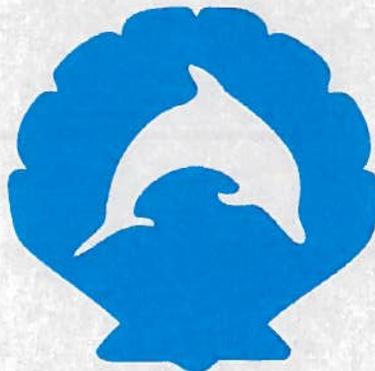


Sarasota Bay Estuary Program Outfall Prioritization Project

Prepared For:
Sarasota Bay Estuary Program



**SARASOTA BAY
ESTUARY PROGRAM**
Restoring Our Bays

Prepared by:



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1.0 INTRODUCTION

Non-point source discharges from stormwater outfalls represent a significant source of pollutant load to Sarasota Bay. Most of these outfalls are direct discharges of untreated stormwater from development which occurred before the implementation of current stormwater treatment requirements. The objectives of this project are to identify all major stormwater outfalls in the Sarasota Bay watershed, prioritize the outfalls in terms of importance to the bay and to develop practical retrofit alternatives for the top 25 ranked outfalls.

The first step in the evaluation process involves developing a tributary score for each of the 22 major tributary drainage sub-basins which outfall to the bay. The score is based on total pollutant loads, areal pollutant loads, adjacent bay submerged aquatic vegetation trends, adjacent bay secchi disk trend and total maximum daily load (TMDL) verified impairment status. The second step involves developing a score for all major outfalls in the Sarasota Bay watershed based on the tributary score, the size of the outfall and the flow path distance from the outfall to the bay proper. The third step involves developing conceptual stormwater retrofit plans for each of the 25 outfalls with the highest total score.

This report includes a summary of the outfall evaluation process including prioritization and conceptual retrofit design. Section 1 includes a summary of the tributary scoring process and results. Section 2 provides a summary of the outfall prioritization process and results and Section 3 includes conceptual designs for retrofitting the top 25 ranked outfalls.

This evaluation could not have been completed without the tributary and outfall information provided by Sarasota Bay Estuary Program (SBEP), Sarasota County, Manatee County, Jones Edmunds and Associates (JEA), Longboat Key and Holmes Beach.

2.0 TRIBUTARY MAJOR BASIN SCORING

In December 2005, JEA published a report titled "Sarasota Bay Pollutant Loading Model" for the SBEP. This report included calculated total and areal pollutant loadings for 16 parameters including nutrients, metals, demand parameters, oil and grease and fecal coliform based on a spreadsheet hydrologic and pollutant loading model. For the outfall prioritization project, 6 of the 16 parameters including annual total nitrogen (TN) load, areal TN load, annual total lead (TPb) load, areal TPb load, annual fecal coliform (FC) load and areal FC load were selected to develop pollutant loading scores for 22 major drainage tributaries. A summary of the pollutant loading values and associated basin scores are provided in Tables 2-1, 2-2 and 2-3 for TN, TPb and FC. In each case, a score of 100 is given to the basin with the largest pollutant load and the other basins are assigned a score less than 100 based on a ratio of that basin load to the largest basin load.

**Table 2-1
SBEP Outfall Prioritization Study Tributary Scoring Matrix**

Major Basin	Total N Loadings				Areal N Loading			
	(lb/yr)	Rank	%	Score	(lb/ac/yr)	Rank	%	Score
Phillippi Creek	696,424	1	48.5	100	19.8	3	7.9	83
Sarasota Bay Coastal	103,007	2	7.2	15	15.6	5	6.2	65
Little Sarasota Bay Coastal	87,334	3	6.1	13	24	1	9.6	100
Sarasota Bay	71,863	4	5	10	8	15	3.2	33
Whitaker Bayou	70,281	5	4.9	10	15.5	6	6.2	65
Curry Creek	63,695	6	4.4	9	10	11	4	42
South Creek	55,179	7	3.8	8	4.4	20	1.8	18
Bowlees Creek	53,335	8	3.7	8	9.4	14	3.8	39
Cedar Hammock	49,916	9	3.5	7	10.2	10	4.1	43
Catfish Creek	43,454	10	3	6	10.9	9	4.4	45
Matheny Creek	32,541	11	2.3	5	18.9	4	7.6	79
Hudson Bayou	31,857	12	2.2	5	13.3	7	5.3	55
Longboat Key	16,375	13	1.1	2	9.6	13	3.8	40
North Creek	16,316	14	1.1	2	7	18	2.8	29
Anna Maria Isl.	14,630	15	1	2	7.9	16	3.2	33
Palma Sola Drain	12,128	16	0.8	2	5.8	19	2.3	24
Elligraw Bayou	5,245	17	0.4	1	11.1	8	4.4	46
Holiday Bayou	4,618	18	0.3	1	23	2	9.2	96
Whitaker Bayou (Man)	4,427	19	0.3	1	7.8	17	3.1	33
Clower Creek	2,745	20	0.2	0	9.8	12	3.9	41
Phillippi Creek (Man)	1,377	21	0.1	0	4	21	1.6	17
Pearce Drain	290	22	0	0	3.7	22	1.5	15

**Table 2-2
SBEP Outfall Prioritization Study Tributary Scoring Matrix**

Major Basin	Total Pb Loading				Areal Pb Loading			
	(lb/yr)	Rank	%	Score	(lb/ac/yr)	Rank	%	Score
Phillippi Creek	7,644	1	31.6	100	0.22	10	3.9	32
Sarasota Bay Coastal	2,042	3	8.4	27	0.31	7	5.5	46
Little Sarasota Bay Coastal	677	9	2.8	9	0.19	12	3.4	28
Sarasota Bay	1,353	7	5.6	18	0.15	17	2.7	22
Whitaker Bayou	1,841	5	7.6	24	0.41	4	7.3	60
Curry Creek	681	8	2.8	9	0.11	20	1.9	16
South Creek	548	12	2.3	7	0.04	22	0.7	6
Bowlees Creek	2,653	2	11	35	0.47	3	8.3	69
Cedar Hammock	1,961	4	8.1	26	0.4	5	7.1	59
Catfish Creek	590	11	2.4	8	0.15	15	2.7	22
Matheny Creek	444	14	1.8	6	0.26	9	4.6	38
Hudson Bayou	1,632	6	6.7	21	0.68	1	12	100
Longboat Key	630	10	2.6	8	0.37	6	6.5	54
North Creek	96	17	0.4	1	0.04	21	0.7	6
Anna Maria Isl.	494	13	2	6	0.27	8	4.8	40
Palma Sola Drain	375	15	1.5	5	0.18	13	3.2	26
Elligraw Bayou	55	18	0.2	1	0.12	19	2.1	18
Holiday Bayou	29	21	0.1	0	0.15	16	2.7	22
Whitaker Bayou (Man)	351	16	1.4	5	0.62	2	11	91
Clower Creek	49	19	0.2	1	0.17	14	3	25
Phillippi Creek (Man)	47	20	0.2	1	0.14	18	2.5	21
Pearce Drain	16	22	0.1	0	0.2	11	3.5	29

**Table 2-3
SBEP Outfall Prioritization Study Tributary Scoring Matrix**

Major Basin	Total Fecal Col. Loading				Areal Fecal Col. Loading					
	(bill.col./yr)	Rank	%	Score	(bill.col./ac/yr)	Rank	%	Score	%	Score
Phillippi Creek	11,591,348	1	43.2	100	330	6	6.2	57	6.2	57
Sarasota Bay Coastal	2,155,587	2	8	19	327	7	6.1	57	6.1	57
Little Sarasota Bay Coastal	1,079,956	7	4	9	297	9	5.6	51	5.6	51
Sarasota Bay	1,260,717	6	4.7	11	141	16	2.6	24	2.6	24
Whitaker Bayou	1,862,644	4	6.9	16	411	3	7.7	71	7.7	71
Curry Creek	756,382	9	2.8	7	119	18	2.2	21	2.2	21
South Creek	494,872	12	1.8	4	39	22	0.7	7	0.7	7
Bowlees Creek	2,147,859	3	8	19	377	4	7.1	65	7.1	65
Cedar Hammock	1,496,556	5	5.6	13	304	8	5.7	53	5.7	53
Catfish Creek	639,424	10	2.4	6	161	14	3	28	3	28
Matheny Creek	579,971	11	2.2	5	336	5	6.3	58	6.3	58
Hudson Bayou	1,011,295	8	3.8	9	423	2	7.9	73	7.9	73
Longboat Key	421,119	13	1.6	4	247	11	4.6	43	4.6	43
North Creek	164,171	17	0.6	1	71	21	1.3	12	1.3	12
Anna Maria Isl.	396,215	14	1.5	3	214	12	4	37	4	37
Palma Sola Drain	241,647	16	0.9	2	116	19	2.2	20	2.2	20
Elligraw Bayou	69,507	18	0.3	1	147	15	2.8	25	2.8	25
Holiday Bayou	51,147	19	0.2	0	255	10	4.8	44	4.8	44
Whitaker Bayou (Man)	329,055	15	1.2	3	578	1	10.8	100	10.8	100
Clower Creek	36,417	21	0.1	0	130	17	2.4	22	2.4	22
Phillippi Creek (Man)	38,333	20	0.1	0	112	20	2.1	19	2.1	19
Pearce Drain	15,407	22	0.1	0	199	13	3.7	34	3.7	34

Each of the major tributaries discharge into a segment of Sarasota Bay. Dave Tomasko provided information on the % increase of submerged aquatic vegetation (SAV) in each adjacent receiving water bay segment as provided in Table 2-4. A score of 100 is given to a bay area in the bottom 20%, a score of 40 or 50 is given to a bay area in the middle and a score of 0 is given to a bay area in the top 20% in terms of % increase in SAV.

**Table 2-4
SBEP Outfall Prioritization Study Tributary Scoring Matrix**

Major Basin	Adjacent Bay SAV Trend			
	% Increase	Category	Rank	Score
Phillippi Creek	11	Middle	2	50
Sarasota Bay Coastal	13	Middle	2	50
Little Sarasota Bay Coastal	43	Top 20%	4	0
Sarasota Bay	0	Bottom 20%	1	100
Whitaker Bayou	13	Middle	2	50
Curry Creek	Outside	NA	4	NA
South Creek	43	Top 20%	4	0
Bowlees Creek	13	Middle	2	50
Cedar Hammock	0	Bottom 20%	1	100
Catfish Creek	43	Top 20%	4	0
Matheny Creek	43	Top 20%	4	0
Hudson Bayou	13	Middle	2	50
Longboat Key	13	Middle	2	50
North Creek	43	Top 20%	4	0
Anna Maria Isl.	0	Bottom 20%	1	100
Palma Sola Drain	0	Bottom 20%	1	100
Elligraw Bayou	43	Top 20%	4	0
Holiday Bayou	43	Top 20%	4	0
Whitaker Bayou (Man)	13	Middle	3	40
Clower Creek	43	Top 20%	4	0
Phillippi Creek (Man)	11	Middle	3	40
Pearce Drain	Outside	NA	4	NA

In addition, Dave Tomasko determined the trend in terms of adjacent bay Secchi disk transparency for each of the major tributary basins as provided in Table 2-5. A score of 100 is given to a bay area with a small improvement and a score of 50 is given to a receiving bay area with more improvement in terms of Secchi disk transparency. Lastly, a major tributary basin with an impairment on the verified list is given a score of 100 and a major tributary basin with an impairment on the planning list is given a score of 25 as shown in Table 2-6.

