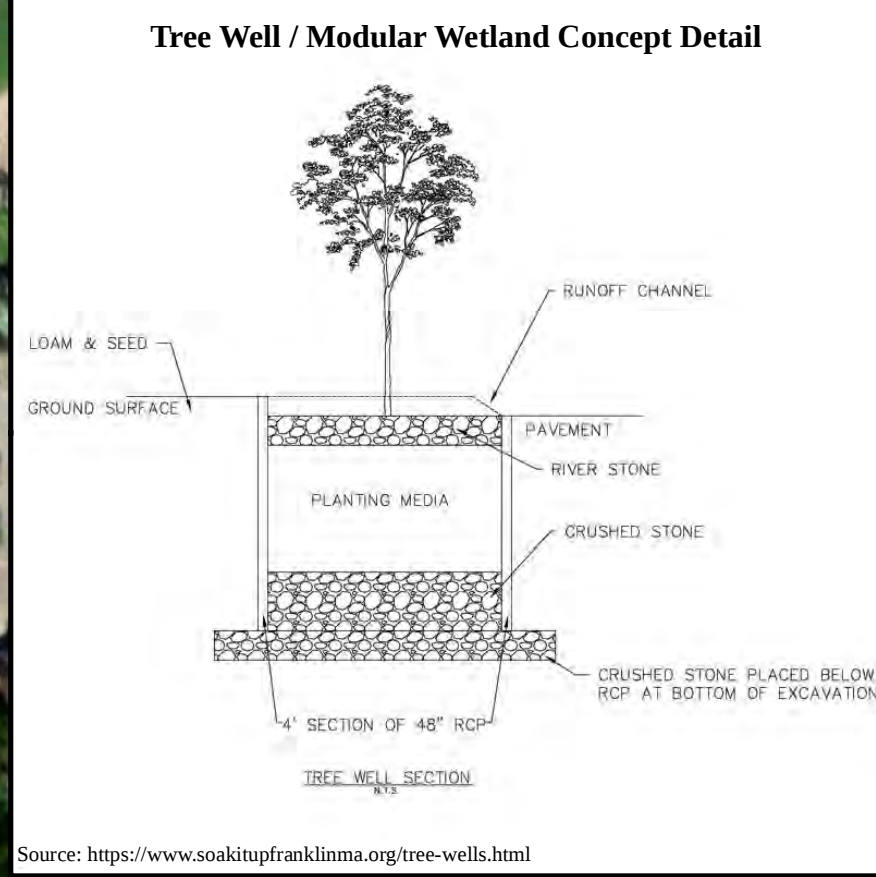
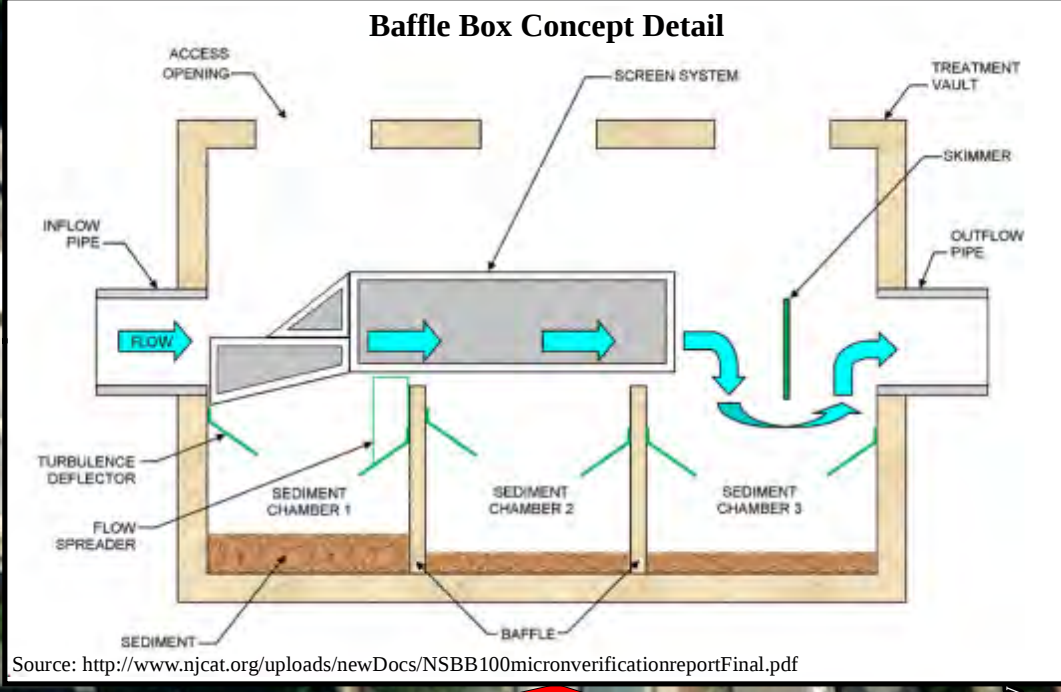
