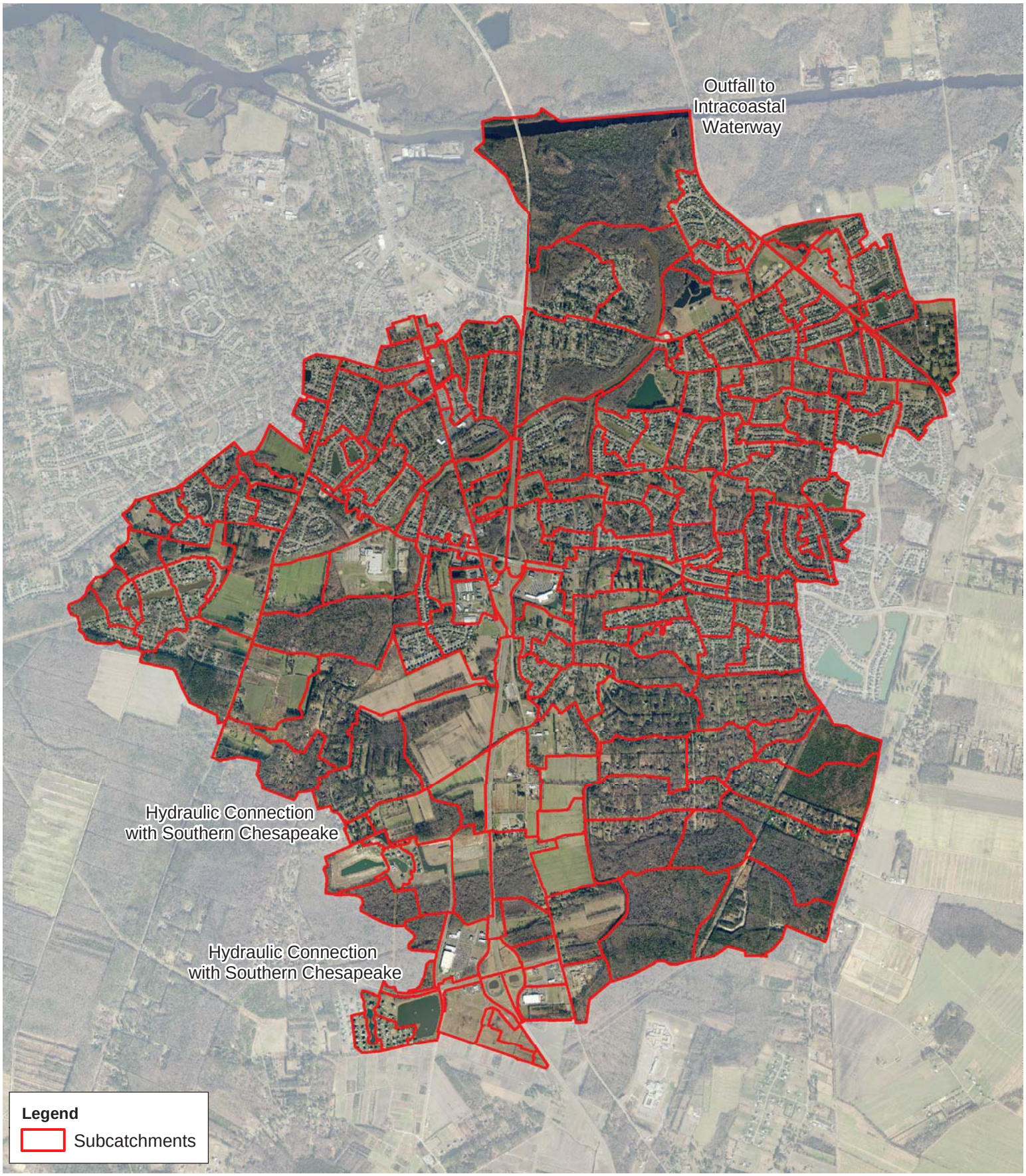


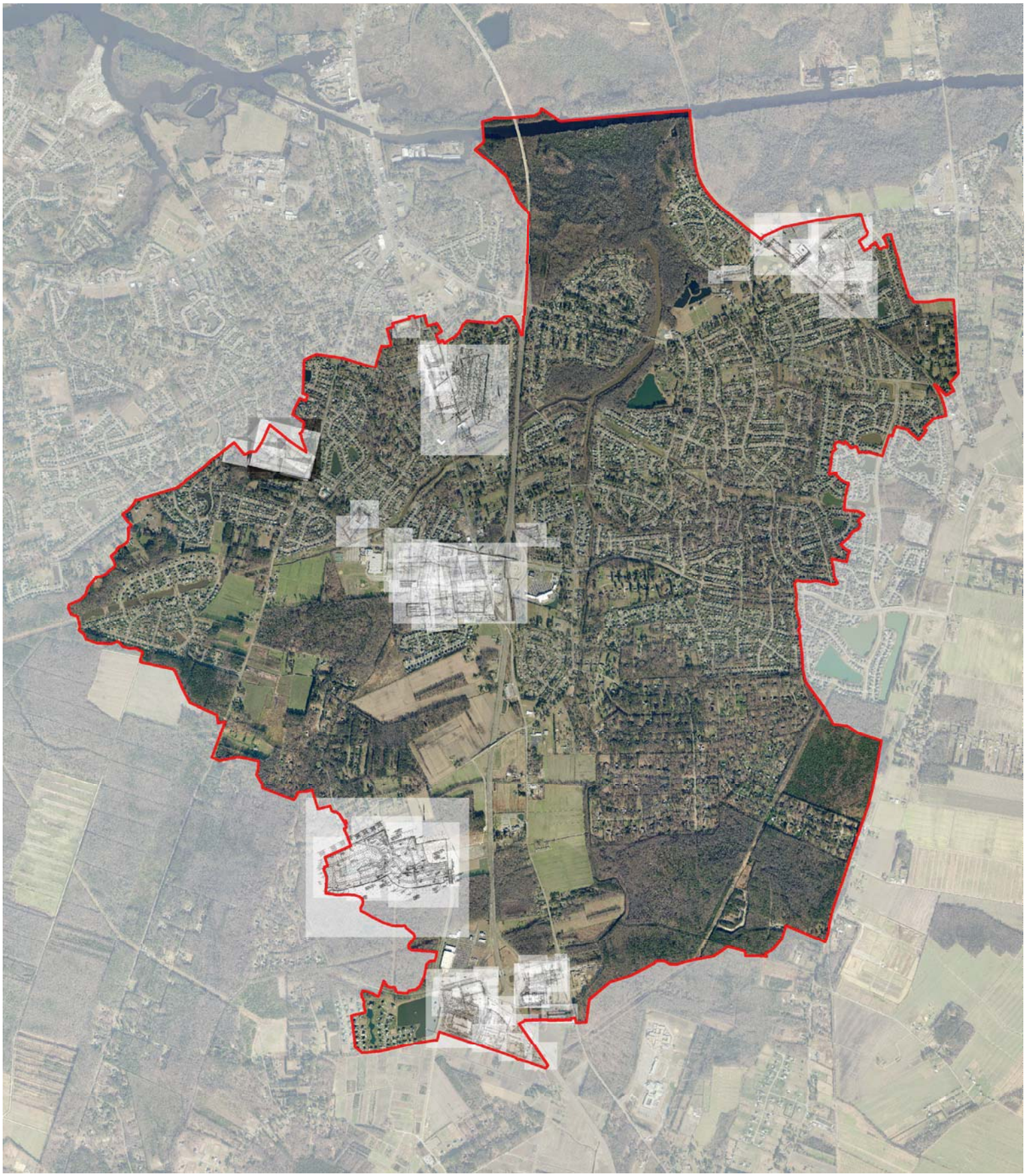
0 1,750 3,500 7,000 Feet

Aerial Imagery @ 2009 Commonwealth of Virginia.