**Table 2-5
SBEP Outfall Prioritization Study Tributary Scoring Matrix**

Major Basin	Adjacent Bay Secchi Trend		
	Improve, Degrade, or No trend	Rank	Score
Phillippi Creek	Small Improve	1	100
Sarasota Bay Coastal	Improve	2	50
Little Sarasota Bay Coastal	Small Improve	2	50
Sarasota Bay	Improve	2	50
Whitaker Bayou	Improve	2	50
Curry Creek	Outside	3	NA
South Creek	Small Improve	1	100
Bowlees Creek	Improve	2	50
Cedar Hammock	Small Improve	1	100
Catfish Creek	Small Improve	1	100
Matheny Creek	Small Improve	1	100
Hudson Bayou	Improve	2	50
Longboat Key	Improve	2	50
North Creek	Small Improve	1	100
Anna Maria Isl.	Improve	2	50
Palma Sola Drain	Improve	2	50
Elligraw Bayou	Small Improve	1	100
Holiday Bayou	Small Improve	1	100
Whitaker Bayou (Man)	Improve	2	50
Clower Creek	Small Improve	1	100
Phillippi Creek (Man)	Improve	2	50
Pearce Drain	Outside	3	NA

**Table 2-6
SBEP Outfall Prioritization Study Tributary Scoring Matrix**

Major Basin	Verified Impaired Parameter		
	Parameter	Rank	Score
Phillippi Creek	T & Fecal Coliform(RB)	1	100
Sarasota Bay Coastal			0
Little Sarasota Bay Coastal			0
Sarasota Bay			0
Whitaker Bayou			0
Curry Creek	Nutrients*	2	25
South Creek	Nutrients*	2	25
Bowlees Creek	Nutrients (chl a) T&F	1	100
Cedar Hammock	Nutrients, bacteria	1	100
Catfish Creek	Nutrients*	2	25
Matheny Creek	Nutrients(RB)*	2	25
Hudson Bayou			0
Longboat Key			0
North Creek	Nutrients*	2	25
Anna Maria Isl.			0
Palma Sola Drain	Nutrients(T&F), bacteria	1	100
Elligraw Bayou	Nutrients, DO, Coliforms*	2	25
Holiday Bayou			
Whitaker Bayou (Man)			
Clower Creek	Coliforms	1	100
Phillippi Creek (Man)	T&F Coliform, Nutrients(RB)	1	100
Pearce Drain			0

The individual scores for the various categories are then summed to give an overall score for each major tributary basin as provided in Table 2-7. The basin with the highest score would be considered to be the most important in terms of pollutant loads to the bay. The top 5 ranked basins in order are Phillippi Creek, Cedar Hammock, Bowlees Creek, Hudson bayou and Whitaker Bayou.

**Table 2-7
SBEP Outfall Prioritization Study Tributary Scoring Matrix**

Summary		
Basin	Total Score	Rank
Phillippi Creek	722	1
Cedar Hammock	500	2
Bowlees Creek	434	3
Hudson Bayou	363	4
Whitaker Bayou	346	5
Palma Sola Drain	329	6
Sarasota Bay Coastal	327	7
Whitaker Bayou (Man)	322	8
Matheny Creek	316	9
Clower Creek	290	10
Anna Maria Isl.	272	11
Sarasota Bay	269	12
Holiday Bayou	263	13
Little Sarasota Bay Coastal	260	14
Longboat Key	251	15
Phillippi Creek (Man)	248	16
Catfish Creek	240	17
Elligraw Bayou	216	18
North Creek	177	19
South Creek	175	20
Curry Creek	128	21
Pearce Drain	80	22

3.0 OUTFALL PRIORITIZATION

The location and size of all major outfalls in Sarasota County were obtained in the form of GIS shapefiles from Sarasota County and the location and size of all major outfalls in Manatee County were obtained in the form of GIS shapefiles from Manatee County. For the purposes of this study, only those outfalls with a diameter of at least 36-inches were included. Maps with outfall locations are given in Figure 3-1 for Manatee County and in Figures 3-2 and 3-3 for Sarasota County. Outfalls with a cross sectional area of approximately 7000 square inches or greater are given a score of 100. Only 9 outfalls have a cross sectional area of 7000 square inches or greater. All of these outfalls are in Sarasota County. Outfalls with a cross sectional area less than 7000 square inches are given a score less than 100 using the ratio of the outfall area to 7000 times 100. The cross section area scoring for Manatee County outfalls is provided in Table 3-1.

**Table 3-1
Summary of Sarasota Bay Manatee County Outfall Cross Sectional Area Scores**

Object ID	Pipe Shape	Depth	Width	Outfall Cross Section Area (in ²)	Outfall Cross Section Area Score
558	Round	50	50	2500	41.7
403	Round	60	60	3600	60
544	Round	36	36	1296	21.6
495	Round	60	60	3600	60
339	Round	36	36	1296	21.6
48	Round	36	36	1296	21.6
119	Round	36	36	1296	21.6
523	Round	36	36	1296	21.6
580	Round	36	36	1296	21.6
153	Round	48	48	2304	38.4
420	Round	48	48	2304	38.4
36	Round	54	54	2916	48.6
211	Elliptical	48	60	2880	48
317	Round	50	50	2500	41.7
161	Round	48	48	2304	38.4
85	Round	48	48	2304	38.4
375	Round	36	36	1296	21.6
347	Elliptical	36	48	1728	28.8
451	Elliptical	36	48	1728	28.8
528	Elliptical	36	48	1728	28.8
10	Round	36	36	1296	21.6

Table 3-1 (continued)
Summary of Sarasota Bay Manatee County Outfall Cross Sectional Area Scores

Object ID	Pipe Shape	Depth	Width	Outfall Cross Section Area (in ²)	Outfall Cross Section Area Score
147	Round	36	36	1296	21.6
360	Round	36	36	1296	21.6
380	Round	36	36	1296	21.6
398	Round	36	36	1296	21.6
67	Round	48	48	2304	38.4
535	Round	54	54	2916	48.6
132	Round	48	48	2304	38.4
86	Round	36	36	1296	21.6
133	Round	36	36	1296	21.6
350	Round	36	36	1296	21.6
345	Round	36	36	1296	21.6
173	Round	36	36	1296	21.6
301	Round	36	36	1296	21.6
393	Round	36	36	1296	21.6
460	Round	36	36	1296	21.6
540	Round	36	36	1296	21.6
30	Round	48	48	2304	38.4
276	Round	36	36	1296	21.6
453	Round	36	36	1296	21.6
243	Round	36	36	1296	21.6
484	Rectangular	60	60	3600	60
407	Round	48	48	2304	38.4
322	Elliptical	36	48	1728	28.8
108	Round	36	36	1296	21.6
162	Round	36	36	1296	21.6
238	Round	36	36	1296	21.6
364	Round	36	36	1296	21.6
454	Round	36	36	1296	21.6

A distance score is also calculated for each outfall. Outfalls discharging within 1000 feet of the bay are given a score of 100; outfalls discharging within 1000-5000 feet of the bay are given a score of 75; outfalls discharging within 5000- 10,000 feet of the bay are given a score of 50; outfalls discharging within 10,000- 15,000 feet of the bay are given a score of 25 and outfalls greater than 15,000 feet from the bay are given a score of 0. The distance scoring for Manatee County outfalls is provided in Table 3-2.

**Table 3-2
Summary of Sarasota Bay Manatee County Outfall Distance Scores**

Location/Basin	Distance to Bay (ft)	Distance Score
Bowlees Creek	165	100
Sarasota Bay	773	100
Bowless Creek Oneco Drain	2	100
Palma Sola Drain	1324.8	75
Cedar Hammock West	1806.5	75
Sarasota Bay	131	100
Sarasota Bay	383	100
BRADENTON BEACH/Sarasota Bay	1	100
Sarasota Bay	214.9	100
Cedar Hammock South	7408.9	50
Cedar Hammock South	6458.2	50
BPD AIRPORT DRAIN/Bowlees Creek	7586.5	50
BPD AIRPORT DRAIN/Bowlees Creek	5808.7	50
BPD AIRPORT DRAIN/Bowlees Creek	5721.1	50
Sarasota Bay	2405.5	75
BPD AIRPORT DRAIN/Bowlees Creek	6599.7	50
Cedar Hammock South	8144.2	50
Bowlees Creek	8000	50
Bowlees Creek Oneco Drain	7360.7	50
Bowlees Creek	8154.5	50
BPD AIRPORT DRAIN/Bowlees Creek	6926.97	50
BPD AIRPORT DRAIN/Bowlees Creek	6256.5	50
BPD AIRPORT DRAIN/Bowlees Creek	8277.3	50
Bowless Creek Oneco Drain	7964.4	50
Bowlees Creek	9264.3	50
Cedar Hammock West	13378.8	25
Bowlees Creek	14706	25
Bowlees Creek	11473.96	25
Cedar Hammock West	11812	25
Cedar Hammock South	11310	25
Cedar Hammock South	11775.7	25
Pearce Drain	1639.8	75
Bowlees Creek	14160.8	25
Bowlees Creek Oneco Drain	11338.6	25
Bowlees Creek	14706	25
Bowlees Creek	10709	25

Table 3-2 (continued)
Summary of Sarasota Bay Manatee County Outfall Distance Scores

Location/Basin	Distance to Bay (ft)	Distance Score
Bowlees Creek	12391.8	25
BPD AIRPORT DRAIN/Bowlees Creek	21617.4	0
Cedar Hammock East	18529.9	0
Cedar Hammock East	19833.3	0
Bowlees Creek Oneco Drain	25390	0
Pearce Drain	33026.6	0
Pearce Drain	26501.7	0
Pearce Drain	15888.2	0
Pearce Drain	25094	0
Pearce Drain	24415.7	0
Pearce Drain	33333	0
Pearce Drain	19261.3	0
Pearce Drain	36946.5	0

Similar scoring results for Sarasota County outfalls based on cross sectional area and distance to bay are given in Tables 3-3 and 3-4.

Table 3-3
Summary of Sarasota Bay Sarasota County Outfall Cross Section Scores

Object ID	Pipe Shape	Depth	Width	Outfall Cross Section Area (in ²)	Outfall Cross Section Area Score
362	Round	84	84	7056	100
409	Rectangular	60	120	7200	100
329	Rectangular	108	180	19440	100
357	Rectangular	96	144	13824	100
8	Rectangular	72	72	5184	86.4
342	Rectangular	72	96	6912	100
407	Round	66	66	4356	72.6
4	Rectangular	96	48	4608	76.8
416	Rectangular	120	132	15840	100
330	Round	48	48	2304	38.4
358	Rectangular	84	144	12096	100
354	Round	72	72	5184	86.4
328	Elliptical	79	117	9243	100

Table 3-3 (continued)
Summary of Sarasota Bay Sarasota County Outfall Cross Section Scores

Object ID	Pipe Shape	Depth	Width	Outfall Cross Section Area (in²)	Outfall Cross Section Area Score
3	Round	54	54	2916	48.6
361	Elliptical	83	128	10624	100
963	Elliptical	52	77	4004	66.73
471	Round	72	72	5184	86.4
451	Round	48	48	2304	38.4
457	Round	72	72	5184	86.4
661	Round	60	60	3600	60
7	Rectangular	48.5	48	2328	38.8
13	Round	48	48	2304	38.4
365	Rectangular	120	72	8640	100
24	Round	60	60	3600	60
401	Rectangular	84	84	7056	100
6	Round	38	38	1444	24.07
961	Rectangular	60	96	5760	96
1	Round	36	36	1296	21.6
5	Rectangular	24	48	1152	19.2
477	Round	48	48	2304	38.4
402	Round	48	48	2304	38.4
340	Elliptical	38	60	2280	38
454	Elliptical	38	60	2280	38
453	Elliptical	48	76	3648	60.8
28	Elliptical	48	76	3648	60.8
465	Elliptical	48	76	3648	60.8
674	Round	60	60	3600	60
322	Round	60	60	3600	60
356	Round	36	36	1296	21.6
355	Round	36	36	1296	21.6
343	Round	42	42	1764	29.4
31	Elliptical	43	68	2924	48.73
452	Round	54	54	2916	48.6
321	Round	54	54	2916	48.6
331	Round	48	48	2304	38.4
411	Elliptical	58	91	5278	87.97
669	Elliptical	38	60	2280	38
464	Round	36	36	1296	21.6