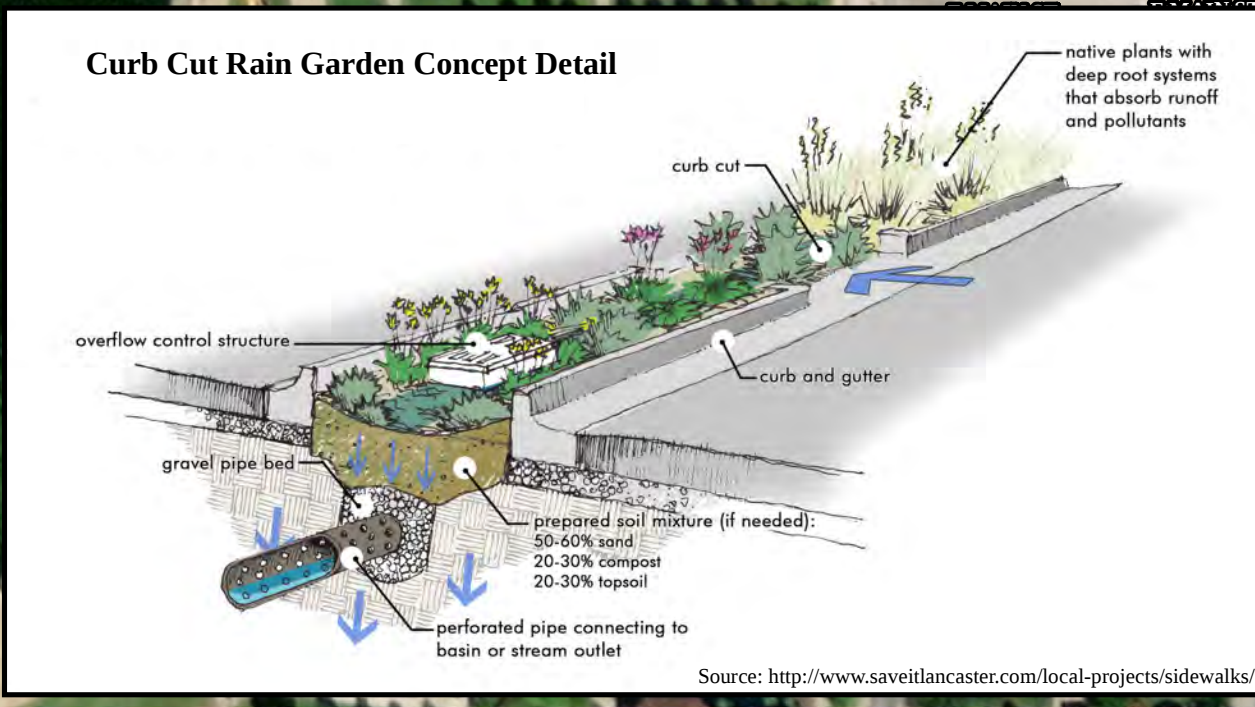
