharge channel using bioengineering stabilization measures and check dams or other grade stabilization measures if necessary.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.19.7	Beach Park	<i>Stabilize channel erosion and downcutting of discharge channel using bioengineering stabilization measures and check dams if necessary.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.20.1	Beach Park	<i>Restore stream channel and improve instream habitat by installing and enhancing pools and riffles.</i>	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3c.20.2	Beach Park	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	142,560	65	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / f ow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.20.3	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	5,782	10	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.20.4	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	3,960	17,107	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3c.20.5	Beach Park	<i>Stabilize significant erosion and slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.20.6	Beach Park	<i>Stabilize significan erosion and attempted stabilization debris around culvert using bioengineering stabilization measures</i>	100%	130	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.20.7	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
3c.20.8	Beach Park	<i>Stabilize channel erosion and dncutting of discharge channel using bioengineering stabilization measures and check dams if necessary.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.20.9	Beach Park	<i>Stabilize erosion around culvert using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.20.10	Beach Park	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.20.11	Beach Park	<i>Repair or remediate cracked concrete armoring at outfall.</i>	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3c.24.1	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	3,212	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.24.2	Beach Park	<i>Remove debris including tires.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
4.0.1	Beach Park	<i>Preserve and restore the ravine within the open Category 1 green infrastructure area between Ganster Road and Sheridan Road, just east of Lyons Woods Forest Preserve. 100%</i>		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Table K.5. Village of Beach Park Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
4.0.6	Beach Park	Expand / enlarge detention basins #28, #75, and #76 to reduce IDOT-recorded flooding locations along Sheridan Road north of Blanchard.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
4.0.9	Beach Park	Inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address algae / nutrients by naturalizing the basin; remove excess debris.	100%	522	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
4.05.3	Beach Park	Remove debris / bricks in channel.	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
4.05.4	Beach Park	<i>Stabilize bank erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	100%	990	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA



Table K6. City of Waukegan Plan Implementation Pollutant Load Reduction Estimates

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / f ow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
1.0.7	Waukegan	Preserve and restore the green infrastructure areas in the southwest corner of the SMU, east of the Union Pacific rails and west of industrial land uses (Midwest Generation, North Shore Sanitary District, and Outboard Marine Corporation). This area has been identified by the City of Waukegan for restoration as the 'Waukegan Moorlands'.	100%	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
1.0.10	Waukegan	Investigate the wetlands adjacent to the Johns Manville lagoons for restoration and remediation potential and as a possible water quality improvement facility for water runoff from nearby industrial sites. Cost reflects standard wetland restoration and management rather than clean up and remediation.	75%	6,895	14	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
1.1.1	Waukegan	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	3,212	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
1.1.3	Waukegan	<i>Restore stream channel and instream habitat by reducing / remediating channelization, possibly through a remeandering and other restoration projects such as installing boulders, large rocks, and / or rootwads.</i>	25%	1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
1.1.5	Waukegan	Inspect and remediate culvert, which is nearly full of water in the inventory photo and may be sediment filled.	100%	NA	NA	NA	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA
1.1.6	Waukegan	Inspect and remediate culvert, which is nearly full of water in the inventory photo and may be sediment filled.	100%	NA	NA	NA	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA
3b.0.12	Waukegan	Address algae / nutrient loads by naturalizing the basin.	100%	0	3	3	NA	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.0.15	Waukegan	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3b.0.16	Waukegan	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation.	100%	321	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3b.16.5	Waukegan	<i>Stabilize the eroding, 4 foot deep cut channel within the turf grass landscape at the upstream end of BL16, just downstream of the Beach Rd. culvert.</i>	100%	77,760	32	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.16.6	Waukegan	<i>Repair or replace the steel Beach Road culvert that is eroding around the edges and beneath, possibly due in part to the additional plastic drain pipe.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K6. City of Waukegan Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU,reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.0.3	Waukegan	For Waukegan Airport property, implement the spill prevention and response plan and reduce the use of salt and/or deicers. Install filtration and infiltration BMPs to capture and treat runoff from airport landscapes, particularly impervious surfaces such as runways and fueling areas, before being discharged to the stream system of Bull Creek.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3c.0.17	Waukegan	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation.	100%	1,044	2	30-50% BOD	62-75% HC; 14-71% TM	1	1	NA	NA	1	1	NA	NA	NA	NA
4.0.5	Waukegan	Improve swale and other surface stormwater drainage systems within the developed areas of the SMU, particularly those residential areas off Miraflores and Montesano, with lot level stormwater filtration and infiltration BMPs. Details reflect 28,000 lf (approximately 6.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.	75%	30,030	32	30-90% BOD	62-90% HC; 14-100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
4.0.7	Waukegan	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
4.0.8	Waukegan	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
4.05.5	Waukegan	<i>Stabilize and strengthen the incised discharge channel.</i>	100%	2,592	1	30-50% BOD	62-75% HC; 14-71% TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.0.1	Waukegan	Preserve the ravine within the 7-acre open Category 1 green infrastructure area between Circle Court and the Amstutz Expressway. 100%		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA
5.0.2	Waukegan	Preserve and restore wetland complexes where these resource remain, including those along the entire length of reach BL04 and those adjacent to Lake County Gardens (depressional storage areas #22 and #23). Wetland / depressional area #23, bordered by Pine, Lorraine, Wilson, and the McClory Bike Trail, contains some elements of a decent quality wetland indicative of good restoration potential. Two additional potential restoration areas are the small park between Butrick and Yeoman and the upstream drainage corridor north of and paralleling Rice St.	75%	12,804	27	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
5.0.3	Waukegan	Preserve the wetlands / stream corridor within Category 1 and 2 open green infrastructure areas between Rice and MacArthur, west of Lewis Avenue, and the area between Pine, Wilson, and the McClory bike path.	100%	NA	NA	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	NA	NA