Table 3-3 (continued)
Summary of Sarasota Bay Sarasota County Outfall Cross Section Scores

Object ID	Pipe Shape	Depth	Width	Outfall Cross Section Area (in ²)	Outfall Cross Section Area Score
408	Elliptical	34	53	1802	30.03
681	Elliptical	34	53	1802	30.03
29	Round	42	42	1764	29.4
351	Rectangular	96	108	10368	100
702	Round	36	36	1296	21.6
683	Elliptical	29	45	1305	21.75
461	Round	36	36	1296	21.6
341	Round	36	36	1296	21.6
463	Elliptical	29	45	1305	21.75
348	Round	36	36	1296	21.6
367	Round	60	60	3600	60
676	Elliptical	24	38	912	15.2
668	Elliptical	24	38	912	15.2
691	Round	18	18	324	5.4
482	Round	30	30	900	15
688	Round	24	24	576	9.6
667	Elliptical	19	30	570	9.5
673	Elliptical	19	30	570	9.5
709	Round	24	24	576	9.6
684	Round	18	18	324	5.4
671	Round	18	18	324	5.4
664	Elliptical	14	23	322	5.37
670	Elliptical	12	18	216	3.6
368	Round	48	48	2304	38.4
366	Round	42	42	1764	29.4
665	Round	18	18	324	5.4
647	Round	42	42	1764	29.4
352	Round	48	48	2304	38.4
690	Round	36	36	1296	21.6
689	Round	18	18	324	5.4

**Table 3-4
Summary of Sarasota Bay Sarasota County Outfall Distance Scores**

Location/Basin	Distance to Bay (ft)	Distance Score
Phillippi Creek	5270.2	75
Hudson Bayou	84.7	100
Phillippi Creek	8291.5	50
Little Sarasota Bay Coastal	182.8	100
Sarasota Bay Coastal	10	100
Phillippi Creek	10447.6	25
Hudson Bayou	782.4	100
Sarasota Bay Coastal	0	100
Curry Creek	13744	100
Phillippi Creek	4520.9	75
Little Sarasota Bay Coastal	2209	75
Clower Creek	2572.7	75
Phillippi Creek	25042.2	0
Sarasota Bay Coastal	13.2	100
Matheny Creek	6373.4	50
Hudson Bayou	1750.1	75
Elligraw Bayou	4369	75
Phillippi Creek	6125.3	50
Phillippi Creek	31115	0
Hudson Bayou	1984.9	75
Sarasota Bay Coastal	12.3	100
Sarasota Bay Coastal	0	100
Catfish Creek	6995.4	50
Whitaker Bayou	4906.7	75
Hudson Bayou	13506.3	25
Sarasota Bay Coastal	607.9	100
Whitaker Bayou	13506.3	25
Sarasota Bay Coastal	0	100
Sarasota Bay Coastal	526.3	100
Hudson Bayou	2401.4	75
Hudson Bayou	4031.3	75
Phillippi Creek	13705.2	25
Phillippi Creek	10773.8	25
Phillippi Creek	16275.2	0
Phillippi Creek	28331.5	0
North Creek	3171.3	75

Table 3-4 (continued)
Summary of Sarasota Bay Sarasota County Outfall Distance Scores

Location/Basin	Distance to Bay (ft)	Distance Score
Phillippi Creek	31305.5	0
Phillippi Creek	42062.5	0
Little Sarasota Bay Coastal	249.4	100
Little Sarasota Bay Coastal	249.4	100
Phillippi Creek	10427	25
Phillippi Creek	18026.9	0
Phillippi Creek	15756.6	0
Phillippi Creek	37122.3	0
Phillippi Creek	45420.9	0
Hudson Bayou	84372.4	0
Phillippi Creek	45533.8	0
Little Sarasota Bay Coastal	1282.9	75
Hudson Bayou	6918.6	50
Phillippi Creek	34165.7	0
Phillippi Creek	25577.4	0
South Creek	15737.1	0
Hudson Bayou	7179.4	50
Phillippi Creek	31354.3	0
Phillippi Creek	24431.4	0
Phillippi Creek	18417.8	0
North Creek	2952.1	75
North Creek	4890	75
Catfish Creek	13778.9	25
Phillippi Creek	41295.9	0
Phillippi Creek	45696.1	0
Catfish Creek	3230.2	75
Whitaker Bayou	7010.8	50
Phillippi Creek	17436.6	0
Phillippi Creek	43940.6	0
Phillippi Creek	43800	0
Whitaker Bayou	9651.2	50
Phillippi Creek	16414.2	0
Phillippi Creek	48398.3	0
South Creek	3386.3	75
Phillippi Creek	48564.9	0
Catfish Creek	13254	25

Table 3-4 (continued)
Summary of Sarasota Bay Sarasota County Outfall Distance Scores

Location/Basin	Distance to Bay (ft)	Distance Score
Catfish Creek	13820.9	25
North Creek	8800.8	50
Whitaker Bayou	14155.5	0
South Creek	23781.4	0
Catfish Creek	15854.7	0
Catfish Creek	19459.8	0

The individual scores based on basin tributary loads, cross sectional area and distance to bay are then summed to determine the total outfall score as shown in Table 3-5. The outfall with the highest score is ranked 1, the outfall with the next highest score is ranked 2 and so on. A total of 127 stormwater outfalls were scored and ranked. Two of the top 25 ranked outfalls are in Manatee County and the remaining 23 outfalls are in Sarasota County. The location of these outfalls is shown in Figures 3-1, 3-2 and 3-3. Conceptual designs for the top 25 ranked outfalls are presented in Section 4.

Table 3-5
Summary of Sarasota Bay Outfall Scores and Rank

Outfall ID	Size Score	Basin Score	Distance Score	Final Score	Final Rank	County
362	100	100	75	275	1	S
409	100	50.3	100	250.3	2	S
329	100	100	50	250	3	S
357	100	36	100	236	4	S
8	86.4	45.3	100	231.7	5	S
342	100	100	25	225	6	S
407	72.6	50.3	100	222.9	7	S
4	76.8	45.3	100	222.1	8	S
416	100	17.7	100	217.7	9	S
330	38.4	100	75	213.4	10	S
358	100	36	75	211	11	S
558	41.7	60.1	100	201.8	12	M
354	86.4	40.2	75	201.6	13	S
328	100	100	0	200	14	S
403	60	37.3	100	197.3	15	M
3	48.6	45.3	100	193.9	16	S
361	100	43.8	50	193.8	17	S
963	66.7	50.3	75	192	18	S
471	86.4	29.9	75	191.3	19	S

Table 3-5 (continued)
Summary of Sarasota Bay Outfall Scores and Rank

Outfall ID	Size Score	Basin Score	Distance Score	Final Score	Final Rank	County
451	38.4	100	50	188.4	20	S
457	86.4	100	0	186.4	21	S
661	60	50.3	75	185.3	22	S
7	38.8	45.3	100	184.1	23	S
13	38.4	45.3	100	183.7	24	S
365	100	33.2	50	183.2	25	S
24	60	47.9	75	182.9	26	S
10	21.6	60.1	100	181.7	27	M
495	60	45.6	75	180.6	28	M
401	100	50.3	25	175.3	29	S
6	24.1	45.3	100	169.4	30	S
961	96	47.9	25	168.9	31	S
1	21.6	45.3	100	166.9	32	S
339	21.6	69.3	75	165.9	33	M
5	19.2	45.3	100	164.5	34	S
477	38.4	50.3	75	163.7	35	S
402	38.4	50.3	75	163.7	36	S
340	38	100	25	163	37	S
454	38	100	25	163	38	S
453	60.8	100	0	160.8	39	S
28	60.8	100	0	160.8	40	S
465	60.8	24.5	75	160.3	41	S
674	60	100	0	160	42	S
322	60	100	0	160	43	S
48	21.6	37.3	100	158.9	44	M
119	21.6	37.3	100	158.9	45	M
523	21.6	37.3	100	158.9	46	M
580	21.6	37.3	100	158.9	47	M
36	48.6	60.1	50	158.7	48	M
211	48	60.1	50	158.1	49	M
153	38.4	69.3	50	157.7	50	M
420	38.4	69.3	50	157.7	51	M
356	21.6	36	100	157.6	52	S
355	21.6	36	100	157.6	53	S
343	29.4	100	25	154.4	54	S
317	41.7	60.1	50	151.8	55	M
161	38.4	37.3	75	150.7	56	M
31	48.7	100	0	148.7	57	S
452	48.6	100	0	148.6	58	S
321	48.6	100	0	148.6	59	S
85	38.4	60.1	50	148.5	60	M

Table 3-5 (continued)
Summary of Sarasota Bay Outfall Scores and Rank

Outfall ID	Size Score	Basin Score	Distance Score	Final Score	Final Rank	County
375	21.6	69.3	50	140.9	61	M
347	28.8	60.1	50	138.9	62	M
451	28.8	60.1	50	138.9	63	M
528	28.8	60.1	50	138.9	64	M
331	38.4	100	0	138.4	65	S
411	88	50.3	0	138.2	66	S
669	38	100	0	138	67	S
535	48.6	60.1	25	133.7	68	M
67	38.4	69.3	25	132.7	69	M
464	21.6	36	75	132.6	70	S
544	21.6	60.1	50	131.7	71	M
147	21.6	60.1	50	131.7	72	M
360	21.6	60.1	50	131.7	73	M
380	21.6	60.1	50	131.7	74	M
398	21.6	60.1	50	131.7	75	M
408	30	50.3	50	130.3	76	S
681	30	100	0	130	77	S
29	29.4	100	0	129.4	78	S
351	100	24.2	0	124.2	79	S
132	38.4	60.1	25	123.5	80	M
702	21.6	50.3	50	121.9	81	S
683	21.8	100	0	121.8	82	S
461	21.6	100	0	121.6	83	S
341	21.6	100	0	121.6	84	S
463	21.8	24.5	75	121.3	85	S
348	21.6	24.5	75	121.1	86	S
367	60	33.2	25	118.2	87	S
86	21.6	69.3	25	115.9	88	M
133	21.6	69.3	25	115.9	89	M
350	21.6	69.3	25	115.9	90	M
676	15.2	100	0	115.2	91	S
668	15.2	100	0	115.2	92	S
691	5.4	33.2	75	113.6	93	S
482	15	47.9	50	112.9	94	S
688	9.6	100	0	109.6	95	S
667	9.5	100	0	109.5	96	S
673	9.5	100	0	109.5	97	S
345	21.6	11.1	75	107.7	98	M
709	9.6	47.9	50	107.5	99	S
173	21.6	60.1	25	106.7	100	M
301	21.6	60.1	25	106.7	101	M

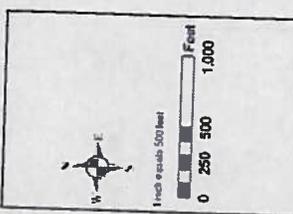
**Table 3-5 (continued)
Summary of Sarasota Bay Outfall Scores and Rank**

Outfall ID	Size Score	Basin Score	Distance Score	Final Score	Final Rank	County
393	21.6	60.1	25	106.7	102	M
460	21.6	60.1	25	106.7	103	M
540	21.6	60.1	25	106.7	104	M
684	5.4	100	0	105.4	105	S
671	5.4	100	0	105.4	106	S
664	5.4	24.2	75	104.6	107	S
670	3.6	100	0	103.6	108	S
30	38.4	60.1	0	98.5	109	M
368	38.4	33.2	25	96.6	110	S
276	21.6	69.3	0	90.9	111	M
453	21.6	69.3	0	90.9	112	M
366	29.4	33.2	25	87.6	113	S
243	21.6	60.1	0	81.7	114	M
665	5.4	24.5	50	79.9	115	S
647	29.4	47.9	0	77.3	116	S
484	60	11.1	0	71.1	117	M
352	38.4	24.2	0	62.6	118	S
690	21.6	33.2	0	54.8	119	S
407	38.4	11.1	0	49.5	120	M
322	28.8	11.1	0	39.9	121	M
689	5.4	33.2	0	38.6	122	S
108	21.6	11.1	0	32.7	123	M
162	21.6	11.1	0	32.7	124	M
238	21.6	11.1	0	32.7	125	M
364	21.6	11.1	0	32.7	126	M
454	21.6	11.1	0	32.7	127	M