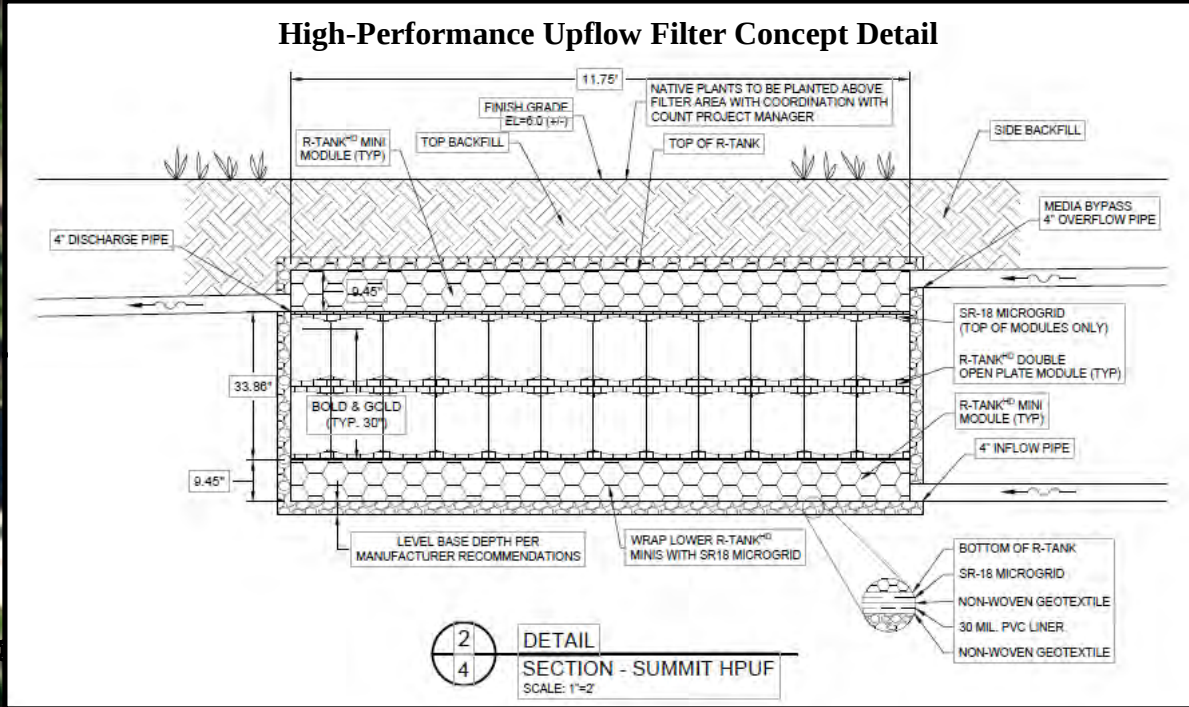
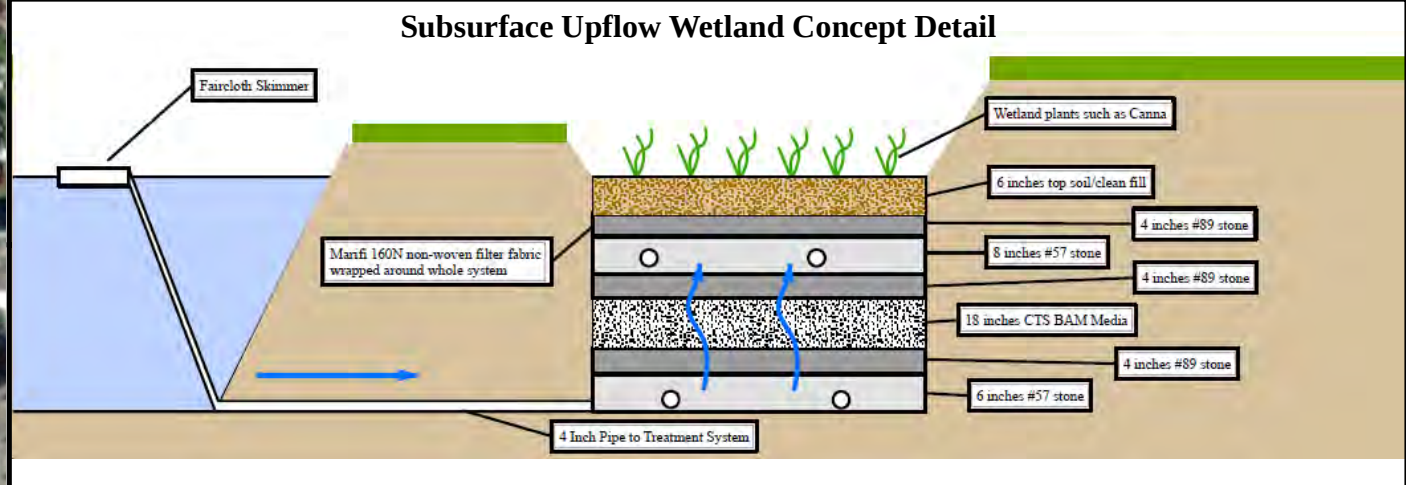