Table K6. City of Waukegan Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
5.0.4	Waukegan	<i>Install filtration BMPs for commercial and institutional uses along Greenwood Avenue and at the York House Rd / Lewis Ave intersection to help reduce pollutant loading in potential pollution hotspot subbasins S13, S14, S43, and S73. Details reflect 10,000 lf (approximately 2.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on along the road frontage.</i>	100%	5,500	6	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
5.0.5	Waukegan	<i>Install lot level filtration and infiltration BMPs, to help reduce pollutant loading in potential pollution hotspot subbasins S13, S14, S39, S43, and S73. Details reflect 228,000 lf (approximately 52 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	100%	125,400	137	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
5.0.6	Waukegan	<i>Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation.</i>	100%	1,205	2	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
5.0.7	Waukegan	<i>Stabilize / regrade shoreline using bioengineering practices and plant banks and surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address turbidity / sedimentation by naturalizing the basin; remove excess debris.</i>	100%	723	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
5.0.8	Waukegan	<i>Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation.</i>	100%	482	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
5.0.9	Waukegan	<i>Retrofit as wet / wetland basin; stabilize / regrade shoreline using bioengineering practices and plant banks and surrounding buffer with native vegetation.</i>	100%	723	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
5.0.10	Waukegan	<i>Retrofit as wet / wetland basin; stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address algae / nutrient loads and address turbidity / sedimentation by naturalizing the basin. This may reduce pollutant loading within potential pollutant loading hotspot S39.</i>	100%	602	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
5.0.11	Waukegan	<i>Inventory detention basin and identify resolutions to any noted functional problems. This may reduce pollutant loading within potential pollutant loading hotspot S14.</i>	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>

Table K6. City of Waukegan Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
5.2.1	Waukegan	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. Restoration and management of Bowen Park and the residential areas along Miraflores is important to enhance the habitat quality of this reach.	100%	6,424	11	30-50%BOD	62-75% HC; 14-71%TM	NA	3	NA	NA	3	3	2	1	NA	2
5.2.2	Waukegan	Reduce impacts of surrounding golf course and park property such as landscape waste dumping, turf grass stream edges. Filter and infiltrate runoff from parking lots, such as those within Bowen Park, with BMPs. Details reflect installation of lot level BMPs.	100%	2,200	5,280	30-90% BOD	62-90% HC; 14-100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
5.2.3	Waukegan	Reduce impacts of residential homes along Miraflores: cease yard waste dumping, replace mown turf grass to the edge of the stream with a minimum 10 foot native vegetation buffer, infiltrate runoff discharge from roof or footing drains with rain gardens or rain barrels, and naturalize the stream channel by replacing poured concrete and rip rap with bioengineering stabilization measures.	100%	2,200	5,280	30-90% BOD	62-90% HC; 14-100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
5.2.4	Waukegan	Gully erosion occurring in the ravines of Bowen Park should be remediated through ravine woodland restoration and management along reach BL02. Assumes 4000 lf of stream reach by 500' width. Costs reflect woodland restoration; load reduction reflects Moderate erosion stabilization. 100%		911	0	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.2.5	Waukegan	Stabilize erosion around the Sheridan Road culvert and replace the broken stormsewer that is discharging to the opposite streambank.	100%	130	0	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.2.6	Waukegan	Remove debris obstructing flow using American Fisheries Society guidelines.	100%	54	0	30-50%BOD	62-75% HC; 14-71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
5.2.7	Waukegan	Remove debris obstructing flow using American Fisheries Society guidelines.	100%	54	0	30-50%BOD	62-75% HC; 14-71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA
5.2.8	Waukegan	Stabilize typical 2-4 foot bank erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.	100%	1,980	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.2.9	Waukegan	Stabilize minor erosion of open discharge channel using bioengineering stabilization measures.	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K6. City of Waukegan Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
5.2.10	Waukegan	Stabilize significant erosion below outfall using bioengineering stabilization measures. 100%		2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.2.11	Waukegan	Stabilize minor channel erosion below concrete lined channel outfall. Consider removing concrete and stabilizing channel with more habitat-appropriate measures.	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.2.12	Waukegan	Install energy dissipation measures to address the eroding plunge pool created by discharge from the elevated outfall.	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.3.1	Waukegan	<i>Restore a 5 foot wide native riparian buffer and replace turf grass lawn edges to native riparian plant communities as is feasible within the golf course.</i>	100%	4,818	8	30-50%BOD	62-75% HC; 14-71%TM	NA	3	NA	NA	3	3	2	1	NA	2
5.3.2	Waukegan	Glen Flora Country Club: replace or remediate online detention, armored dams and wiers with more habitat appropriate structures that allow fish passage.	100%	NA	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	NA	NA	NA
5.3.3	Waukegan	<i>Stabilize erosion undercutting the concrete-lined channel outfall / dam; if feasible, remove concrete and replace with bioengineered channel stabilization measure.</i>	100%	2,592	1	30-50%BOD	62-75% HC; 14-71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
5.4.1	Waukegan	Restore stream channel and improve instream habitat by reducing channelization, such as through a re-meandering project.	25%	1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
5.4.2	Waukegan	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, and managing vegetation such as through prescribed burning.	100%	11,242	19	30-50%BOD	62-75% HC; 14-71%TM	NA	3	NA	NA	3	3	2	1	NA	2
5.4.3	Waukegan	Implement the mitigation plan for FPAI site 20-06, in the City of Waukegan, Lake County Gardens subdivision. There also may be opportunities to increase the detention and/or drainage capacity of the drainage system in this area, particularly within the community park to the north. However, improvement of the wetlands to increase their storage capacity may also be an option.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	1
5.4.4	Waukegan	Restore the upper end of this reach, a fairly undefined channel that is choked with cattails, through invasive species removal and management.	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
6.0.1	Waukegan	<i>Manage and restore the wooded ravine, wetland, and depressional area #3 that lies between the Amstutz and Sheridan Road for storage. Load reduction details reflect impact of restored wetland.</i>	75%	2,758	6	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1