9

Sarasota Bay Estuary Program
Outfall Prioritization Project
Top 25 Reivers Outfalls
Shown on this map
Outfall(s) 08

- Legend**
- Stormwater
 - High Priority (1) Federal Response Zone
 - High Priority (2) Federal Response Zone
 - High Priority (3) Federal Response Zone
 - High Priority (4) Federal Response Zone
 - High Priority (5) Federal Response Zone
 - High Priority (6) Federal Response Zone
 - High Priority (7) Federal Response Zone
 - High Priority (8) Federal Response Zone
 - High Priority (9) Federal Response Zone
 - High Priority (10) Federal Response Zone
 - High Priority (11) Federal Response Zone
 - High Priority (12) Federal Response Zone
 - High Priority (13) Federal Response Zone
 - High Priority (14) Federal Response Zone
 - High Priority (15) Federal Response Zone
 - High Priority (16) Federal Response Zone
 - High Priority (17) Federal Response Zone
 - High Priority (18) Federal Response Response Area
 - High Priority (19) Federal Response Area
 - High Priority (20) Federal Response Area
 - High Priority (21) Federal Response Area
 - High Priority (22) Federal Response Area
 - High Priority (23) Federal Response Area
 - High Priority (24) Federal Response Area
 - High Priority (25) Federal Response Area



**Sarasota Bay Estuary Program
Outfall Prioritization Project**

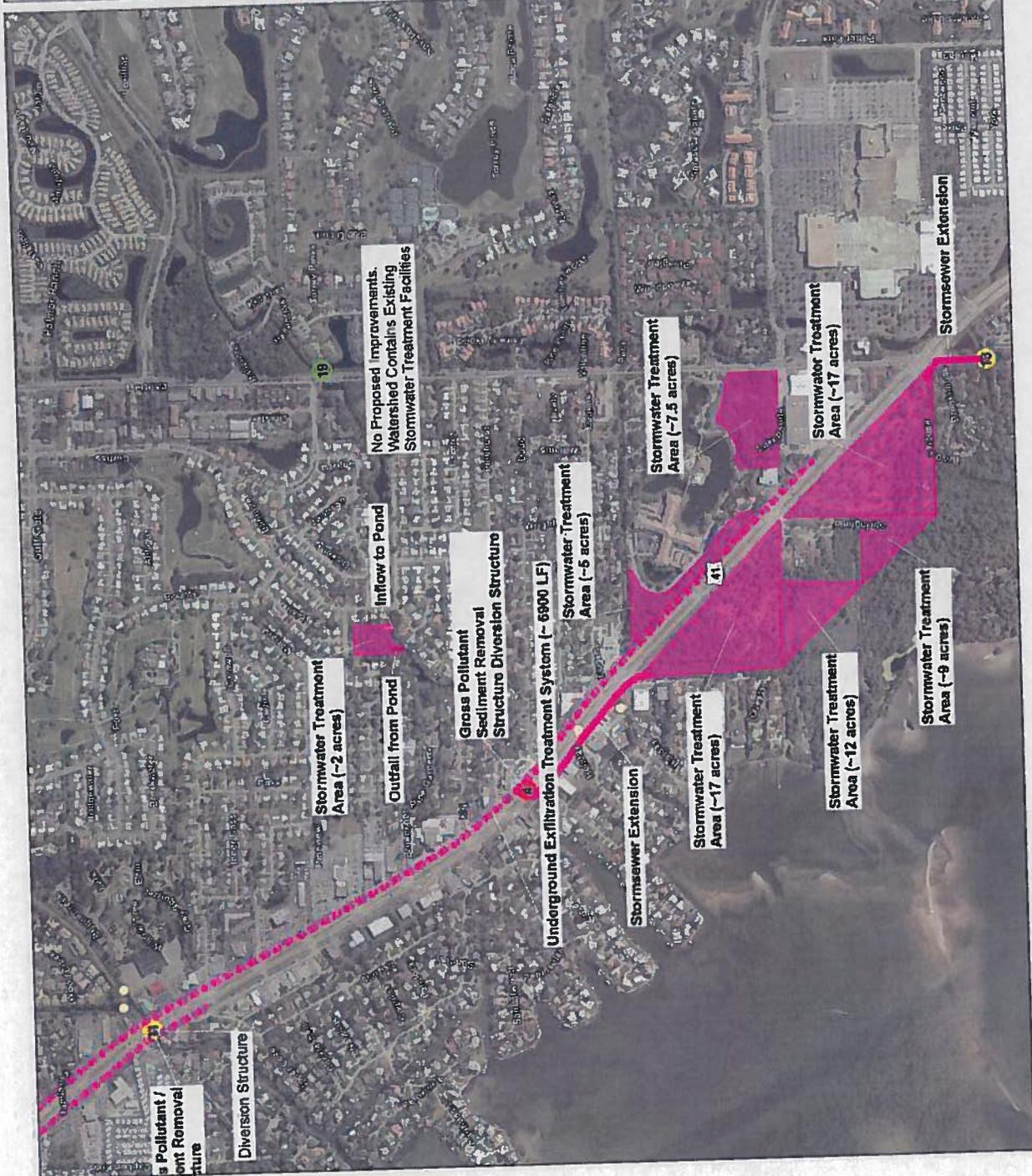
Top 25 Ranked Outfalls
Shown on this map
Outfalls 04, 13 and 19

Legend

- Stormwater Treatment
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
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- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area
- Stormwater Treatment Area

1 inch equals 500 feet

0 250 500 1,000 Feet



No Proposed Improvements.
Watershed Contains Existing
Stormwater Treatment Facilities

Inflow to Pond

Stormwater Treatment
Area (~2 acres)

Outfall from Pond

Gross Pollutant
Sediment Removal
Structure Diversion Structure

Underground Exfiltration Treatment System (~ 6900 LF)

Stormwater Treatment
Area (~5 acres)

Stormwater Treatment
Area (~7.5 acres)

Stormwater Treatment
Area (~17 acres)

Stormwater Treatment
Area (~12 acres)

Stormwater Treatment
Area (~9 acres)

Stormwater Treatment
Area (~17 acres)

Stormwater Treatment
Area (~12 acres)

Stormwater Treatment
Area (~9 acres)

Stormwater Extension

Stormwater Extension

20

Sarasota Bay Estuary Program
Outfall Prioritization Project

Top 25 Ranked Outfalls
Shown on this map
Outfall # 20

Legend

- 1. Potential Inflow
- 2. High Priority Suburban Inflow
- 3. High Priority Suburban Inflow
- 4. High Priority Suburban Inflow
- 5. High Priority Suburban Inflow
- 6. High Priority Suburban Inflow
- 7. High Priority Suburban Inflow
- 8. High Priority Suburban Inflow
- 9. High Priority Suburban Inflow
- 10. High Priority Suburban Inflow
- 11. High Priority Suburban Inflow
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- 13. High Priority Suburban Inflow
- 14. High Priority Suburban Inflow
- 15. High Priority Suburban Inflow
- 16. High Priority Suburban Inflow
- 17. High Priority Suburban Inflow
- 18. High Priority Suburban Inflow
- 19. High Priority Suburban Inflow
- 20. High Priority Suburban Inflow
- 21. High Priority Suburban Inflow
- 22. High Priority Suburban Inflow
- 23. High Priority Suburban Inflow
- 24. High Priority Suburban Inflow
- 25. High Priority Suburban Inflow

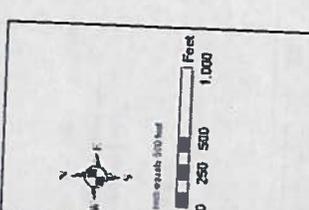
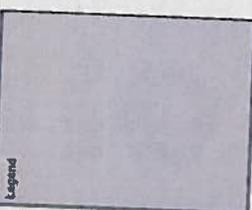
1 inch equals 500 feet

0 250 500 1,000 Feet



14

Sarasota Bay Estuary Program
Outfall Prioritization Project
Top 25 Ranked Outfalls
Shown on this map
Outfall # 14



Sarasota Bay Estuary Program
Outfall Prioritization Project

Top 25 Ranked Outfalls
 Shown on this map
 Outfall(s) 15

Legend

- Rank 1
- Rank 2
- Rank 3
- Rank 4
- Rank 5
- Rank 6
- Rank 7
- Rank 8
- Rank 9
- Rank 10
- Rank 11
- Rank 12
- Rank 13
- Rank 14
- Rank 15
- Rank 16
- Rank 17
- Rank 18
- Rank 19
- Rank 20
- Rank 21
- Rank 22
- Rank 23
- Rank 24
- Rank 25



Sarasota Bay Estuary Program
Outfall Prioritization Project

Top 25 Ranked Outfalls
 Shown on this map
 Contour(s) 10

Legend

- Existing structure
- New Pollutant / Sediment Removal Structure
- New Stormwater Extension
- New Gross Pollutant / Sediment Removal Structure
- New Underground Exfiltration Treatment System
- New Diversion Structure
- New Convert Drainage System To Swales / Bioretention In Watershed