N

See GIS for Complete Details

Figure 1. Cooper's Ditch Watershed Map



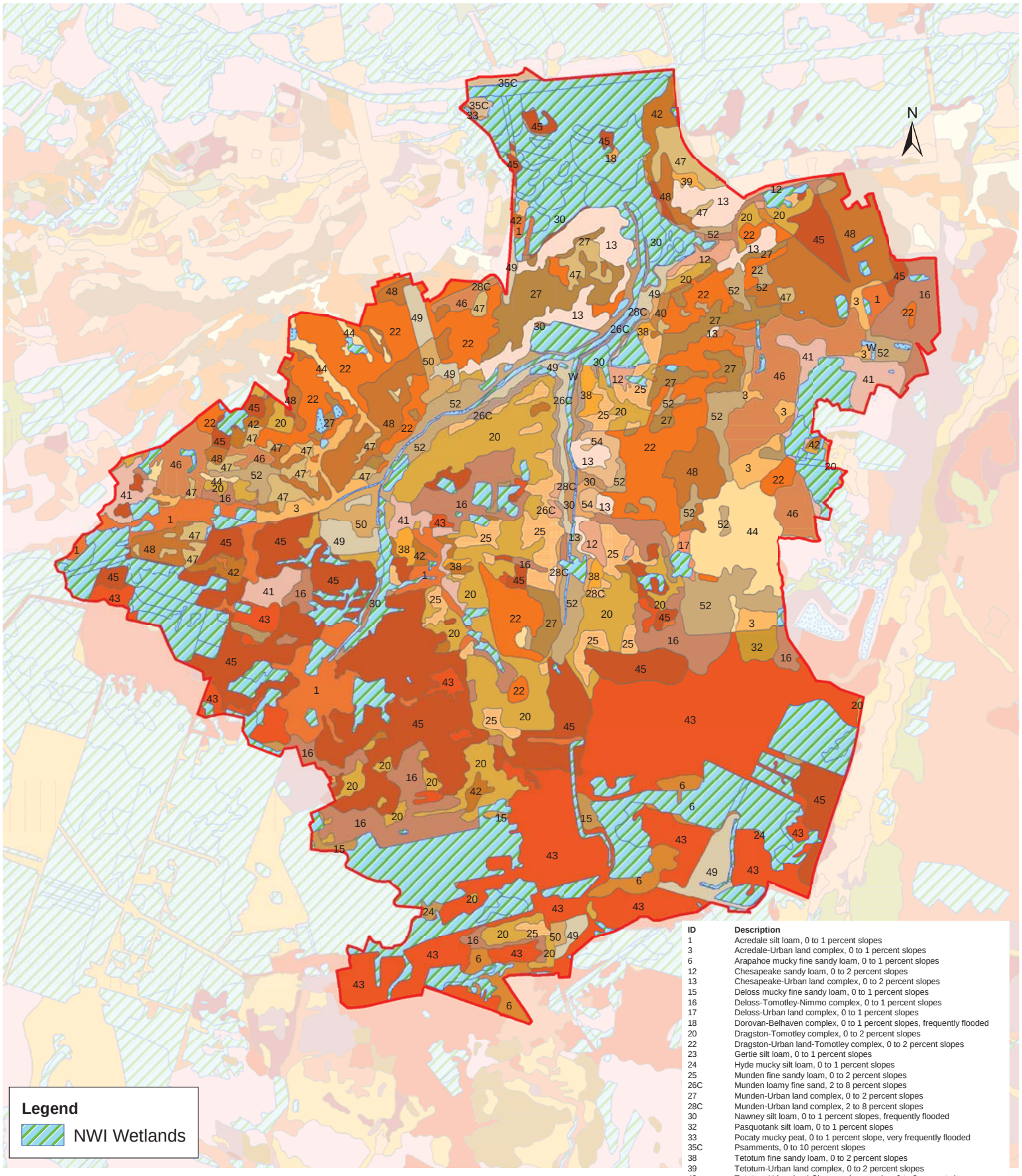
0 1,750 3,500 7,000 Feet

Aerial Imagery @ 2009 Commonwealth of Virginia.