Table K6. City of Waukegan Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
6.0.3	Waukegan	Open and partially open Category 1 green infrastructure areas between the waste water treatment plant and the Union Pacific tracks should be restored and integrated into the planned Waukegan Moorlands area to the north. Details reflect natural area restoration.	75%	5,516	12	63% BOD	90% HC; 36-69% TM	NA	3	NA	NA	1	NA	NA	NA	NA	NA
6.0.4	Waukegan	<i>Install filtration BMPs for commercial, industrial, and institutional uses in the eastern and southwestern portions of the SMU to help improve water quality in potential pollutant loading hotspot S10, S11, and S75. Details reflect approximately 15,000 lf (approximately 3.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on along the road frontages of these land uses.</i>	100%	2	0	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
6.0.5	Waukegan	<i>This SMU is primarily sewerd but undetained. Install source controls and lot level filtration and infiltration BMPs, including detention basin improvements, which may help address pollutant loading in potential pollutant loading hotspot S10, S11, and S75. Details reflect 96,000 lf (approximately 22 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	75%	102,960	108	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA

Table K7 Illinois Department of Natural Resources Plan Implementation Pollutant Load Reduction Estimates

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / f ow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
1.0.2	IDNR	Develop and implement habitat restoration and management plans for Illinois Beach State Park, including all wetlands, waterways, beach ridge, dune and swale systems, and T&E species habitat.	75%	304,937	639	63% BOD	90% HC; 36-69% TM	NA	3	1	3	3	1	1	NA	NA	NA
1.0.5	IDNR	Restore hydrologic connectivity of Dead River to Lake Michigan and remove those created to carry wastewater to the lake. Assumes that 4 hydrologic connections need to be restored or removed.	75%	NA	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	NA	NA	NA
1.0.16	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.17	IDNR	Stabilize / regrade shoreline using bioengineering practices and address algae / nutrient loads by naturalizing the basin.	100%	883	606	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
1.0.18	IDNR	Address algae / nutrient loads by naturalizing the basin.	100%	1	3	3	NA	1	1	NA	NA	1	1	NA	NA	NA	NA
1.0.19	IDNR	Address algae / nutrient loads by naturalizing the basin.	100%	1	3	3	NA	1	1	NA	NA	1	1	NA	NA	NA	NA
1.0.20	IDNR	Address algae / nutrient loads by naturalizing the basin.	100%	1	3	3	NA	1	1	NA	NA	1	1	NA	NA	NA	NA
1.0.21	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.22	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.25	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1.0.26	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>



Table K8. Lake County Implementation Pollutant Load Reduction Estimates

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3a.0.6	Lake County	Depressional storage area #78, within the Thunderhawk Golf Club Forest Preserve, may be able to be expanded to provide additional storage if needed, and may also be retrofitted / restored to improve runoff quality from the golf course, provided that runoff can be directed into this area, treated, and then discharged to a receiving water body. Costs reflect restoration of this wet / hydric area.	75%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	NA
3a.0.18	Lake County	Stabilize / regrade shoreline using bioengineering practices; address algae / nutrient loads by naturalizing the basin.	100%	964	2	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3c.0.11	Lake County	Stabilize / regrade shoreline using bioengineering practices; address algae / nutrient loads by naturalizing the basin.	100%	803	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3c.0.12	Lake County	Stabilize / regrade shoreline using bioengineering practices.	100%	1,606	3	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3c.0.13	Lake County	Stabilize / regrade shoreline using bioengineering practices; address algae / nutrient loads by naturalizing the basin.	100%	522	1	30- 50%BOD	62-75% HC; 14- 71%TM	1	1	NA	NA	1	1	NA	NA	NA	NA
3c.23.1	Lake County	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	100%	5,782	10	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
4.0.3	Lake County	Manage and restore the natural resources, including ADID wetland #1831, in the northeastern corner of Lyons Woods Forest Preserve. The southern portion of depressional storage area #28 is within the Forest Preserve boundary and may be used to relieve past IDOT-recorded flooding at Sheridan and York House Road. ADID wetland is approximately 46 acres (4000' by 500' wide) and the total area of Lyons Woods is 264 acres.	75%	52,005	109	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1



Table K9 Multiple Jurisdictionis Plan Implementation Pollutant Load Reduction Estimates