1 inch equals 500 feet
 0 250 500 1,000 Feet



SARASOTA BAY ESTUARY PROGRAM
 Restoring Our Bay



**Sarasota Bay Estuary
Program
Outfall Prioritization
Project**
Top 25 Ranked Outfalls
Shown on this map
Outfall #: 19

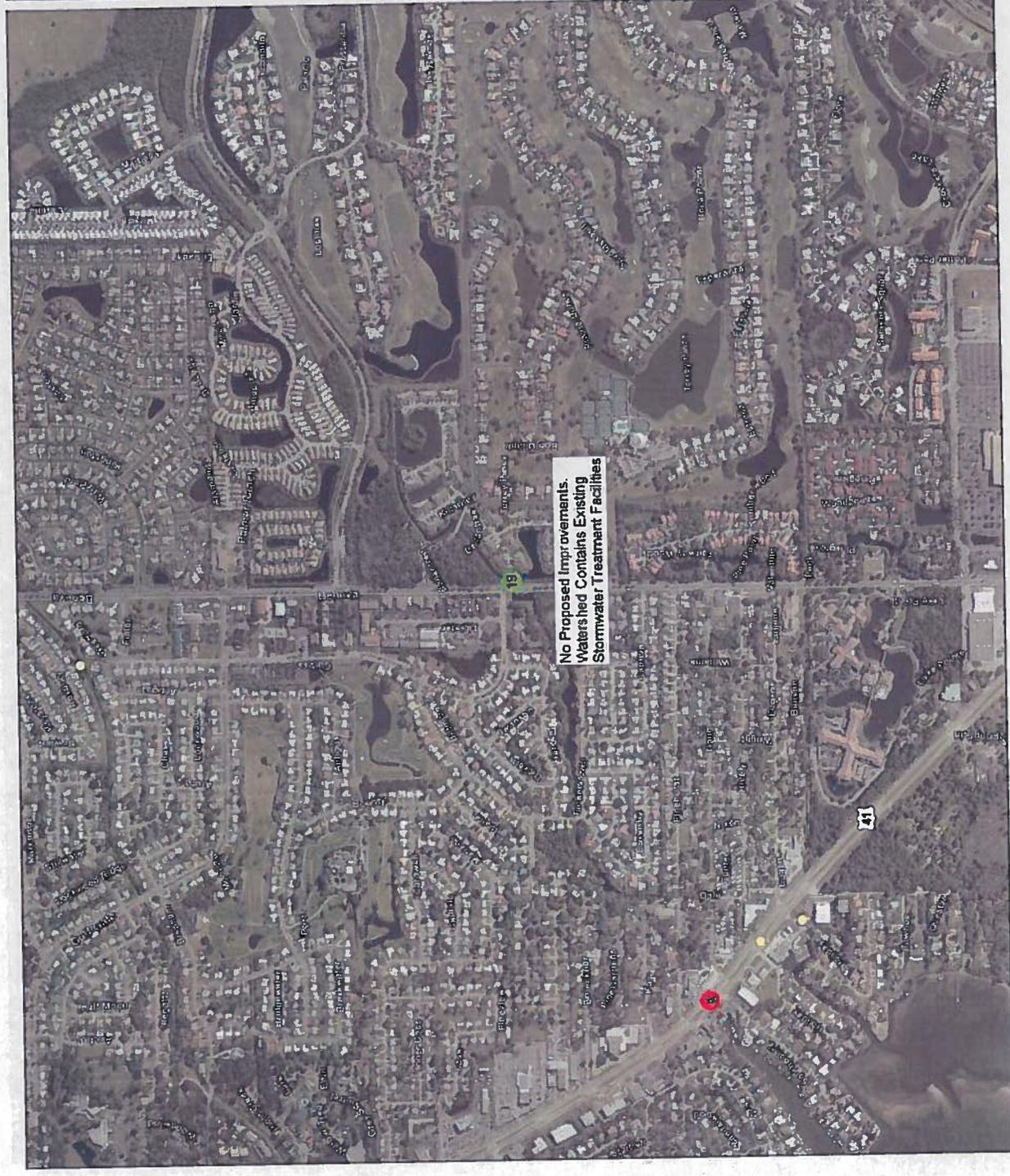
Legend



1 inch equals 500 feet
0 250 500 1,000 Feet



**SARASOTA BAY
ESTUARY PROGRAM**
Preserving Our Bays



No Proposed Improvements.
Watershed Contains Existing
Stormwater Treatment Facilities

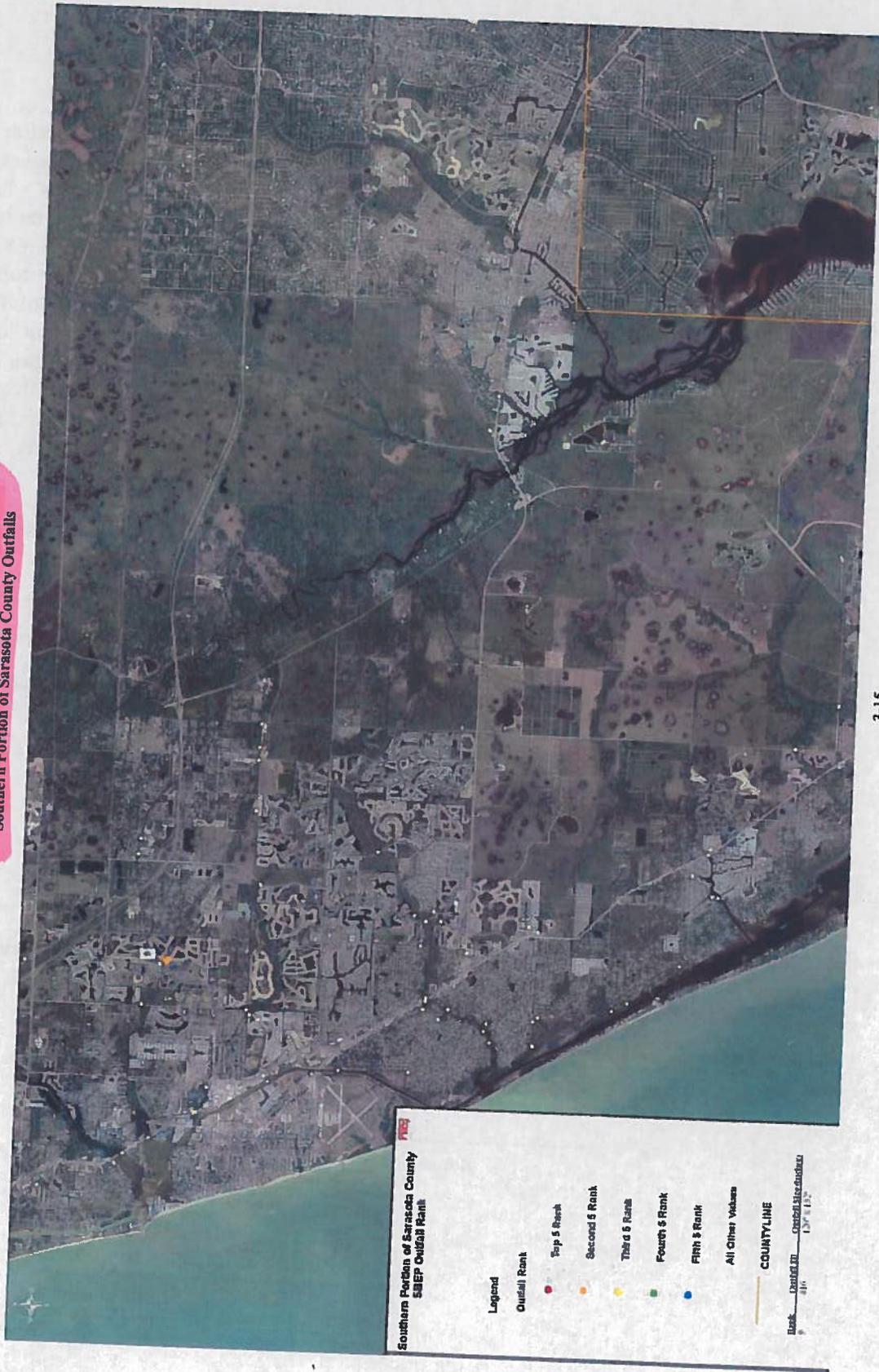
Figure 3-1
Manatee County Outfalls



Figure 3-2
Northern Portion of Sarasota County Outfalls



Figure 3-3
Southern Portion of Sarasota County Outfalls



4.0 CONCEPTUAL RETROFIT DESIGNS FOR THE TOP 25 RANKED OUTFALLS

Much of the Sarasota Bay watershed was developed prior to the implementation of stormwater treatment regulations for new development. Therefore, large quantities of untreated stormwater discharge directly to the bay or to surface water tributaries which discharge directly to the bay. The volume of stormwater runoff produced by a given land use is highly dependent on the amount of directly connected impervious area. If stormwater can flow across or through pervious area, a significant portion of the runoff from common rain events may infiltrate into the soils. This infiltration of runoff provides a direct reduction in the volume of stormwater runoff and the associated pollutant load. One method to reduce stormwater pollutant loads is to disconnect impervious areas and allow runoff to flow across pervious areas. For example, remove curbs and gutters in residential subdivisions and create a shallow swale/bioretention system along the sides of the street. Examples of swales and bioretention are provided in Figures 4-1 through 4-6 courtesy of FDEP.

Figure 4-1
Diagram of a Landscape Swale

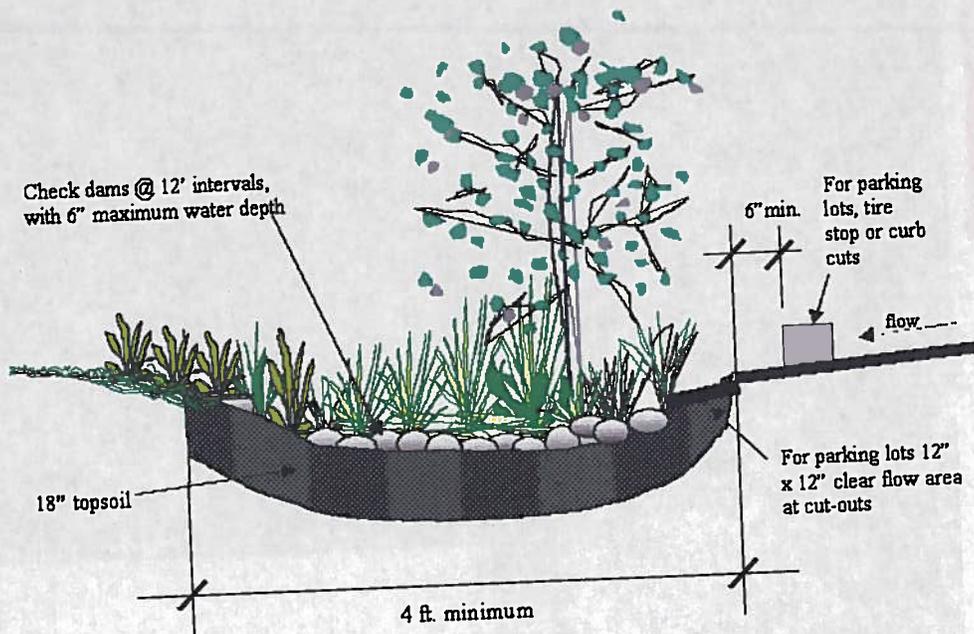


Figure 4-2
Example of Multifunctional Swale



Figure 4-3
Example of Landscape Swale



Figure 4-4
Diagram of Landscape Infiltration

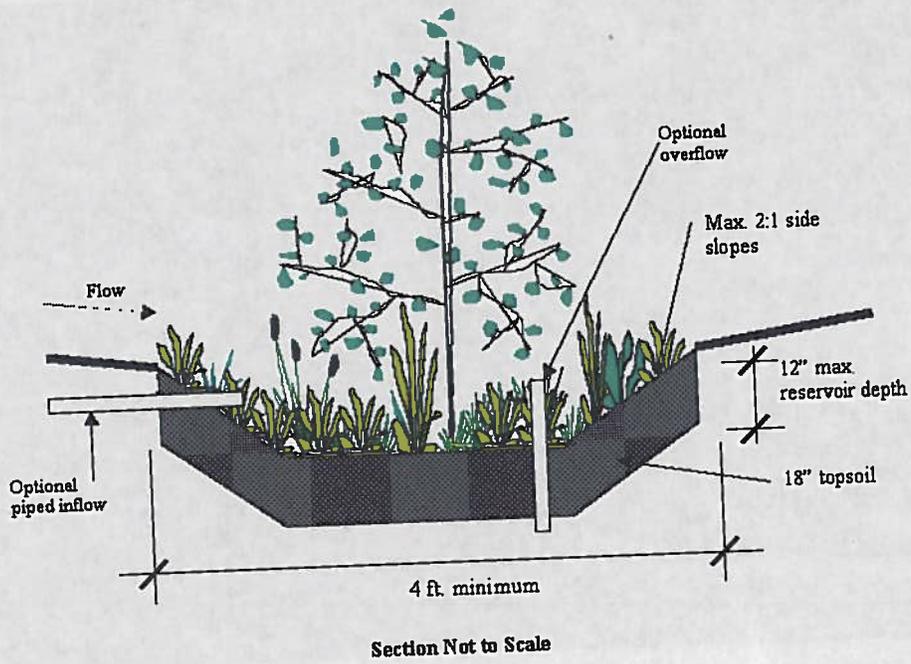


Figure 4-5
Buckman Heights Courtyard with Infiltration Green



Figure 4-6
Example of Bioretention Landscaping Parking Lot



Stormwater pollutants of primary concern to Sarasota Bay include trash, organic debris, sediment, nitrogen and fecal coliform bacteria. Trash, organic debris and sediment are commonly considered gross pollutants and can be removed relatively easily using various types of gross pollutant removal structures (GPRS) or trash/sediment traps. An example of one type of GPRS, a second generation baffle box from Suntree Technologies is given in Figure 4-7. GPRS require minimal land for installation and can normally be located near the outfall discharge and are relatively inexpensive when compared to more land intensive stormwater best management practices (BMPs). The removal of trash, organic debris and sediment is typically very cost effective and should be considered as an important first step in the retrofit process. The conceptual plans include features to remove gross pollutants from stormwater including gross pollutant/sediment removal structures and stormwater treatment areas. For stormwater treatment areas, traps, sumps and skimmers would be placed at the inflow to the stormwater treatment areas to remove gross pollutants.