See GIS for Complete Details

N

Figure 1a. Watershed Map with Newly Provided Plan Sets

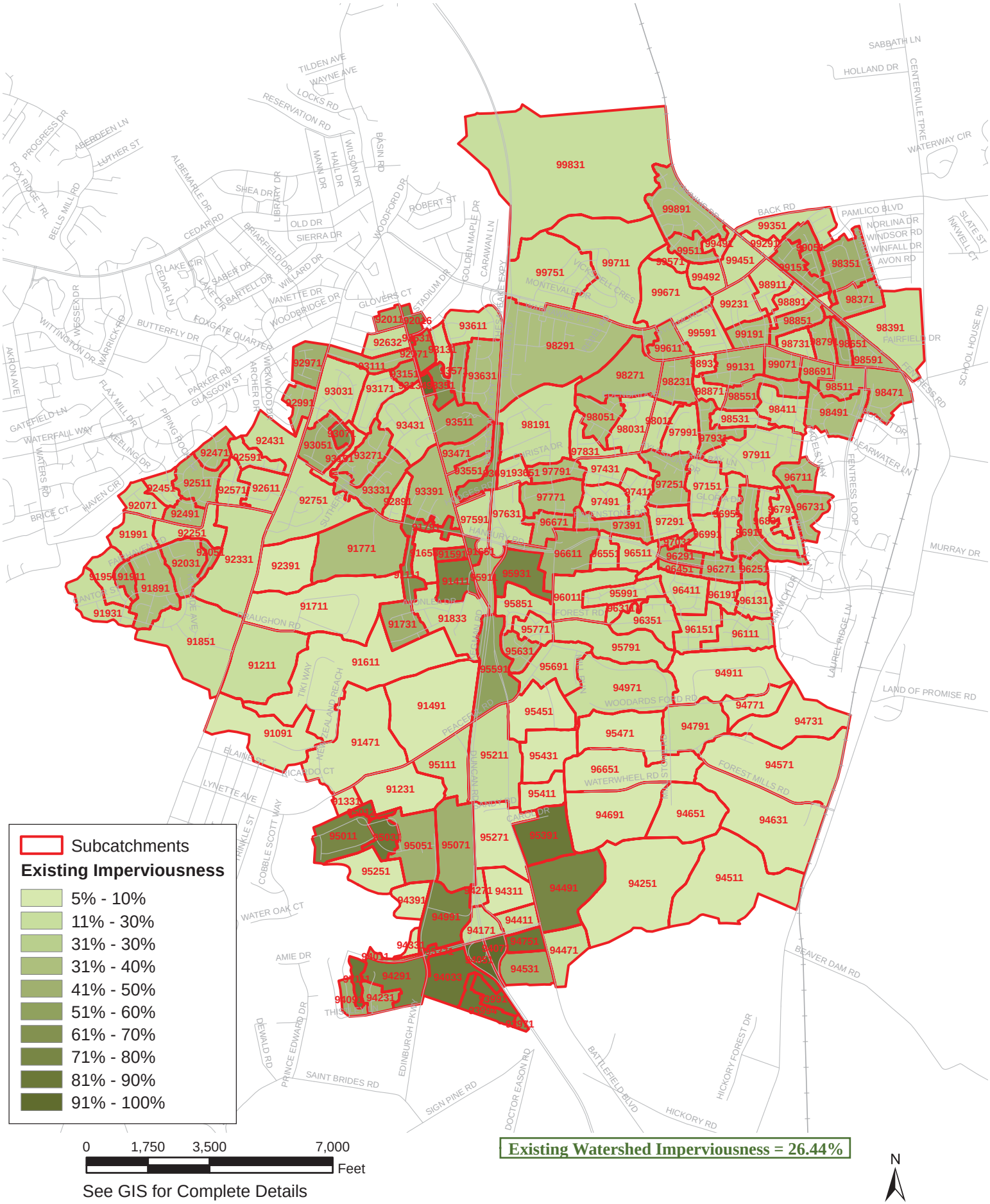


0 1,750 3,500 7,000 Feet

See GIS for Complete Details

ID	Description
1	Acredale silt loam, 0 to 1 percent slopes
3	Acredale-Urban land complex, 0 to 1 percent slopes
6	Arapahoe mucky fine sandy loam, 0 to 1 percent slopes
12	Chesapeake sandy loam, 0 to 2 percent slopes
13	Chesapeake-Urban land complex, 0 to 2 percent slopes
15	Deloss mucky fine sandy loam, 0 to 1 percent slopes
16	Deloss-Tomotley-Nimmo complex, 0 to 1 percent slopes
17	Deloss-Urban land complex, 0 to 1 percent slopes
18	Dorovan-Belhaven complex, 0 to 1 percent slopes, frequently flooded
20	Dragston-Tomotley complex, 0 to 2 percent slopes
22	Dragston-Urban land-Tomotley complex, 0 to 2 percent slopes
23	Gertie silt loam, 0 to 1 percent slopes
24	Hyde mucky silt loam, 0 to 1 percent slopes
25	Munden fine sandy loam, 0 to 2 percent slopes
26C	Munden loamy fine sand, 2 to 8 percent slopes
27	Munden-Urban land complex, 0 to 2 percent slopes
28C	Munden-Urban land complex, 2 to 8 percent slopes
30	Nawney silt loam, 0 to 1 percent slopes, frequently flooded
32	Pasquotank silt loam, 0 to 1 percent slopes
33	Pocaty mucky peat, 0 to 1 percent slope, very frequently flooded
35C	Psamments, 0 to 10 percent slopes
38	Tetotum fine sandy loam, 0 to 2 percent slopes
39	Tetotum-Urban land complex, 0 to 2 percent slopes
40	Tetotum-Urban land-Chesapeake complex, 0 to 2 percent slopes
41	Tomotley fine sandy loam, 0 to 1 percent slopes
42	Tomotley-Bertie complex, 0 to 2 percent slopes
43	Tomotley-Deloss complex, 0 to 1 percent slopes
44	Tomotley-Deloss-Urban land complex, 0 to 1 percent slopes
45	Tomotley-Nimmo complex, 0 to 1 percent slopes
46	Tomotley-Urban land complex, 0 to 1 percent slopes
47	Tomotley-Urban land-Bertie complex, 0 to 2 percent slopes
48	Tomotley-Urban land-Nimmo complex, 0 to 1 percent slopes
49	Udorthents-Urban land complex, 0 to 45 percent slopes
50	Urban land, 0 to 5 percent slopes
52	Urban land-Deloss-Tomotley-Nimmo complex, 0 to 1 percent slopes
54	Weeksville mucky silt loam, 0 to 1 percent slopes
W	Water