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / f ow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
1.0.4	Waukegan, IDNR, Lake County	Remediate, cap, or otherwise contain contaminated areas, materials, waste piles, waste ponds, etc. to prevent contaminants from becoming mobilized (via air or water) and entering water resources or sensitive natural areas in Illinois Beach State Park.	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^	NA^
1.0.6	Beach Park, Waukegan	Preserve Category 1 open green infrastructure areas including a portion of depressional storage area #17 and the utility corridor that can serve as a green infrastructure connector between Illinois Beach State Park to Lyons Woods Forest Preserve.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	NA
1.0.11	Zion, Waukegan, IDNR	Manage the Lake Michigan shoreline and beaches to minimize beach erosion. Details reflect 28000 lf of shoreline at an average width of 150 feet.	75%	NA	NA	NA	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA
1.0.12	Zion, Waukegan, IDNR	Manage the Lake Michigan shoreline and beaches to minimize E. coli contamination that leads to beach closures. Details reflect 28000 lf of shoreline at an average width of 150 feet.	75%	NA	NA	NA	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA
1.0.13	Zion, Beach Park, Waukegan, IDNR	<i>Install drainage swale improvements or other lot level / source control BMPs to capture and treat runoff from commercial and industrial land uses within Critical Subbasins #15, #74, and #76, identified as potential Pollution Hot Spot Critical Areas. Cost estimate reflects the installation of swales (10' wide) or other treatment measures along perimeter of these land uses, approximately 35,000 lf of treatment area.</i>	100%	19,250	21	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
1.1.2	Waukegan, IDNR, Lake County	<i>Restore the natural connection and habitat quality of this reach to Lake Michigan by removing the lagoons through which the reach runs and disconnecting the reach from the Dead River to the north. Since these lagoons may be a component of a remediation or clean up plan, this should be considered a long term recommendation to be implemented when the contamination issues at Johns Manville have been adequately remediated. Details reflect major channel restoration.</i>	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
1.1.4	Waukegan, Lake County	Address potential hazardous / toxic runoff from industrial uses to the east through filter strips and other filtration and infiltration techniques installed between the reach and these land uses, or by containing and remediating runoff on site through other means. Cost estimate reflects the installation of 2000 lf of 20' wide infiltration and filtration BMPs.	100%	1,100	1	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
1.6.1	Beach Park, Lake County	Restore stream channel and improve instream habitat by installing pools and riffles and installing boulders, large rocks, and / or rootwads.	25%	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA

Table K9 Multiple Jurisdictional Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
1.6.2	Beach Park, Lake County	Restore native riparian buffer by controlling invasive species, planting native species, thinning forest and shrub canopy, and managing vegetation such as through prescribed burning.	100%	3,212	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
2.0.1	Zion Beach Park	Category 1 and 2 green infrastructure areas along the western boundary of Illinois Beach State Park and bordering the Union Pacific rails to the west should be preserved as components of the green infrastructure / greenway system that includes Ophir Park, Carmel Park, and Illinois Beach State Park. These areas contain significant low lying depressional storage areas (#55, #56, and #57) that could be used for water quality improvement, wetland / hydric soil complexes, and steep slopes that are unsuitable for development.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2.0.2	Zion, Beach Park	<i>Convert the depressional storage complex of #55, #56, and #57 to improve water quality for Critical Subbasin #2, identified as a potential Pollutant Loading Hotspot. Assumes runoff can be directed into this area, treated, and discharged to the Illinois Beach State Park stream and wetland system. Estimated area to be converted is 7000lf by 400ft wide.</i>	75%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	NA
2.0.4	Zion, Beach Park	<i>Reduce pollutant loading to Critical Subbasin #2, a potential pollutant loading hotspot, by improving swales and other surface stormwater drainage systems and installing stormwater filtration and infiltration BMPs to capture and treat runoff from parking lots, utilities, rooftops, storage areas, and other areas that may contribute pollutants to the stream. Cost estimate assumes 130,000 lf (approximately 30 acres) of 10 foot wide drainage swale improvements as a proxy for on-site source control BMPs.</i>	75%	139,425	146	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
3a.0.1	Zion, Beach Park	Manage and restore the wooded ravine along reaches BL25, BL26, and BL27. Average 5000' x 250' wide.	75%	5,713	12	63% BOD	90% HC; 36-69% TM	NA	3	1	3	3	2	1	1	1	1
3a.0.2	Zion, Beach Park	Preserve and restore wetlands along drainage channel upstream of the McClory Bike Path and the complex northwest of Lewis and 29th St., wetland #4 east of Lewis Avenue, and wetland #3 in Hermon Park (56 acres total). Regional storage area #77 and the associated wetlands (9 acres) could be restored and / or used to provide storage for this SMU if needed when the upstream area develops. Implementation details reflect wetland / hydric soils preservation and restoration.	75%	12,804	27	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
3a.0.4	Zion, Beach Park	Preserve and restore T&E habitat within the area bounded by Lebanon St., the McClory Bike Path, and 31st St.	75%	1,103	2	63% BOD	90% HC; 36-69% TM	NA	3	1	3	3	1	1	NA	NA	NA