Figure 4-7
Example Second Generation Baffle Box from Suntree Technologies



The removal of finer sediment, nitrogen and fecal coliform bacteria require more land intensive treatment methods including stormwater treatment areas (retention and detention practices). The type of treatment (retention vs. detention) to be used depends on the treatment area soil types and depth to seasonal high groundwater level. Retention provides the highest pollutant removal efficiencies but only can be constructed in areas with well drained soils and space between the bottom of the retention basin and the seasonal high groundwater level. A diagram of a typical dry retention basin is shown in Figures 4-8 and 4-9. Retention practices include swales, bioretention, underground exfiltration systems and dry basins. Underground exfiltration can be installed under pavement and therefore is useful in the absence of available land for the construction of a retention basin as shown in Figure 4-10. Also included in retention practices is the disconnection of impervious areas by directing runoff over grassed areas. Wet detention provides the next highest pollutant removal efficiency and can be constructed in areas with poorly drained soils and high groundwater table as shown in Figure 4-11.

Figure 4-8
Diagram of a Typical Swale System

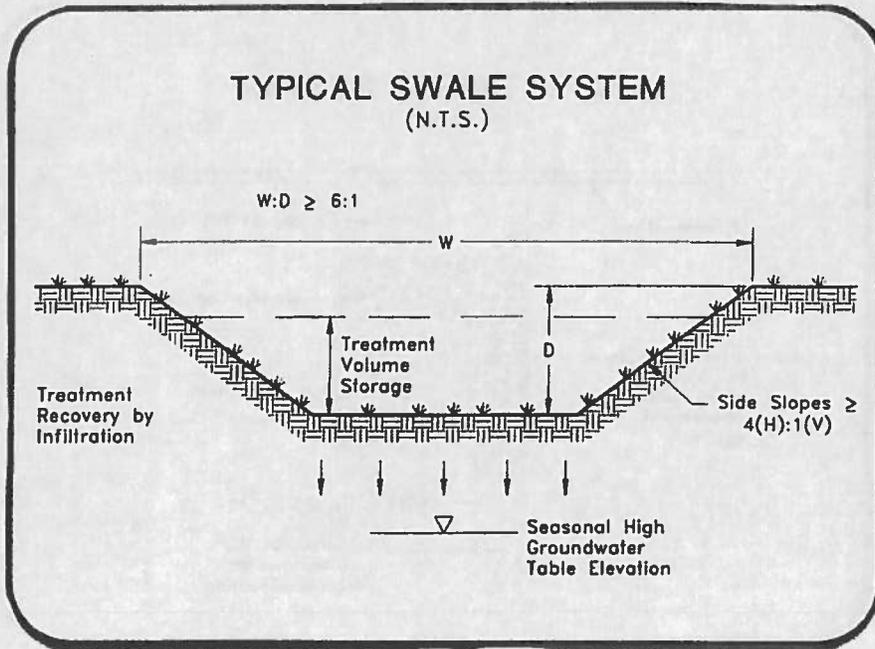


Figure 4-9
Diagram of a Typical Dry Retention System

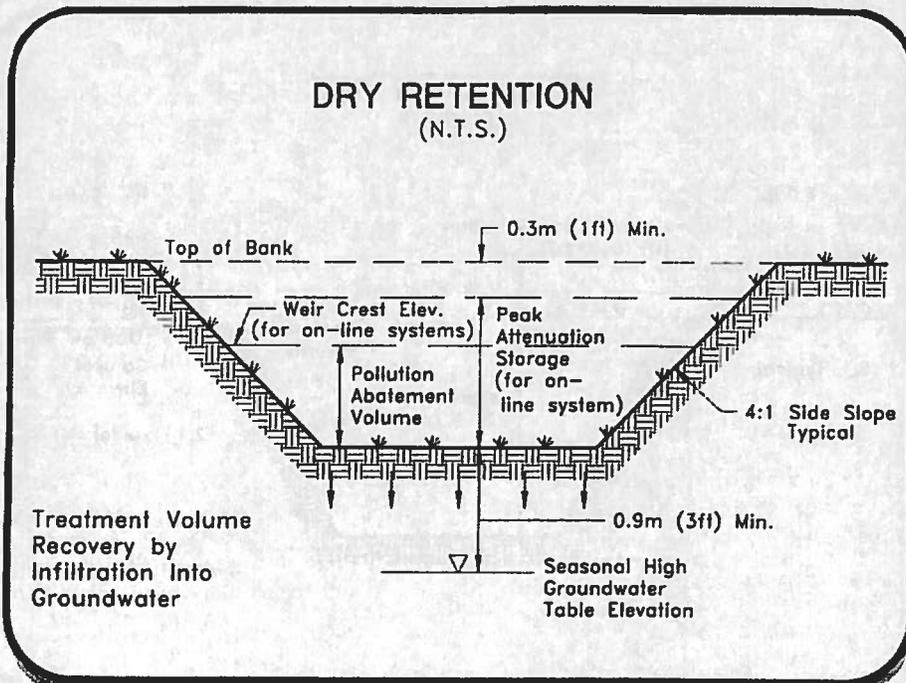


Figure 4-10
Diagram of a Typical Exfiltration System

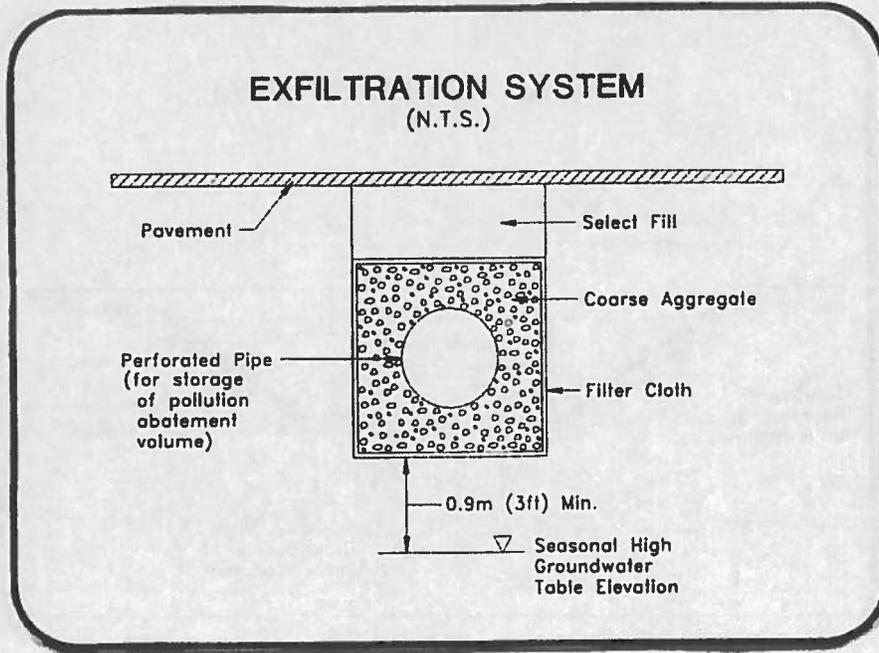
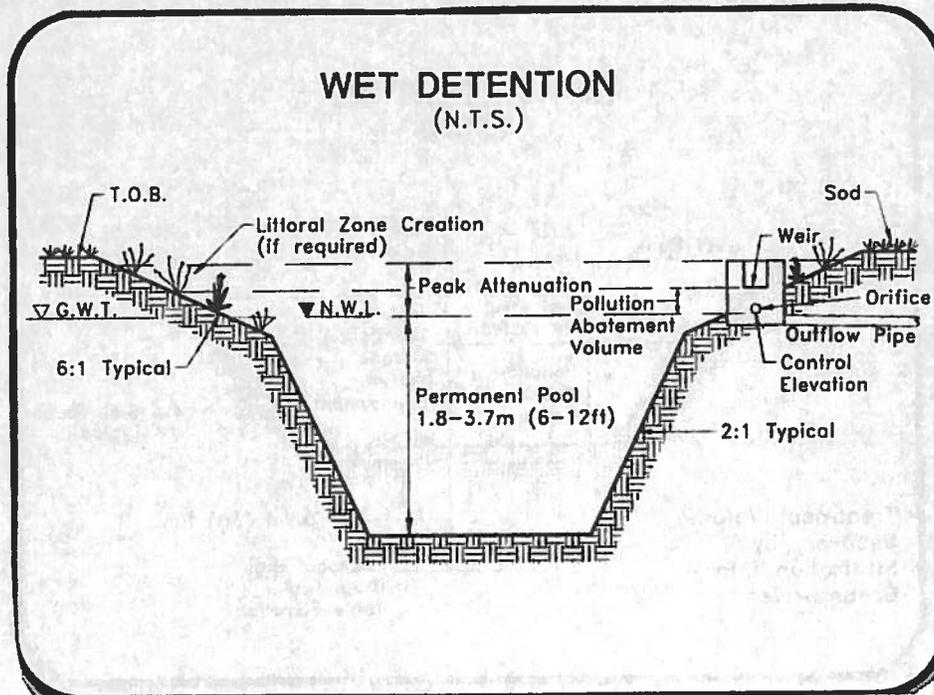


Figure 4-11
Diagram of a Typical Wet Detention System



Conceptual stormwater plans were developed for each of the top 25 ranked outfalls. If vacant land was identified close to the outfall, the plans reflect diversion structures and stormwater treatment areas for treatment. In some cases, multiple parcels were available for the construction of stormwater treatment areas and all are shown. Since the depth to the seasonal high groundwater table was not known, the type of treatment (retention vs. detention) is not specified. This will need to be determined during project design based on subsurface exploration. If no land was available close to the outfall, the plans show a combination of gross pollutant removal structures, underground exfiltration treatment systems and/or the conversion of curb and gutter drainage systems to swales/bioretention. The retrofit plan for each outfall includes the removal of gross pollutants using a gross pollutant removal structure (GPRS) or trash/sediment trap in a stormwater treatment area.

The conceptual stormwater retrofit plans for the top 25 ranked outfalls are provided in Appendix A. These should be considered a general guide for developing preliminary and final construction documents. The actual projects to be constructed will be largely based on sub-basin hydrology and hydraulics, land availability, the specific physical characteristics of selected sites and available construction funding. As a first level of treatment, it is recommended that projects be implemented to remove trash, organic debris and coarse sediment from all outfalls including the installation of gross pollutant removal structures or trash/sediment traps. The second level of treatment could be completed as more funding becomes available for the disconnection of directly connected impervious areas, the construction of swales and bioretention areas, the construction of stormwater treatment areas and the construction of underground exfiltration treatment systems. Priority should be given to the highest ranked outfalls.

The costs to construct stormwater retrofit facilities are highly variable depending on specific site characteristics, land cost, size of system, etc. Detailed construction cost estimates will need to be prepared during the preliminary design phase of each project. Conceptual unit costs for different types of treatment systems are given in Table 4-1. Example conceptual construction costs are provided for several outfall retrofits in Table 4-2.