Figure 2. Soils with Wetlands Overlay



See GIS for Complete Details

Figure 3. Existing Conditions Subcatchments with Shaded Imperviousness

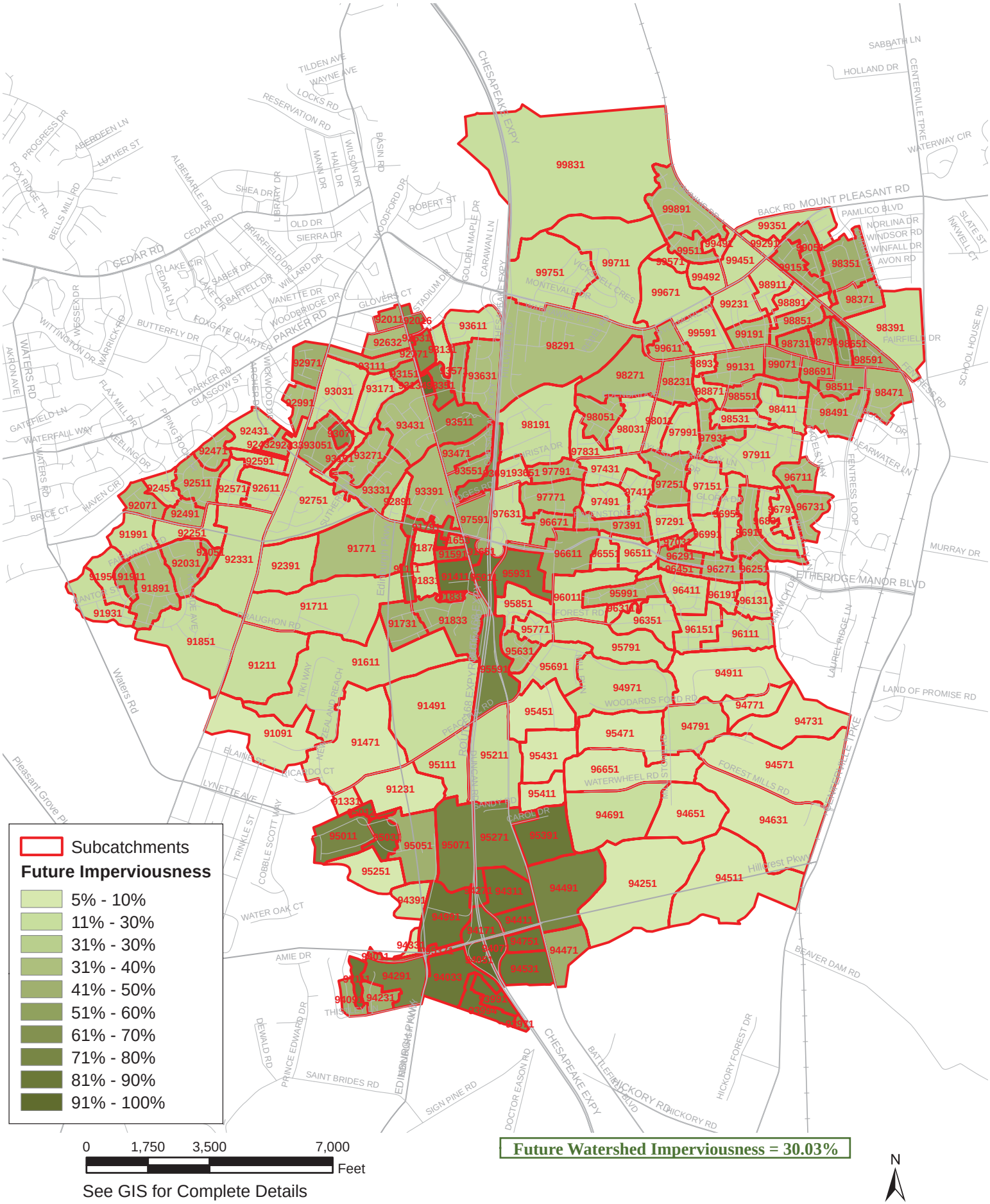
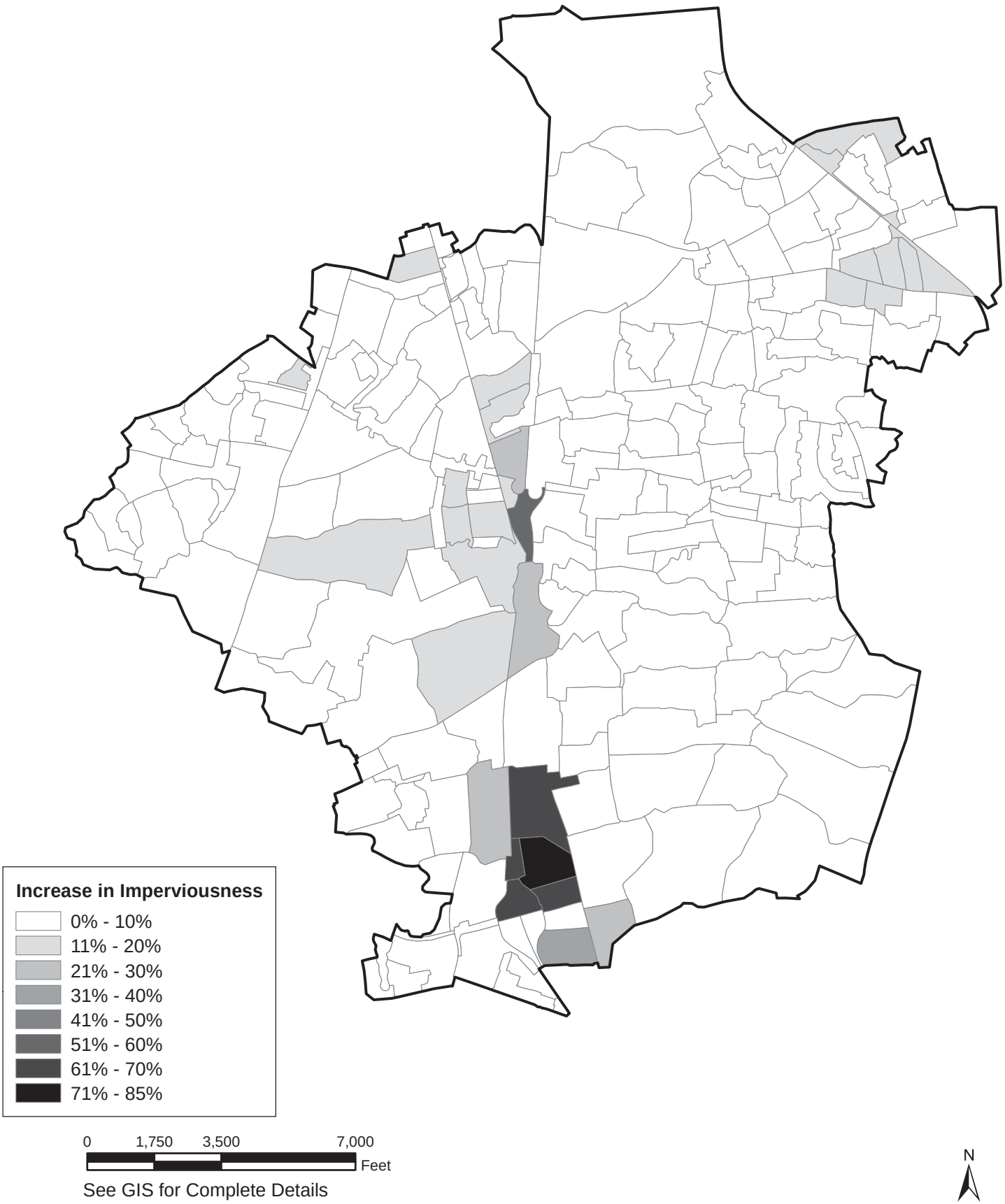
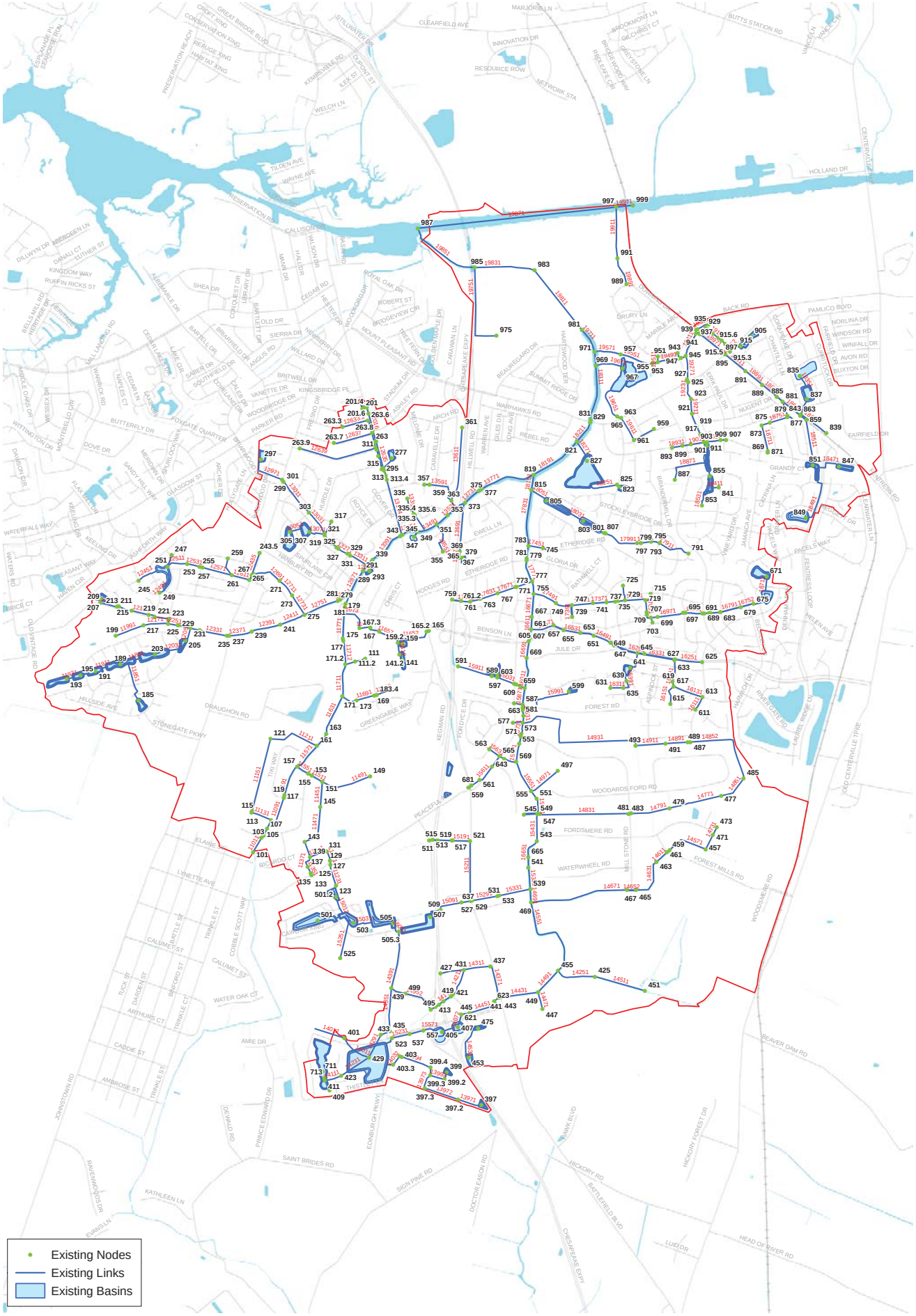