Table K9 Multiple Jurisdiction Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / f ow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3a.0.5	Zion, Beach Park	<i>Improve any swale and other surface stormwater drainage systems and/ or install source controls and lot level stormwater filtration and infiltration BMPs within the developed areas of the SMU. These practices may help reduce pollutant loading in potential pollution hotspot subbasins S1, S3, S4, and S48. In order to generate cost and pollutant load reduction estimates, road swales are used as a proxy for individual site BMPs. Details reflect 252,000 lf (approximately 58 acre) of 10 foot wide drainage swale improvements on both side of all roads.</i>	100%	6,600	7	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
3a.25.1	Zion, Beach Park	<i>Address Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	79,200	36	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3a.25.2	Zion, Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. A wider, partially forested buffer is appropriate in the lower parts of the reach.	100%	3,212	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3a.25.3	Zion, Beach Park	Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.	100%	2,200	5,280	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3a.25.5	Zion, Beach Park	Inspect hydraulic structure for possible erosion problems and stabilize using bioengineering practices if needed.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3a.27st.1	Zion, Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	100%	6,424	11	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.0.1	Beach Park, Waukegan	Preserve and restore wetlands where these resource remain along drainage channel BL15, BL16, BL17, and along the daylight portions of the Wilson Avenue Tributary. Area is 10,000 lf by 300' wide.	75%	13,592	29	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
3b.0.4	Beach Park, Waukegan	<i>Preserve greenway easements on Category 1 and 2 green infrastructure areas along BL16, which may help reduce pollution loading in potential pollution hotspot S57. Cost estimate assumes easements of 2000 lf by 100 ft wide (4.5 acres).</i>	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table K9 Multiple Jurisdiction Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.0.6	Beach Park, Waukegan	<i>Depressional storage areas #32 and #43, currently undeveloped and containing current or former wetlands, could be enhanced to improve water quality of runoff from surrounding residential uses within this Critical Subbasin #57, identified as a potential pollutant loading hotspot. Depressional area #43 lies in an open Category 1 green infrastructure area that could be preserved for water quality improvement. Details reflect restoration and enhancement of both areas as wetlands.</i>	75%	2,462	5	63% BOD	90% HC; 36-69% TM	NA	1	NA	3	NA	NA	NA	1	3	NA
3b.0.7	Beach Park, Waukegan	<i>Improve swales and other surface stormwater drainage systems and install source controls and lot level BMPs, including detention basin improvements, within the developed areas of potential pollutant loadin hotspots S57, S59, and S63. Details reflect 165,000 lf (approximately acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	75%	176,963	186	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
3b.15.1	Beach Park, Waukegan	Restore stream channel and improve instream habitat by enhancing pools and riffles. 25%		NA	NA	NA	NA	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.15.2	Beach Park, Waukegan	<i>Address High streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	725,760	302	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.3	Beach Park, Waukegan	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	100%	4,497	8	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.15.4	Beach Park, Waukegan	Inspect footbridges and armored / concrete-lined banks for impacts on the stream corridor and remediated if necessary. 100%		NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3b.15.5	Beach Park, Waukegan	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	3,080	10,349	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3b.15.6	Beach Park, Waukegan	Inspect and, if necessary, repair the culvert under the McClory Bike Trail, which is partially collapsed.	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.7	Beach Park, Waukegan	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	1	1	NA	NA	NA	1	NA	NA	NA

Table K9 Multiple Jurisdictionis Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / f ow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.15.8	Beach Park, Waukegan	<i>Stabilize typical 4-6 foot bank erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100%	12,960	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.9	Beach Park, Waukegan	<i>Stabilize erosion of the Beach Road steel culvert experiencing erosion around and underneath using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.13	Beach Park, Waukegan	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.14	Beach Park, Waukegan	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.15	Beach Park, Waukegan	<i>Stabilize erosion around clay drain pipe outfall using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.16.1	Beach Park, Waukegan	<i>Restore stream channel and improve instream habitat by enhancing pools and riffles and installing boulders, large rocks, and / or rootwads.</i>	25%	1	1	1	1	NA	3	NA	NA	NA	NA	1	NA	NA	NA
3b.16.2	Beach Park, Waukegan	<i>Address Moderate streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the instream silt / sedimentation load.</i>	100%	138,600	63	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.16.3	Beach Park, Waukegan	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	5,621	9	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3b.16.4	Beach Park, Waukegan	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	100%	3,850	16,170	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	NA	NA	NA	1	1	1	NA	1
3b.15.16	Beach Park, Waukegan	<i>Stabilize erosion around two plastic drain pipe outfalls using bioengineering stabilization measures.</i>	100%	108	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.15.17	Beach Park, Waukegan	<i>Stabilize erosion around concrete drain pipe outfall using bioengineering stabilization measures.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

Table K9 Multiple Jurisdictionis Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3b.18.1	Beach Park, Waukegan	<i>Southwest of the Wadsworth Rd / Lewis Ave intersection. These areas include depressional storage area #34, which could be expanded and enhanced for stormwater storage and to capture and cleanse water runoff from airport property, which lies in Critical Subbasin #69, a potential pollutant loading hotspot.</i>	75%	1,379	3	63% BOD	90% HC; 36-69% TM	NA	NA	NA	NA	NA	NA	NA	1	3	NA
3b.18.2	Beach Park, Waukegan	Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.	100%	27,720	13	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3b.18.3	Beach Park, Waukegan	The culvert draining Waukegan Airport is covered with wire fencing, presumably for security or to prevent animal invasion. However, investigate source and necessity, and remove if fencing impedes flow. It appears that strong flows exit the Airport property in this location.	100%	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
3c.0.2	Beach Park, Zion	Manage and restore the wooded ravine along reaches BL07, BL08, BL09, BL10, BL11, BL19, BL20, BL21. Assumes 18,600 lf of stream by average 250' wide.	75%	21,078	44	63% BOD	90% HC; 36-69% TM	NA	3	1	3	3	2	1	1	1	1
3c.0.4	Beach Park, Zion	Preserve and restore wetlands along drainage channels BL21, BL22, BL23, BL24. Assumes 10,300 lf by 350' wide.	75%	16,350	34	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
3c.0.5	Beach Park, Zion	Preserve Category 1 green infrastructure area bounded by the McClory Bike Path, Clover, Wadsworth, and 34th St. that borders the stream channel to the north. Also preserve three separate areas through which the stream corridor runs: one along BL07 within the ravine, the second at the confluence of BL08, BL09, and BL19, and the third just upstream of this confluence along BL09.	75%	2,167	5	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
3c.0.6	Beach Park, Zion, Waukegan	<i>Install filtration BMPs for commercial, industrial, and institutional uses along Sheridan Road, Wadsworth, and Lewis Avenue, which will help reduce pollutant loading in potential pollution hotspot subbasin #64. Details reflect 12,000 lf of road frontage along these uses to be treated with improved, 10' swales (approximately 2.75 acres.)</i>	100%	6,600	7	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
3c.0.7	Beach Park, Zion, Waukegan	<i>Install lot level filtration and infiltration BMPs within potential pollution hotspot subbasin #64. Details reflect 208,000 lf (approximately 48 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	75%	223,080	234	30-90% BOD	62-90% HC; 14- 100% TM	1	NA	2	NA	NA	NA	NA	2	NA	NA
3c.0.8	Beach Park, IDNR	Preserve the Category 1 open green infrastructure area that contains depressional storage area #45 along the west side of the Union Pacific rails.	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Table K9 Multiple Jurisdictionis Plan Implementation Pollutant Load Reduction Estimates (continued)