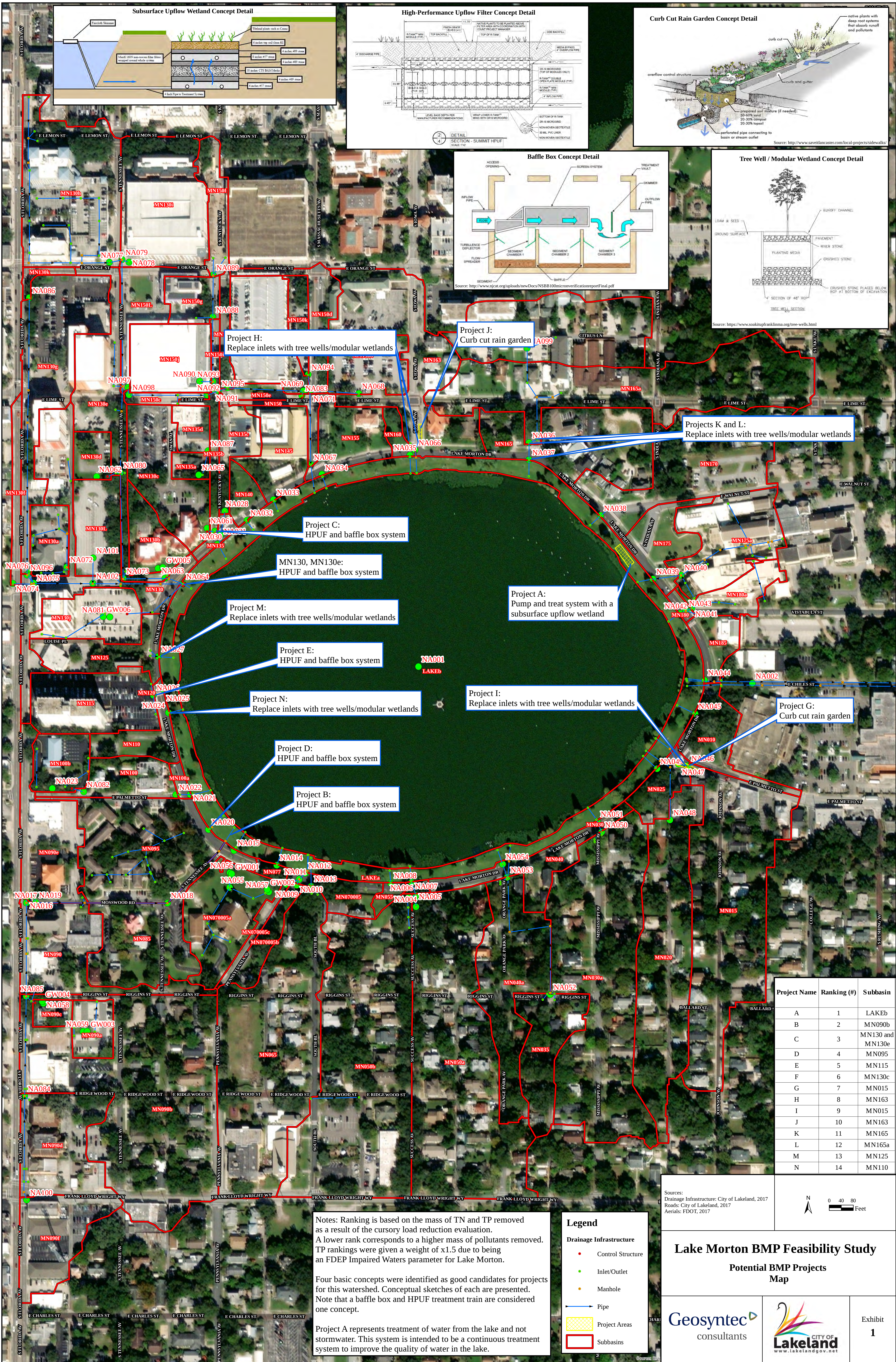