Figure 4. Future Conditions Subcatchments with Shaded Imperviousness



See GIS for Complete Details

Figure 5. Subcatchments with Potential Increase in Imperviousness



0 1,250 2,500 5,000 Feet

See GIS for Complete Details

N

Figure 6. Link-Node Diagram - Existing Conditions

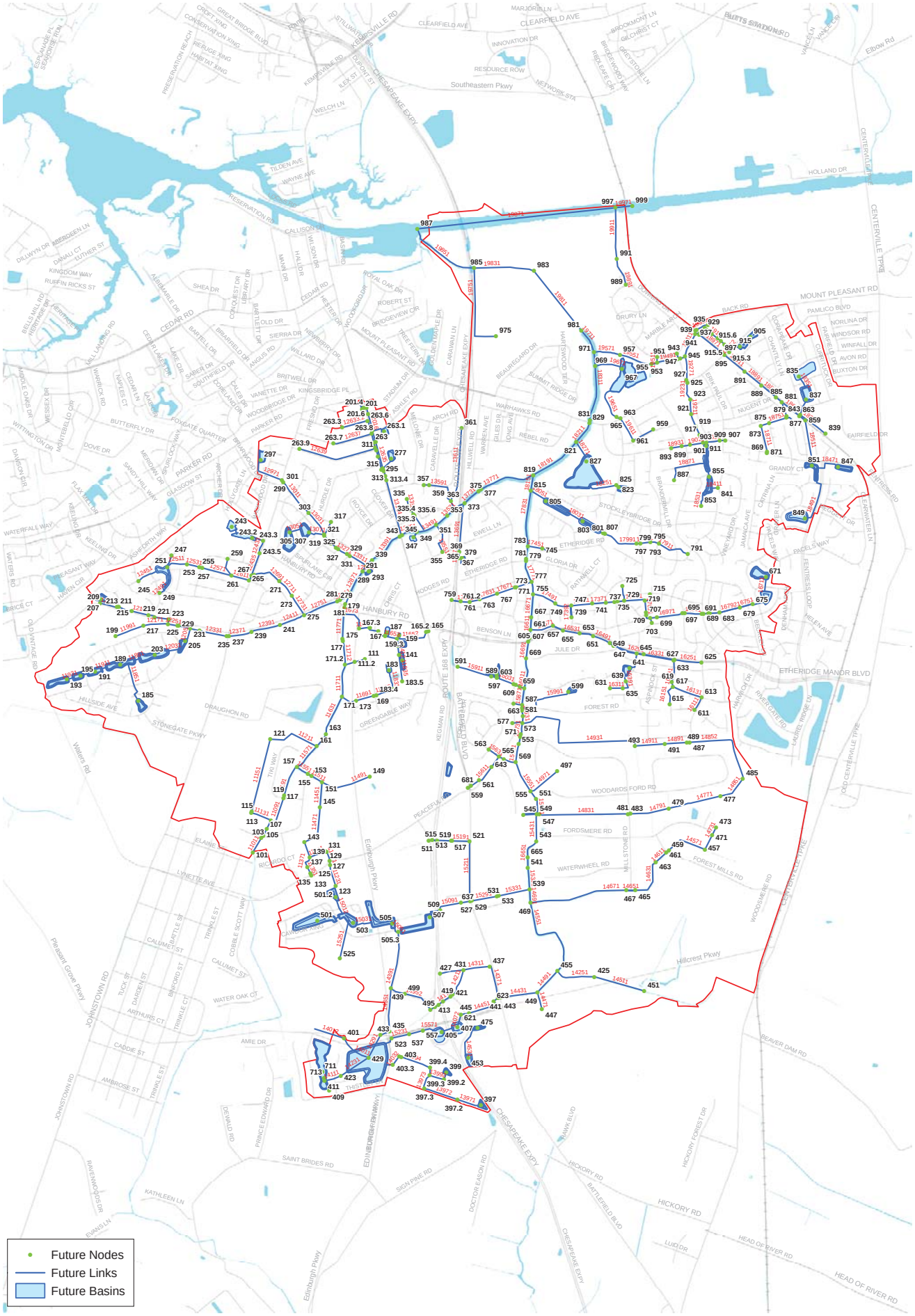
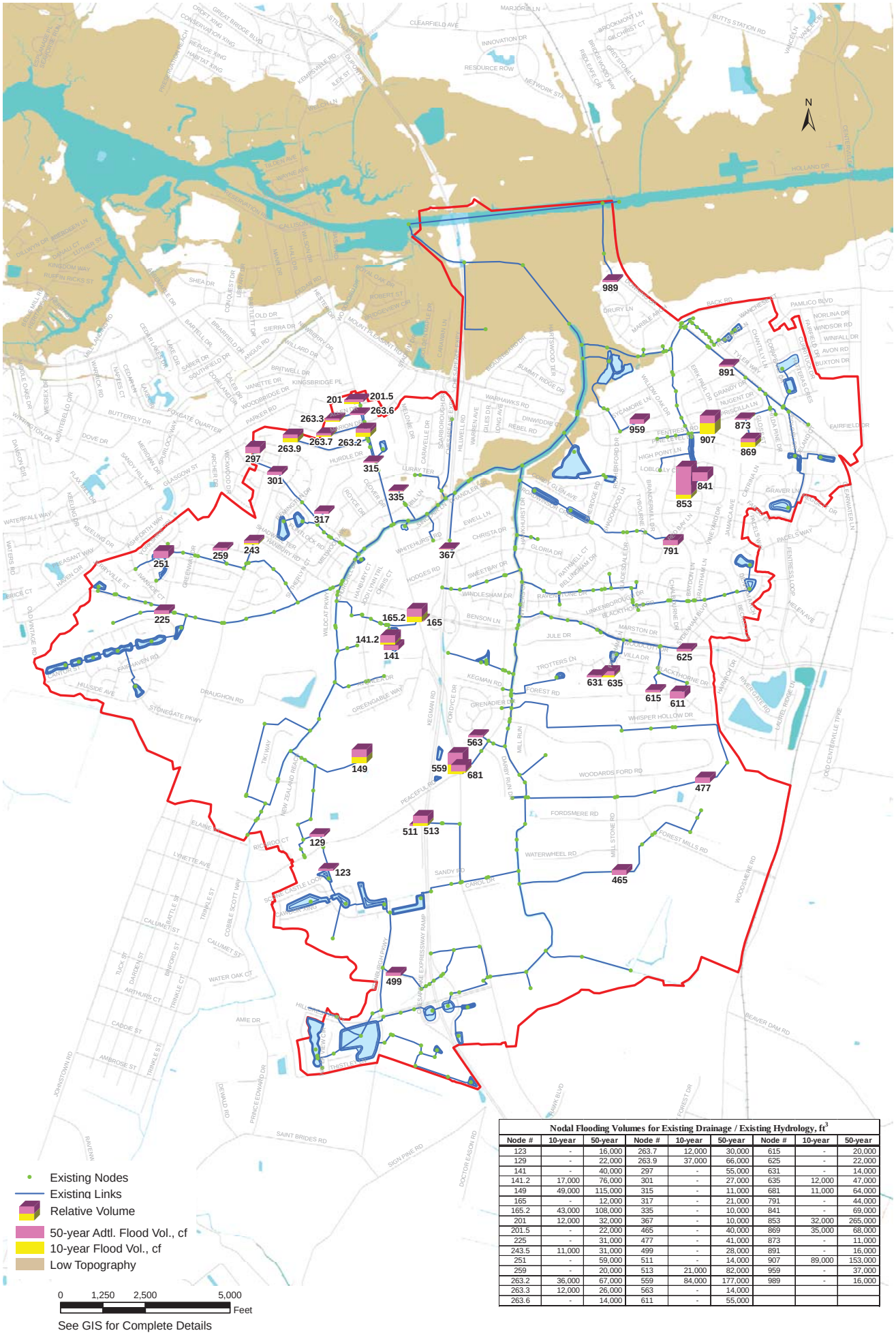
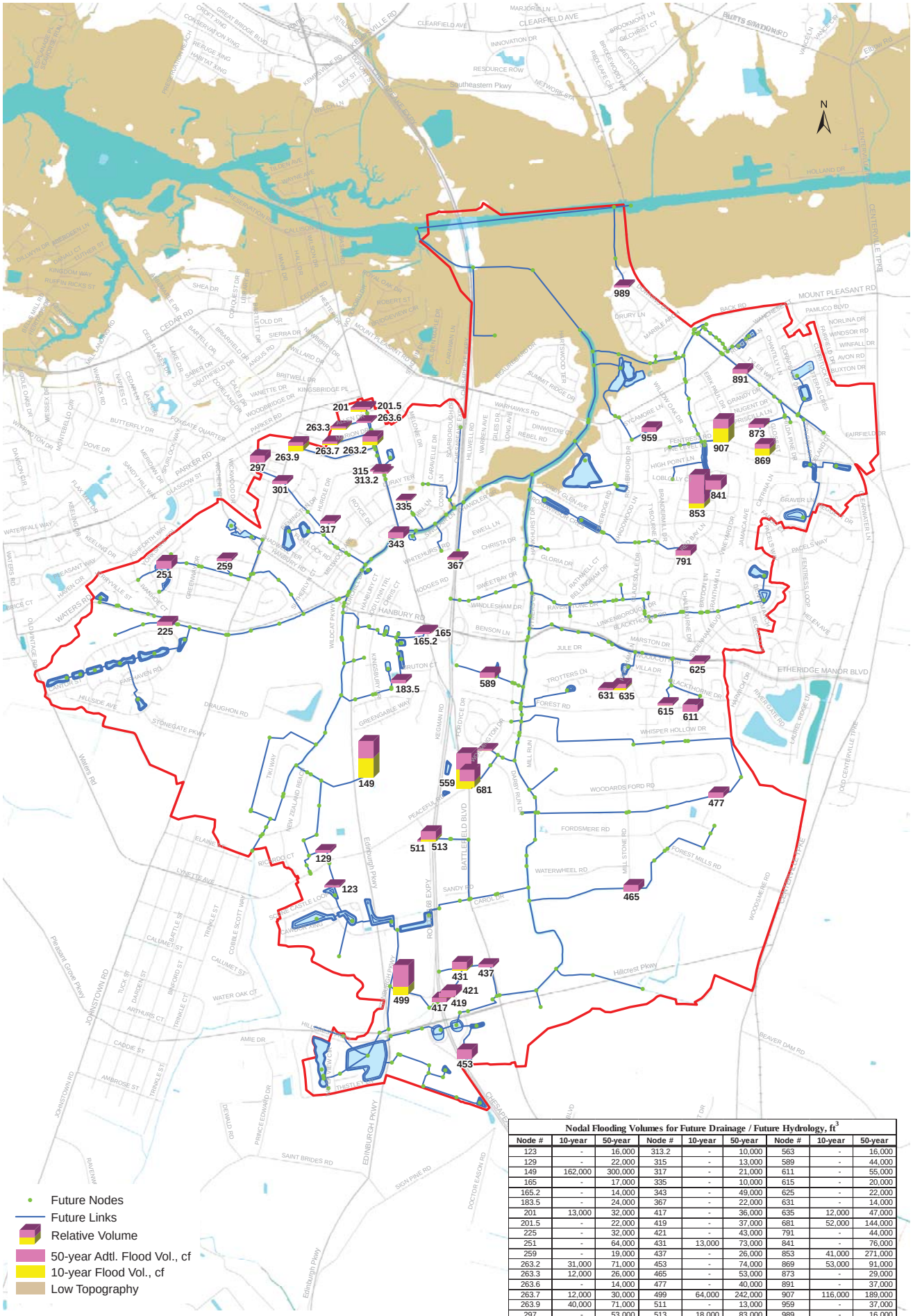


Figure 7. Link-Node Diagram - Future Conditions



Nodal Flooding Volumes for Existing Drainage / Existing Hydrology, ft^3								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	-	16,000	263.7	12,000	30,000	615	-	20,000
129	-	22,000	263.9	37,000	66,000	625	-	22,000
141	-	40,000	297	-	55,000	631	-	14,000
141.2	17,000	76,000	301	-	27,000	635	12,000	47,000
149	49,000	115,000	315	-	11,000	681	11,000	64,000
165	-	12,000	317	-	21,000	791	-	44,000
165.2	43,000	108,000	335	-	10,000	841	-	69,000
201	12,000	32,000	367	-	10,000	853	32,000	265,000
201.5	-	22,000	465	-	40,000	869	35,000	68,000
225	-	31,000	477	-	41,000	873	-	11,000
243.5	11,000	31,000	499	-	28,000	891	-	16,000
251	-	59,000	511	-	14,000	907	89,000	153,000
259	-	20,000	513	21,000	82,000	959	-	37,000
263.2	36,000	67,000	559	84,000	177,000	989	-	16,000
263.3	12,000	26,000	563	-	14,000			
263.6	-	14,000	611	-	55,000			