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Area Improvement Target (percent)	Water Quality: TSS / sediment (lb/yr)	Water Quality: Nutrients (Phosphorous lb/yr)	Water Quality: Low dissolved oxygen	Water Quality: Aquatic life toxicity	Water Quality: Fecal coliform	Habitat Degradation: Lack of habitat characteristics	Habitat Degradation: Hydrologic disturbance / flow alterations	Habitat Degradation: Wetland loss / degradation	Habitat Degradation: Exotic & invasive species	Habitat Degradation: Loss / degradation of buffer	Habitat Degradation: Streamside alterations	Flood Flows: Runoff rate and volume	Flood Flows: Loss of storage	Flood Damage: Floodplain encroachment
Impairment Reduction Target				100%	100%	50%	25%	50%	25%	50%	90%	25%	75%	75%	75%	90%	100%
3c.7.1	Beach Park, IDNR	<i>Stabilize High streambank erosion along approximately 25% of this reach not included in the previous stabilization project, some threatening homes and property, using bioengineering stabilization measures.</i>	100%	129,600	54	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.7.2	Beach Park, IDNR	<i>Manage native riparian plant communities within this reach: control invasive species, plant native species, and manage vegetation such as through prescribed burning.</i>	100%	2,891	5	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.21.1	Beach Park, Zion	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	100%	138,600	63	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.21.2	Beach Park, Zion	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	100%	5,621	9	30- 50%BOD	62-75% HC; 14- 71%TM	NA	3	NA	NA	3	3	2	1	NA	2
3c.21.3	Beach Park, Zion	<i>Repair the discharge point / failed headwall approximately 200' upstream of the McClory Bike Path.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.21.4	Beach Park, Zion	<i>Stabilize channel erosion at outfall, and consider replacing rip rap control measure with bioengineering stabilization practices.</i>	100%	2,592	1	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.21.5	Beach Park, Zion	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
3c.21.6	Beach Park, Zion	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	100%	54	0	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA
4.0.2	Waukegan, Beach Park	Manage and restore the woodland ravine along reach BL05. Assumes 5000' by 500' area for cost estimation purposes.	75%	11,425	24	63% BOD	90% HC; 36-69% TM	NA	3	1	3	3	2	1	1	1	1
4.0.4	Waukegan, Beach Park	Preserve and restore the wetland complex within the open, Category 1 green infrastructure area along the eastern boundary of SMU 4 west of the Union Pacific rail line. This area creates a physical land connection between Lyons Woods and Illinois Beach State Park, and would also preserve regional storage area #17.	75%	7,289	15	63% BOD	90% HC; 36-69% TM	NA	1	1	3	1	2	1	1	3	1
4.05.1	Waukegan, Beach Park	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the silt / sediment accumulation.</i>	100%	118,800	54	30- 50%BOD	62-75% HC; 14- 71%TM	NA	NA	NA	NA	NA	1	2	NA	NA	NA

## appendix K - watershed pollutant loading and plan implementation pollutant loading reduction estimates

Table K.10. TSS Load Reduction Estimates (CDF 2006)

<b>Watershed Restoration Strategy Effectiveness</b>							
	TSS						
<b>Recommendation</b>	Effectiveness	Unit	Load	Reduction	Source for effectiveness	Source for Load	Notes
<b>Stream/Shoreline stabilization</b>							
<b>Severe</b>	90%	Lbs/ft/yr	144	129.6	IEPA worksheet	IEPA worksheet, 4' bank, LRR=0.4	Assumes Loam soils
<b>Moderate</b>	90%	Lbs/ft/yr	22	19.8	IEPA worksheet	IEPA worksheet, 3' bank, LRR=0.08	Assumes Loam soils
<b>Low</b>	90%	Lbs/ft/yr	6	5.4	IEPA worksheet	IEPA worksheet, 2' bank, LRR=0.03	Assumes Loam soils
<b>Protect &amp; restore wetlands/woodlands</b>	85%	Lbs/ac/yr	309	262.7	Land use change avoidance	LCSCMC unit area loads, sewerd res	Effectiveness based on comparison between open space and residential
<b>Native Buffer</b>	73%	Lbs/ft/yr	1.1	0.803	IEPA worksheet for Filter Strip	LCSCMC unit area loads, unsewerd res	Assumes 300 foot tributary area/ft of buffer
<b>Swale naturalization / source control / lot level BMPs</b>	50%	Lbs/ft/yr	1.1	0.55	Best guess	LCSCMC unit area loads, unsewerd res	Assumes 300 foot lawn and 15 foot road tributary area/ft of swale, reduction relative to turf swale; assumes 20 sf of swale area per 1 linear ft of swale
<b>Retrof t curb &amp; gutter</b>	65%	Lbs/ft/yr	2.2	1.43	IEPA, worksheet for swale	LCSCMC unit area loads, sewerd res	Assumes 300 foot lawn and 15 foot road tributary area/ft of swale, sewerd res land use