Project Name	Ranking (#)	Subbasin
A	1	LAKEb
B	2	MN090b
C	3	MN130 and MN130e
D	4	MN095
E	5	MN115
F	6	MN130c
G	7	MN015
H	8	MN163
I	9	MN015
J	10	MN163
K	11	MN165
L	12	MN165a
M	13	MN125
N	14	MN110

Notes: Ranking is based on the mass of TN and TP removed as a result of the cursory load reduction evaluation. A lower rank corresponds to a higher mass of pollutants removed. TP rankings were given a weight of x1.5 due to being an FDEP Impaired Waters parameter for Lake Morton.

Four basic concepts were identified as good candidates for projects for this watershed. Conceptual sketches of each are presented. Note that a baffle box and HPUF treatment train are considered one concept.

Project A represents treatment of water from the lake and not stormwater. This system is intended to be a continuous treatment system to improve the quality of water in the lake.

Legend

- Drainage Infrastructure
 - Control Structure
 - Inlet/Outlet
 - Manhole
 - Pipe
 - Project Areas
 - Subbasins

Sources:
Drainage Infrastructure: City of Lakeland, 2017
Roads: City of Lakeland, 2017
Aerials: FDOT, 2017

Lake Morton BMP Feasibility Study

Potential BMP Projects Map

Geosyntec consultants

Lakeland
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Exhibit 1

Project Name	Project Rank based on Mass of Pollutants Removed	Potential Water Quality Improvement Projects	BMP Description	Subbasin	Subbasin Pollutant Loading Rank out of 82	New or Retrofit	Property Ownership	Additional Notes	TN		TP	
									Mass Pollutants Removed (lb/yr)	Percent Removal	Mass Pollutants Removed (lb/yr)	Percent Removal
A	1	Subsurface Upflow Treatment Wetlands	A solar powered pump will be used to pump water out of the lake and into a subsurface upflow wetland for treatment. After treatment, the water will be returned to the lake.	LAKEb	N/A	New	City of Lakeland	This proposed project pumps lake water into a treatment area along the shore, and sends it back into the lake. This treatment is targeted at the lake itself and not at incoming stormwater. The anticipated effective life of this subsurface upflow wetland filter is 2253 years based on the phosphorus loading and mass of media provided by the BMP. Therefore, media replacement is not necessary.	268.48	60.00	11.19	45.00
B	2	HPUF and baffle box system	An offline filter with baffle box is proposed to be installed at the site in order to provide treatment prior to discharge to Lake Morton.	MN090b	12	Retrofit	City of Lakeland/Road Right-of-Way	An HPUF and baffle box system would be installed at node NA085. The baffle box is intended to remove solids while the upflow filter is intended to remove dissolved pollutants. Additionally, the baffle box would protect the filter from clogging.	31.57	49.84	5.98	49.91
C	3	HPUF and baffle box system	An offline filter with baffle box is proposed to be installed at the site in order to provide treatment prior to discharge to Lake Morton.	MN130 and MN130e	4 and 13	Retrofit	City of Lakeland/Road Right-of-Way	An HPUF and baffle box system would be installed at node NA064. The baffle box is intended to remove solids while the upflow filter is intended to remove dissolved pollutants. Additionally, the baffle box would protect the filter from clogging.	29.00	48.31	4.16	48.21
D	4	HPUF and baffle box system	An offline filter with baffle box is proposed to be installed at the site in order to provide treatment prior to discharge to Lake Morton.	MN095	7	Retrofit	City of Lakeland/Road Right-of-Way	An HPUF and baffle box system would be installed at NA020. The baffle box is intended to remove solids while the upflow filter is intended to remove dissolved pollutants. Additionally, the baffle box would protect the filter from clogging.	13.95	57.85	2.97	57.94
E	5	HPUF and baffle box system	An offline filter with baffle box is proposed to be installed at the site in order to provide treatment prior to discharge to Lake Morton.	MN115	3	Retrofit	City of Lakeland/Road Right-of-Way	An HPUF and baffle box system would be installed at node NA026. The baffle box is intended to remove solids while the upflow filter is intended to remove dissolved pollutants. Additionally, the baffle box would protect the filter from clogging.	14.26	53.42	2.05	53.45