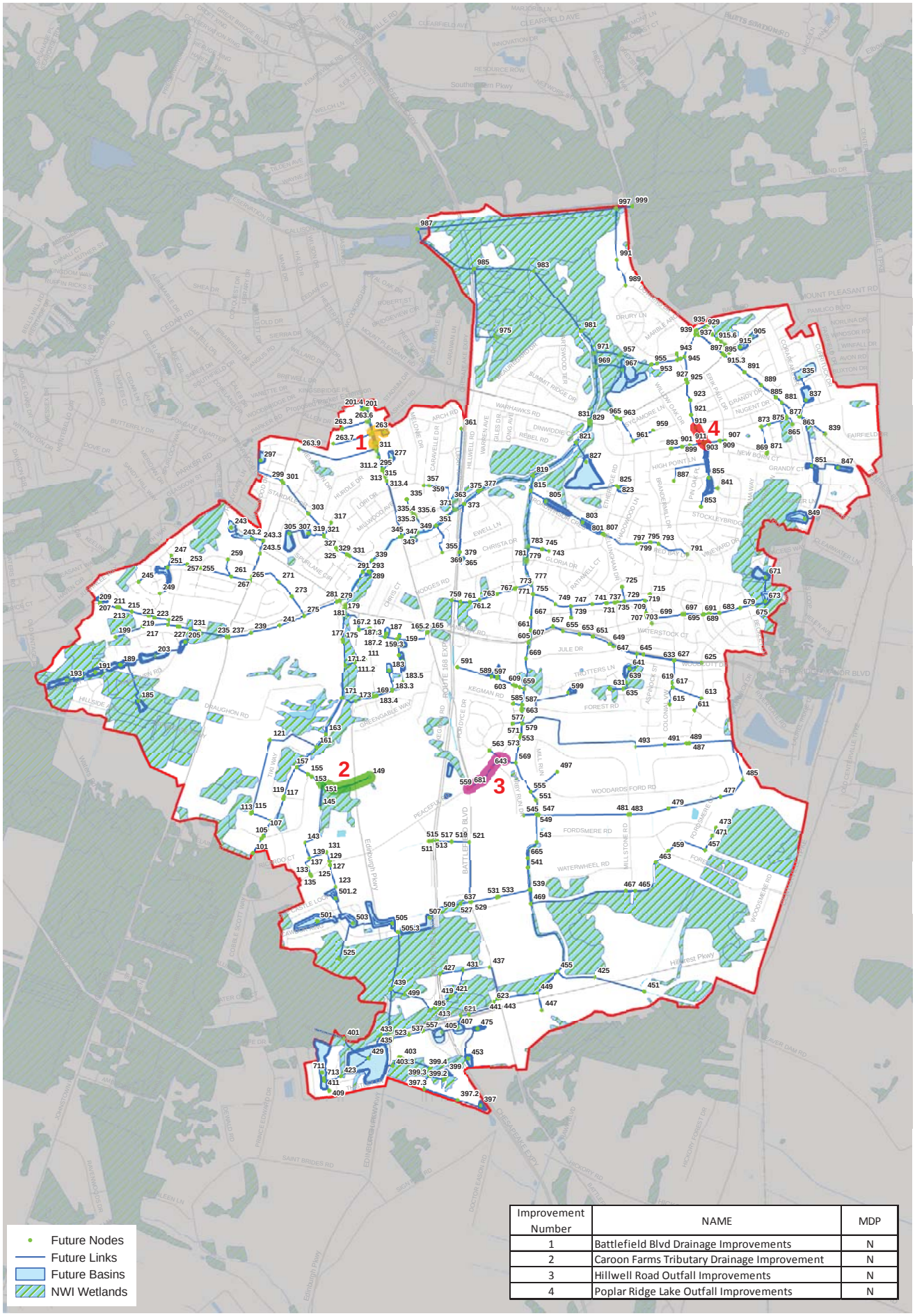
Figure 8. Flooding for 10-Yr and 50-Yr Storms: Existing Hydrology, Existing Drainage (Scenario 1)



See GIS for Complete Details

Nodal Flooding Volumes for Future Drainage / Future Hydrology, ft^3								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	-	16,000	313.2	-	10,000	563	-	16,000
129	-	22,000	315	-	13,000	589	-	44,000
149	162,000	300,000	317	-	21,000	611	-	55,000
165	-	17,000	335	-	10,000	615	-	20,000
165.2	-	14,000	343	-	49,000	625	-	22,000
183.5	-	24,000	367	-	22,000	631	-	14,000
201	13,000	32,000	417	-	36,000	635	12,000	47,000
201.5	-	22,000	419	-	37,000	681	52,000	144,000
225	-	32,000	421	-	43,000	791	-	44,000
251	-	64,000	431	13,000	73,000	841	-	76,000
259	-	19,000	437	-	26,000	853	41,000	271,000
263.2	31,000	71,000	453	-	74,000	869	53,000	91,000
263.3	12,000	26,000	465	-	53,000	873	-	29,000
263.6	-	14,000	477	-	40,000	891	-	37,000
263.7	12,000	30,000	499	64,000	242,000	907	116,000	189,000
263.9	40,000	71,000	511	-	13,000	959	-	37,000
297	-	53,000	513	18,000	83,000	989	-	16,000
301	-	25,000	559	162,000	291,000			

Figure 9. Flooding for 10-Yr and 50-Yr Storms: Future Hydrology, Future Drainage Without Improvements (Scenario 2)



Improvement Number	NAME	MDP
1	Battlefield Blvd Drainage Improvements	N
2	Caroon Farms Tributary Drainage Improvement	N
3	Hillwell Road Outfall Improvements	N
4	Poplar Ridge Lake Outfall Improvements	N