Table K.11. P Load Reduction Estimates (CDF 2007)

Watershed Restoration Strategy Effectiveness							
	P						
Recommendation	Effectiveness	Unit	Load	Reduction	Source for effectiveness	Source for Load	Notes
<b>Stream/Shoreline stabilization</b>							
Severe	90%	Lbs/ft/yr	0.06	0.054	IEPA worksheet	IEPA worksheet, 4' bank, LRR=0.4	Assumes Loam soils
Moderate	90%	Lbs/ft/yr	0.01	0.009	IEPA worksheet	IEPA worksheet, 3' bank, LRR=0.08	Assumes Loam soils
Low	90%	Lbs/ft/yr	0.002	0.0018	IEPA worksheet	IEPA worksheet, 2' bank, LRR=0.03	Assumes Loam soils
<b>Protect &amp; restore wetlands/woodlands</b>	68%	Lbs/ac/yr	0.81	0.5508	Land use change avoidance	LCSMC unit area loads, sewerer res	Effectiveness based on comparison between open space and residential loading rates
<b>Native Buffer</b>	45%	Lbs/ft/yr	0.003	0.00135	IEPA worksheet for Filter Strip	LCSMC unit area loads, unsewered res	Assumes 300 foot tributary area/ft of buffer
<b>Swale naturalization / source control / lot level BMPs</b>	20%	Lbs/ft/yr	0.003	0.0006	Best guess - assumes TP removal effectiveness is 40% of TSS removal effectiveness	LCSMC unit area loads, unsewered res	Assumes 300 foot lawn and 15 foot road tributary area/ft of swale, reduction relative to turf swale; assumes 20 sf of swale area per 1 linear ft of swale
<b>Retrofit curb &amp; gutter</b>	25%	Lbs/ft/yr	0.006	0.0015	IEPA, worksheet for swale	LCSMC unit area loads, sewerer res	Assumes 300 foot lawn and 15 foot road tributary area/ft of swale, sewerer res land use

## appendix K - watershed pollutant loading and plan implementation pollutant loading reduction estimates

Table K.12. Effectiveness of BMPs Recommended for Fish Lake Drain (NIPC)

	BMP Objective						
BEST MANAGEMENT PRACTICE	Runoff	Runoff Volume Control	Physical Habitat Preservation	Sediment Pollution Control	Nutrient Control	BOD	Other
	Rate Control						Pollutant Control*
	Control						
Impervious Area Reduction	2	2	2	2	2	2	2
Impervious Area Disconnection	2	2	1	2	2	2	2
Filter Strips	2	2	2	2	2	2	2
Swales		2	1	2	2	2	2
Infiltration	2	3	1	3	3	3	3
Devices							
Porous	2	2	1	3	3	3	3
Pavement							
Wet Detention	3	1	2	3	2	3	2
Wetland	3	1	2	3	2	3	2
Detention							
Dry Detention	2	1	1	2	1	1	1
Settling Basins	2	1	1	2	2	2	2
Water Quality Inlets	1	1	1	2	1	1	1
Sand Filters	1	1	1	3	2	2	2
Rock Outlet	1	1	2	2	1	1	1
Protection							
Storage Area Cover	1	1	1	2	2	1	2-3
Street	1	1	1	1-2	1	1-2	1-2
Sweeping							
Source Controls	1	1	1	1	2	2	2
Stream Protection/ Restoration	2	1	3	2	2	2	1
Wetland Protection/ Restoration	2-3	2-3	3	2-3	2	2-3	2
<b>Key</b>							
3 = Fully achieves objective; 2 = partially achieves objective; 1 = minimally achieves objective							
* Other pollutants include toxic compounds such as heavy metals and pesticides, fecal bacteria, petroleum based hydrocarbons, and deicing materials such as salt. A "2" in this column indicates that the BMP controls some of these pollutants but not others.							
Source: Price and Dreher, "Model Best Management Practice Selection Methodology and Lake County Decision Making Framework", Northeastern Illinois Planning Commission, July 1994.							

Table K.13. BMP Effectiveness (CDF Flint Creek)

	BMP Objective (Removal / Reduction in Percent)				
	Annual TSS Removal	Annual TP Removal	Annual BOD Removal	2-Yr Rate Reduction	Annual Runoff Volume Reduction
<b>BMP</b>					
Impervious Area Reduction	14% for I1&I2=25&20	9% for I1&I2=25&20	14% for I1&I2=25&20	18% for I1&I2=25&20	13% for I1&I2=25&20
Impervious Area Disconnection	See Filter Strips and Swales	See Filter Strips and Swales	See Filter Strips and Swales	See Filter Strips and Swales	See Filter Strips and Swales
Filter Strips (a)	90% for R=0.5 72% for R=5	64% for R=0.5 37% for R=5	64% for R=0.5 37% for R=5	negligible	40% for R=0.5 18% for R=5
Swales	70%	30%	30%	10%	15%
Infiltration Devices	94% for P=1.0"	83% for P=1.0"	83% for P=1.0"	2% for P=1.5"; 35% for P=2.0"; 100% for P=3.0	76% for P=1.0"
Wet Detention (b)	92%	72%	72%	90-98% for I>20%	Negligible
Wetland Detention (b)	90%	63%	63%	90-98% for I>20%	Negligible
Dry Detention (b,c)	70% for I=10	27% for I=10	27% for I=10	90-98% for I>20%	Negligible
Settling Basins (d)	88% for I=25; 75% for I-75	62% for I=25; 41% for I-75	69% for I=25; 43% for I-75	51% for I=25; 0% for I-80	Negligible
Sand Filters (e)	75-90%	30-45%	30-50%	0	0
Water Quality Inlets	39%	13%	13%	0	0
Weekly Street Sweeping	16%	6%	6%	0	0
Key:			(a) R is ration of impervious area to filter strip area		
I=percent Imperviousness = 100/(1+1/R)			(b) Removal rates for Lake County detention design		
R=Ration of treated impervious area to pervious area = 1/(100/I-1)			© Dry detention may not be feasible for high impervious %		
P=design Precipitation event (inches)			(d) Removal rates for Lake County divert and detain requirement		
			(e) Austin Texas reported removal rates		