Table 4-1
Conceptual Stormwater Retrofit Unit Construction Costs

Type of Treatment System	Cost	Comments
Convert to swale/bioretenention	\$8-12/cf of retention	No land required; provides more treatment than a retention basin due to infiltration in swale: 1 lf of 10 ft wide x 12" deep swale will provide 0.5" retention for 130 sf of area; typical lot and road area per lf of subdivision; Effective volume reduction estimated to be > 1" retention, effective cost is < \$4-6/cf
Construct bioretention areas	\$7-12/cf of retention	Cost highly dependent on land cost; 1 acre bioretention are will provide 0.5" retention for ~40 acres of area
Construct exfiltration treatment system	\$12-21/cf of retention	No land required; cost highly dependent on requirement to remove pavement to install; application dependent on depth to GWT
Construct gross pollutant/sediment removal structure	\$150,000-300,000 each	Primarily provides trash and sediment removal with some removal of particulate forms of nutrients, metals, etc.
Stormwater treatment area	\$200,000-300,000/acre + land cost	Highly variable, retention less costly than wet detention due to earthwork costs

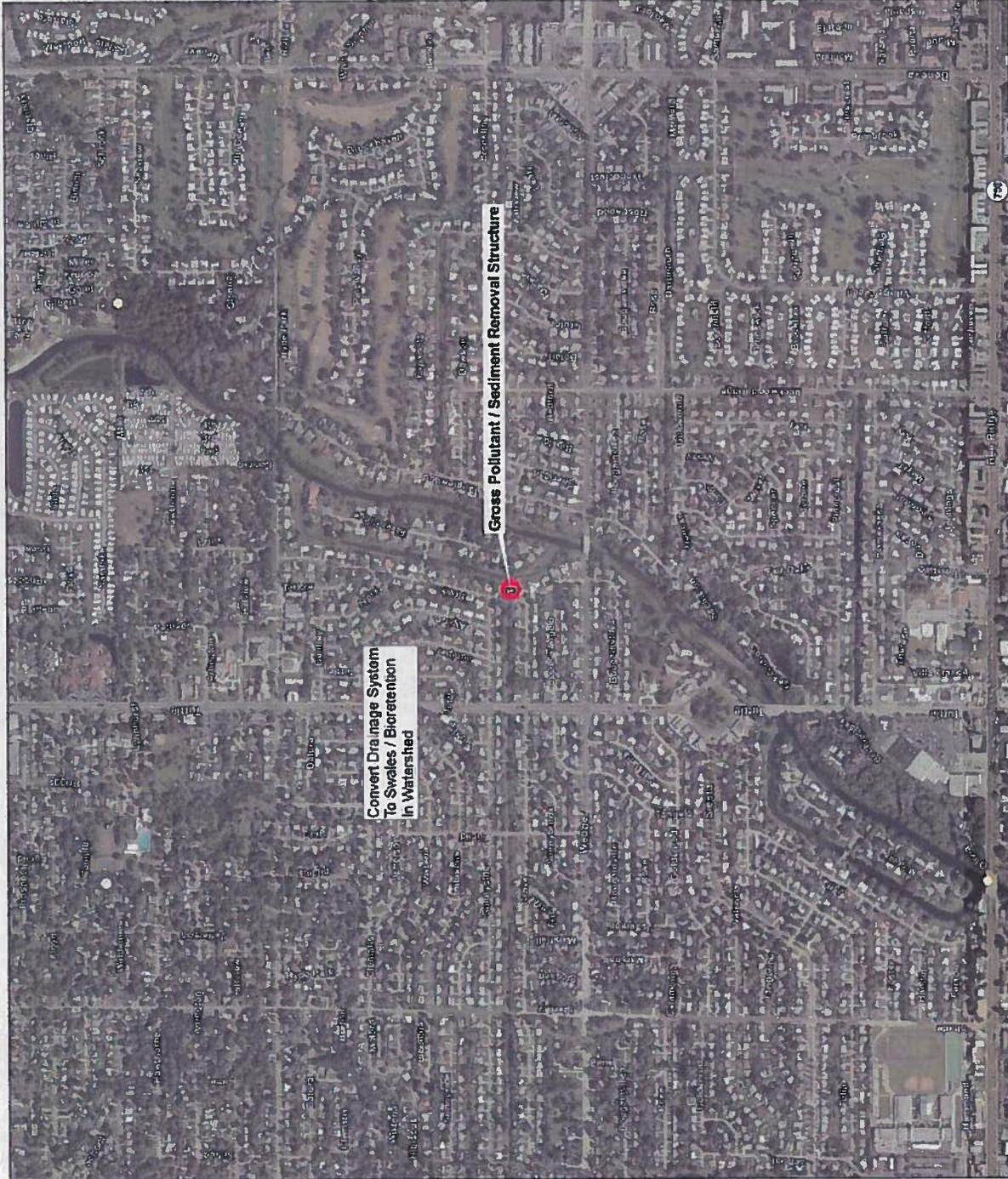
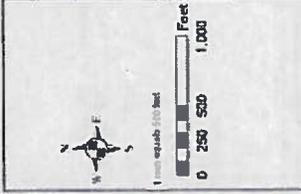
Table 4-2
Example Conceptual Stormwater Retrofit Construction Costs

Outfall Retrofit	Cost	Comments
Outfalls 1/17: Construct 37 acre bioretention area	\$9,250,000 + land cost	Provides 0.5" retention for 1,440 acres
Outfall 2/5: Construct 10 acre bioretention area; Construct 2 gross pollutant removal structures	\$3,100,000 + land cost	Provides 0.5" retention for 390 acres
Outfall 3: Construct gross pollutant removal structure; Convert 50,000 LF to swales/bioretenention	\$2,800,000	Provides 0.5" retention for 138 acres
Outfall 4/13/19: Construct 29 acre bioretention area; Construct gross pollutant removal structure	\$7,550,000	Provides 0.5" retention for 1,100 acres

Appendix A
Conceptual Stormwater Plans

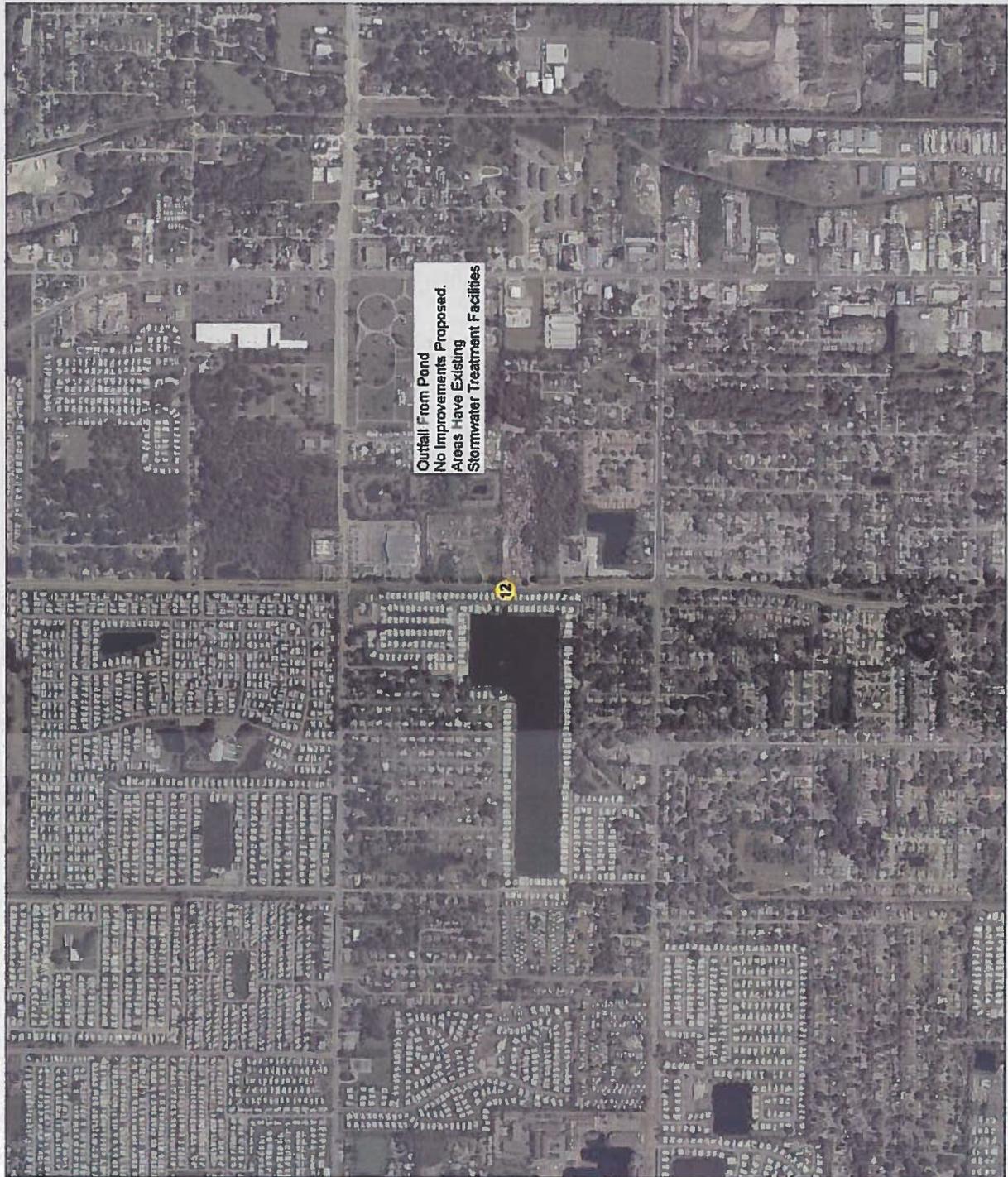
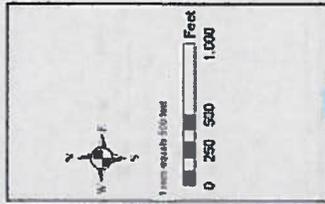
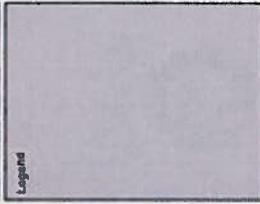
**Sarasota Bay Estuary
Program
Outfall Prioritization
Project**
Top 25 Ranked Outfalls
Shown on the map
Outfall ID: 03