F	6	HPUF and baffle box system	An offline filter with baffle box is proposed to be installed at the site in order to provide treatment prior to discharge to Lake Morton.	MN130c	10	Retrofit	City of Lakeland/Road Right-of-Way	An HPUF and baffle box system would be installed at node NA061. The baffle box is intended to remove solids while the upflow filter is intended to remove dissolved pollutants. Additionally, the baffle box would protect the filter from clogging.	13.62	53.32	1.96	53.29
G	7	Rain garden with curb cuts	Curb cuts will be added to allow water into the vegetated area between the sidewalk and street. Florida native vegetation will be planted in order to increase provided treatment.	MN015	19	New	Private	The curb at E Palmetto St and Johnson Ave would be cut between to allow stormwater to enter the vegetated area between the street and sidewalk. A rain garden would be created in the grass strip and allow runoff to flow in. If the water table is high, it may be necessary to add an underdrain BAM layer.	5.43	12.76	1.08	12.63
H	8	Replace inlets with modular wetlands and/or tree wells	The existing inlet(s) are to be replaced with modular wetland / tree well units that use specific filtration media and vegetation to remove pollutants from stormwater prior to entering the drainage system.	MN163	2	Retrofit	City of Lakeland/Road Right-of-Way	The inlets upstream to node NA066 would be replaced with a modular wetland/tree well system.	1.06	1.65	0.15	1.67
I	9	Replace inlets with modular wetlands and/or tree wells	The existing inlet(s) are to be replaced with modular wetland / tree well units that use specific filtration media and vegetation to remove pollutants from stormwater prior to entering the drainage system.	MN015	19	Retrofit	City of Lakeland/Road Right-of-Way	The inlet at node NA046 would be replaced with a modular wetland/tree well system.	0.88	2.07	0.18	2.06
J	10	Rain garden with curb cuts	Curb cuts will be added to allow water into the vegetated area between the sidewalk and street. Florida native vegetation will be planted in order to increase provided treatment.	MN163	2	New	Private	The curb on S Lowa Ave south of the E Lime St intersection would be cut to allow stormwater to enter the vegetated area between the street and sidewalk. A rain garden would be created in the grass strip and allow runoff to flow in. If the water table is high, it may be necessary to add an underdrain BAM layer.	2.99	4.66	0.64	6.92
K	11	Replace inlets with modular wetlands and/or tree wells	The existing inlet(s) are to be replaced with modular wetland / tree well units that use specific filtration media and vegetation to remove pollutants from stormwater prior to entering the drainage system.	MN165	1	Retrofit	City of Lakeland/Road Right-of-Way	The three inlets at nodes NA036 and NA037 would be replaced with a modular wetland/tree well system. The inlets, which are currently undersized, would be properly re-sized.	0.46	1.50	0.07	1.49
L	12	Replace inlets with modular wetlands and/or tree wells	The existing inlet(s) are to be replaced with modular wetland / tree well units that use specific filtration media and vegetation to remove pollutants from stormwater prior to entering the drainage system.	MN165a	29	Retrofit	City of Lakeland/Road Right-of-Way	The three inlets at nodes NA036 and NA037 would be replaced with a modular wetland/tree well system. The inlets, which are currently undersized, would be properly re-sized.	0.44	1.05	0.07	1.06
M	13	Replace inlets with modular wetlands and/or tree wells	The existing inlet(s) are to be replaced with modular wetland / tree well units that use specific filtration media and vegetation to remove pollutants from stormwater prior to entering the drainage system.	MN125	6	Retrofit	City of Lakeland/Road Right-of-Way	The inlets at node NA027 would be replaced with a modular wetland/tree well system.	0.46	2.84	0.07	2.83
N	14	Replace inlets with modular wetlands and/or tree wells,	The existing inlet(s) are to be replaced with modular wetland / tree well units that use specific filtration media and vegetation to remove pollutants from stormwater prior to entering the drainage system.	MN110	11	Retrofit	City of Lakeland/Road Right-of-Way	The inlet at node NA024 would be replaced with a modular wetland/tree well system.	0.46	5.28	0.07	5.26