## appendix K - watershed pollutant loading and plan implementation pollutant loading reduction estimates

Table K.14. Pollutant Removal Efficiencies for Selected Groups of BMPs (Center for Watershed Protection)

Median Stormwater Pollutant Removal Rate (Percent)							
Best Management	No. of	Total Suspended Solids	Total Soluble	P <sup>3</sup>	Total N <sup>4</sup>	Nitrate Carbon	<sup>5</sup>
Practice Studies	<sup>1</sup>		P <sup>2</sup>				
Detention pond	2	7	10	2	5	3	(-1)
Dry ED* pond	6	61	19	(-9)	31	9	25
Wet pond	30	77	47	51	30	24	45
Wet ED* pond	6	60	58	58	35	42	27
Ponds <sup>A</sup>	36	67	48	52	31	24	41
Shallow marsh	14	84	38	37	24	78	21
ED* wetland	5	63	24	32	36	29	ND
Pond/wetland 1	1	72	54	39	13	15	4
Wetlands 35		78	51	39	21	67	28
Surface sand filters	6	83	60	(-37)	32	(-9)	67
Filters <sup>B</sup>	11	87	51	(-31) 44		(-13) 66	
Channels 9		0	(-14)	(-15)	0	2	18
Swales <sup>C</sup>	9	81	29	34	ND 38		67
* ED = extended detention <sup>1</sup> Number of performance monitoring studies <sup>2</sup> Total P = total phosphorus <sup>3</sup> Soluble phosphorus as measured as ortho-P, soluble reactive phosphorus or biologically available phosphorus <sup>4</sup> Total N = total nitrogen <sup>5</sup> Carbon = measure of							
Source: Center for Watershed Protection							

Table K.15. Pollutant Removal Efficiencies for BMPs (Center for Watershed Protection)

Median Stormwater Pollutant Removal Rate (Percent)						
Best Management Practice	Bacteria <sup>E</sup>	Hydro-	Cadmium	Copper	Lead	Zinc
		Carbons <sup>F</sup>				
Detention and Dry ED* Ponds	ND	ND	54	26	43	26
Ponds <sup>A</sup>	65	83	24	57	73	51
Wetlands <sup>77</sup>		90	69	39	63	54
Filters <sup>B</sup>	55	81	— <sup>34</sup>		71	80
Channels <sup>0</sup>		ND	55	14	30	29
Swales <sup>C</sup>	(-50) <sup>62</sup>		42	51	67	71
* ED = extended detention. <sup>A</sup> Excludes conventional and dry ED ponds. <sup>B</sup> Excludes vertical sand filters and vegetated filter strips. <sup>C</sup> Includes bio filters, wet swales and dry swales. <sup>D</sup> The number of studies is less than 5 for some BMP groups for bacteria, T						

Table K.16. Pollutant Removal Efficiencies for BMPs (IEPA)

	Pollutant Removal Rate (Percent)				
Best Management Practice	BOD	COD	TSS	Lead	Copper
Vegetated Filter Strips	50	40	73	45	
Grass Swales	30	25	65	70	50
Infiltration Devices	83		94		
Extended Wet Detention	72		86	40	
Wetland Detention	63	50	77	65	
Dry Detention	27	20	57	50	
Settling Basin	56		81		
Sand Filters	40		82		
WQ Inlets	13	5	37	15	
Weekly Street Sweeping	6		16		
Infiltration Basin		65	75	65	
Infiltration Trench		65	75	65	
Porous Pavement		80	90	1	
Concrete Grid Pavement		90	90	90	

## appendix K - watershed pollutant loading and plan implementation pollutant loading reduction estimates

Table K.17. Pollutant Removal Efficiencies for BMPs (IEPA) (continued)

	Pollutant Removal Rate (Percent)				
Best Management Practice	BOD	COD	TSS	Lead	Copper
Sand Filter/Infiltration Basin		55	80	60	
WQ Inlet w/ Sand Filter		55	80	80	
Oil/Grit Separator		5	15	15	
Wet Pond		40	60	75	
<i>Source: IEPA Nonpoint Source Unit, Pollutant Load Reduction Spreadsheets</i>					

Table K.18. Sediment

Pollutant	Potential Removal Rate*
Sediment	75%
Total nitrogen	40%
Total phosphorus	50%
Trace metals	60–70%
Hydrocarbons	75%
*Riparian buffer potential removal rate based on combined 25-foot grass strip in outer zone and 75 foot forested buffer in middle and streamside zone.	
<i>Source: Schueler, T.R. Comparative Pollutant Removal Capability of Urban BMPs: a Reanalysis. Watershed Protection Techniques Technical Note 95: 2(4), 1995.</i>	