Legend



**Sarasota Bay Estuary
Program
Outfall Prioritization
Project**

Top 25 Ranked Outfalls
Shown on the map
Outfall(s) 12



Sarasota Bay Estuary Program
Outfall Prioritization Project

Top 25 Ranked Outfalls
 Shows on this map
 Outfall(s) 11

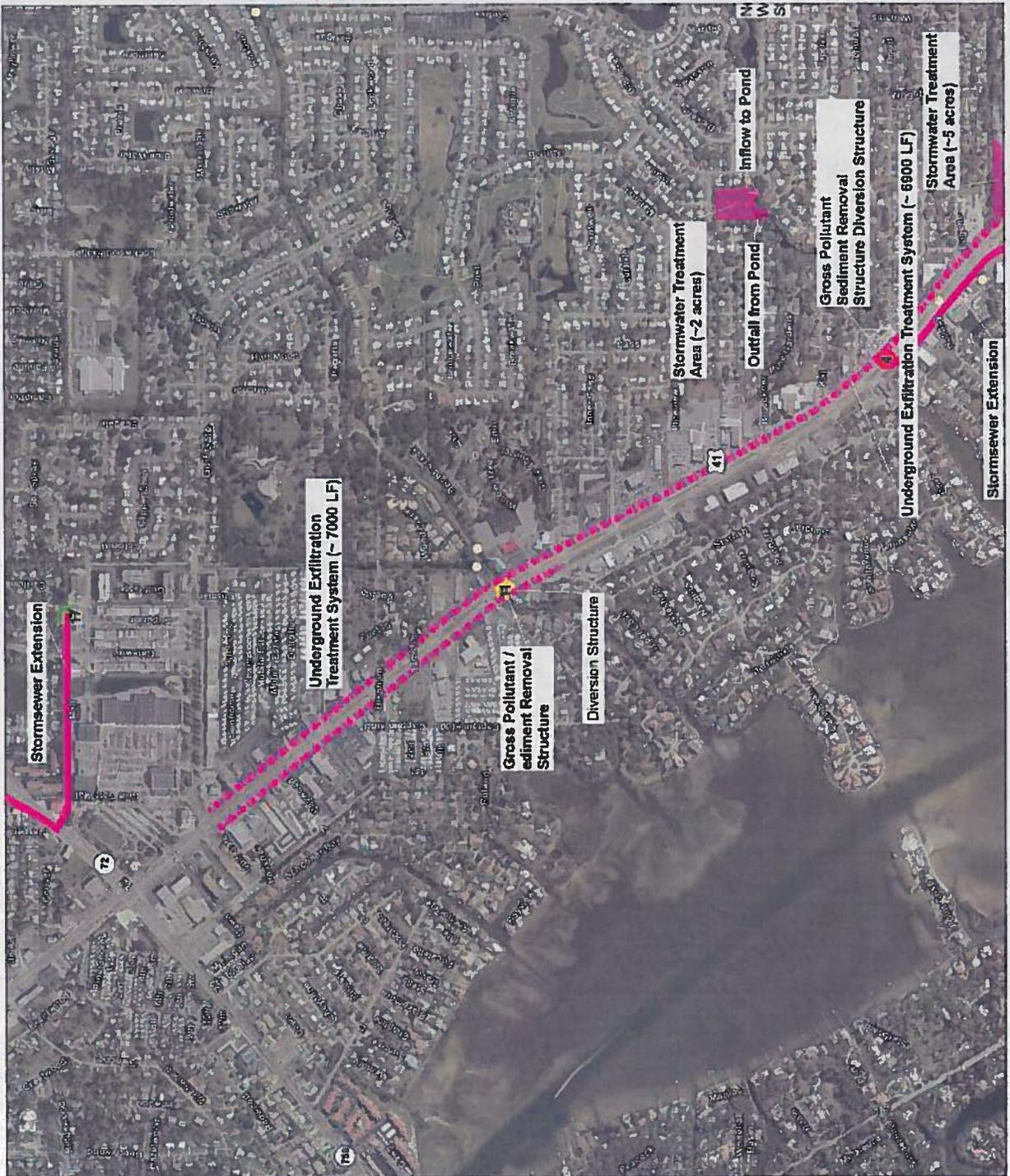
Legend

- Florida Bay Area
- High Priority / Stormwater Removal by 2020
- Medium Priority / Stormwater Removal by 2025
- Low Priority / Stormwater Removal by 2030
- Stormwater Treatment Area
- Diversion Structure
- Gross Pollutant / Sediment Removal Structure
- Undergrnd Exfiltration Treatment System
- Stormwater Treatment Area
- Stormwater Treatment Area

1 inch equals 500 feet

0 250 500 1,000 Feet

SARASOTA BAY ESTUARY PROGRAM
 Keeping Our Bays Healthy



Stormwater Extension

Underground Exfiltration Treatment System (~ 7000 LF)

Gross Pollutant / Sediment Removal Structure

Diversion Structure

Stormwater Treatment Area (~2 acres)

Outfall from Pond

Gross Pollutant / Sediment Removal Structure Diversion Structure

Underground Exfiltration Treatment System (~ 6900 LF)

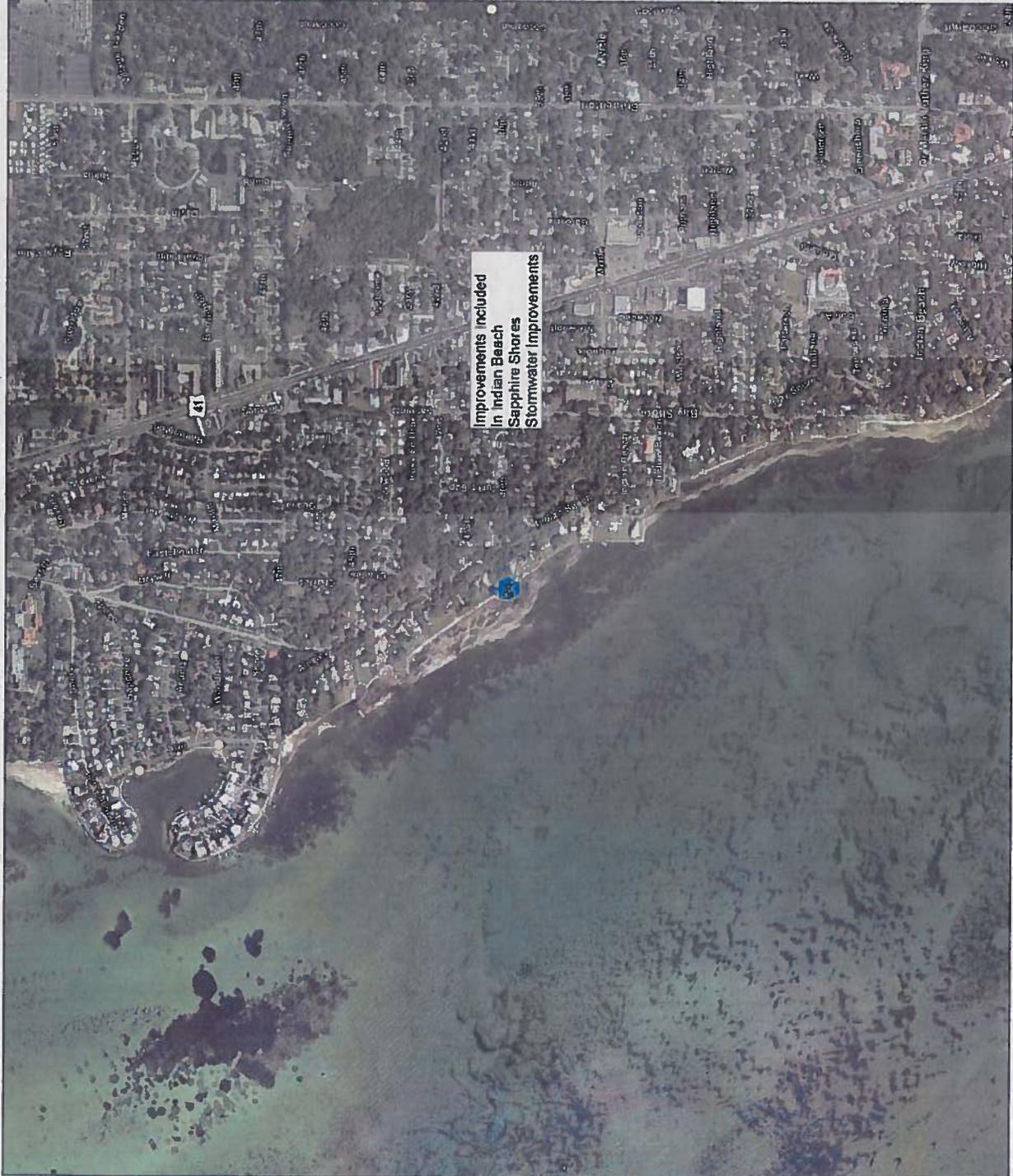
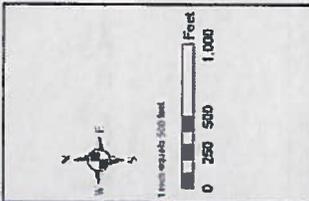
Stormwater Treatment Area (~5 acres)

Stormwater Extension

Sarasota Bay Estuary Program
Outfall Prioritization Project

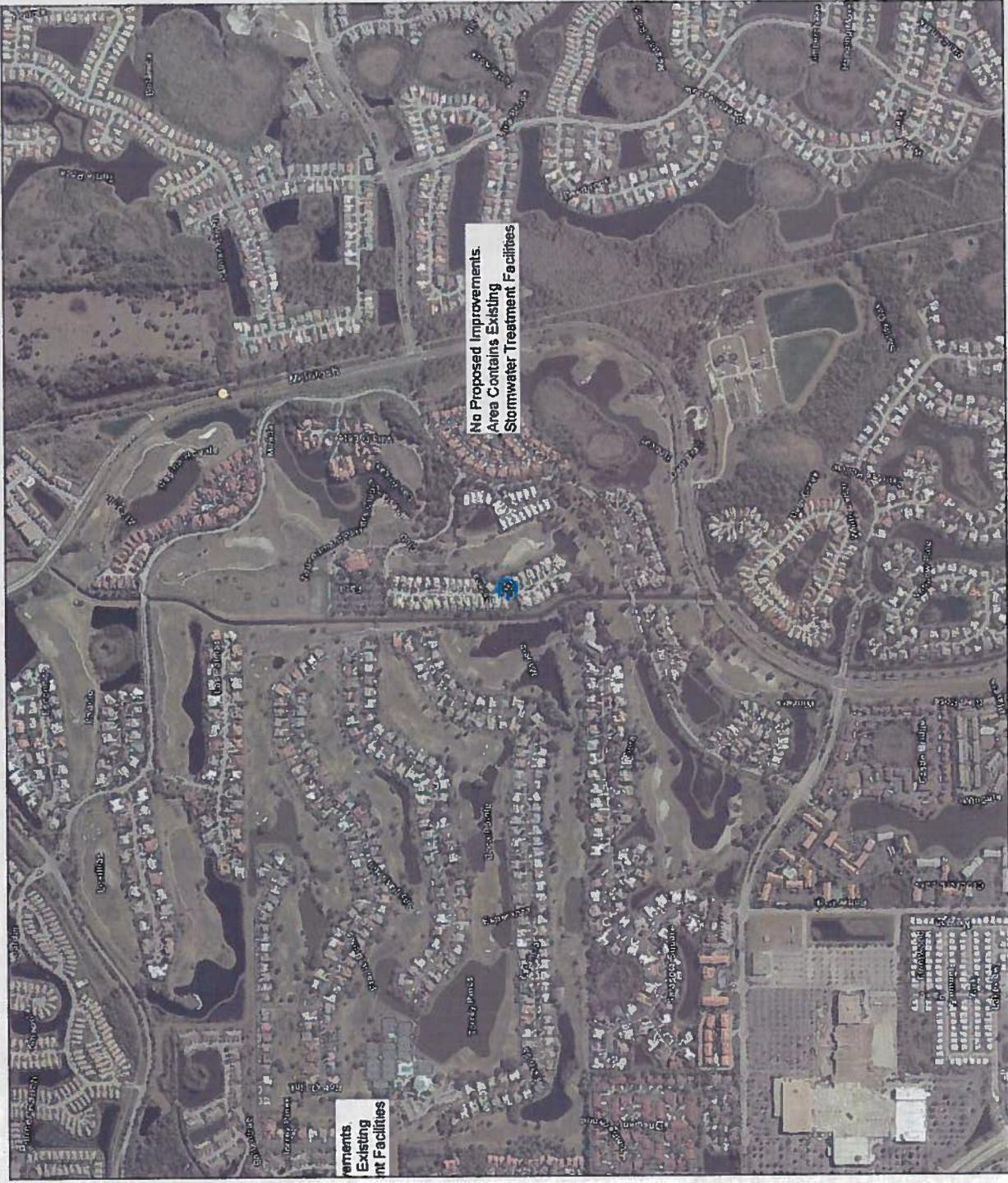
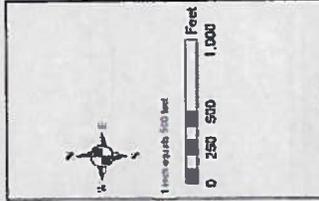
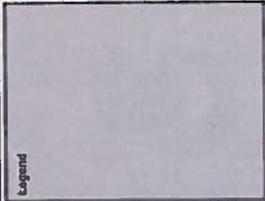
Top 25 Ranked Outfalls
 Shown on this map
 Outfalls: 24

- Legend**
- 1. Florida Bay Area
 - 2. Sarasota Bay Area
 - 3. Indian Beach
 - 4. Sapphire Shores
 - 5. Stormwater Improvements
 - 6. Other
 - 7. Other
 - 8. Other
 - 9. Other
 - 10. Other
 - 11. Other
 - 12. Other
 - 13. Other
 - 14. Other
 - 15. Other
 - 16. Other
 - 17. Other
 - 18. Other
 - 19. Other
 - 20. Other
 - 21. Other
 - 22. Other
 - 23. Other
 - 24. Other



Improvements included
 in Indian Beach
 Sapphire Shores
 Stormwater Improvements

Sarasota Bay Estuary Program
Outfall Prioritization Project
 Top 25 Ranked Outfalls
 Shown on this map
 Outfall(s) 27



**No Proposed Improvements.
 Area Contains Existing
 Stormwater Treatment Facilities**

**Improvements,
 Existing
 Treatment Facilities**