0 1,250 2,500 5,000 Feet

See GIS for Complete Details

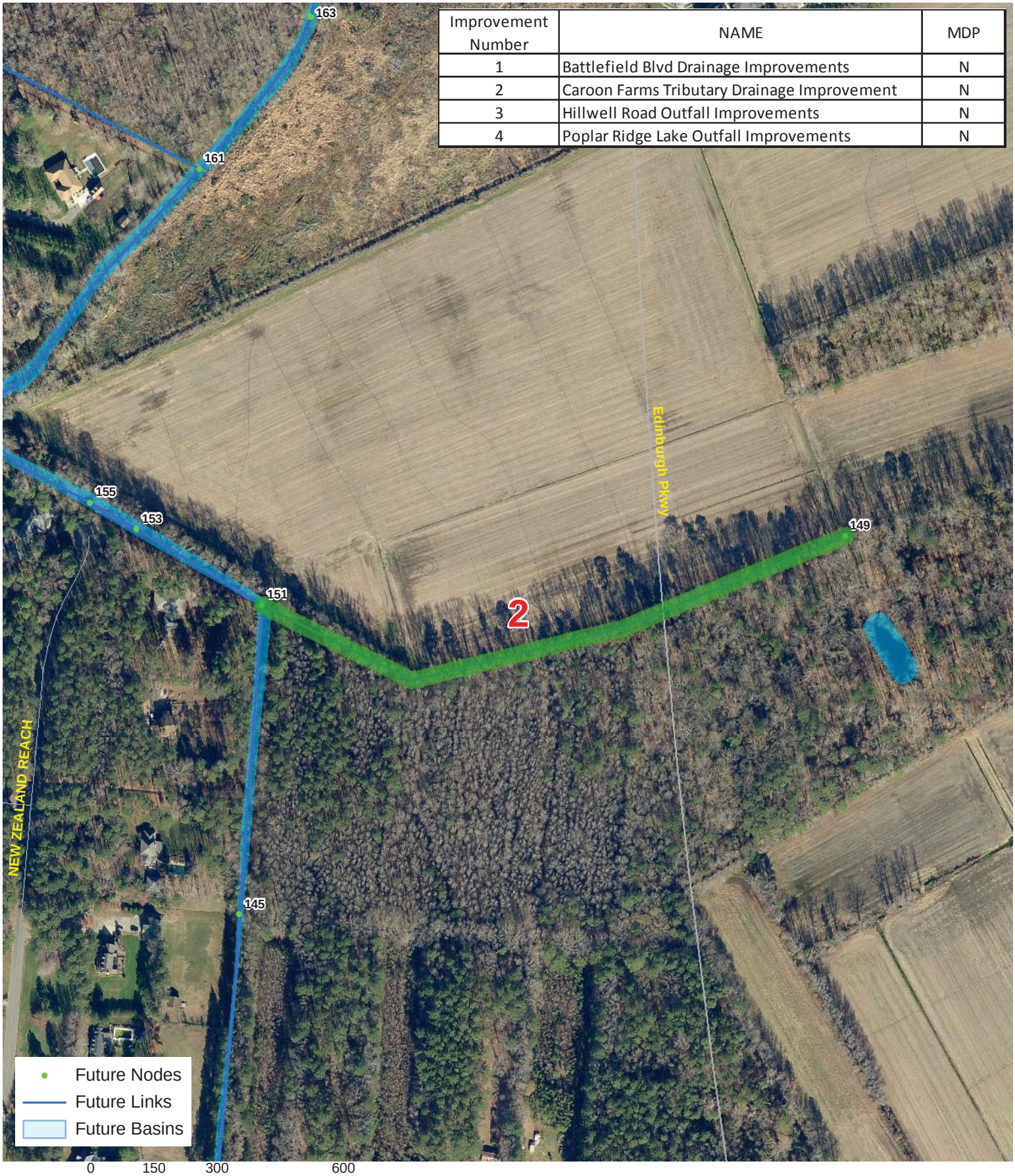
N

Figure 10. Future Improvements with Wetlands Underlay.

Improvement Number	NAME	MDP
1	Battlefield Blvd Drainage Improvements	N
2	Caroon Farms Tributary Drainage Improvement	N
3	Hillwell Road Outfall Improvements	N
4	Poplar Ridge Lake Outfall Improvements	N

See GIS for Complete Details

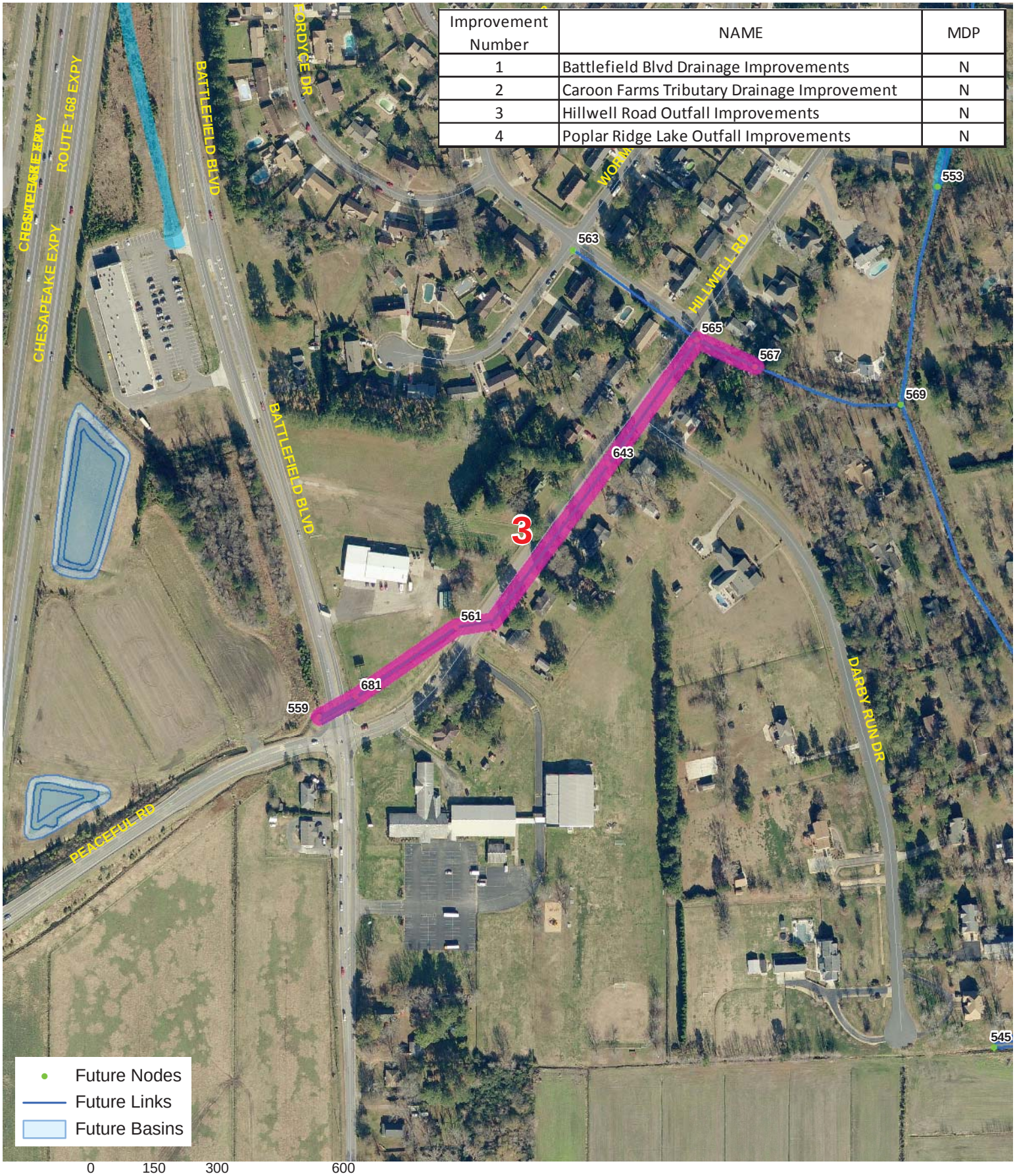
Figure 10a. Future Improvements (Close-up)



Improvement Number	NAME	MDP
1	Battlefield Blvd Drainage Improvements	N
2	Caroon Farms Tributary Drainage Improvement	N
3	Hillwell Road Outfall Improvements	N
4	Poplar Ridge Lake Outfall Improvements	N

See GIS for Complete Details

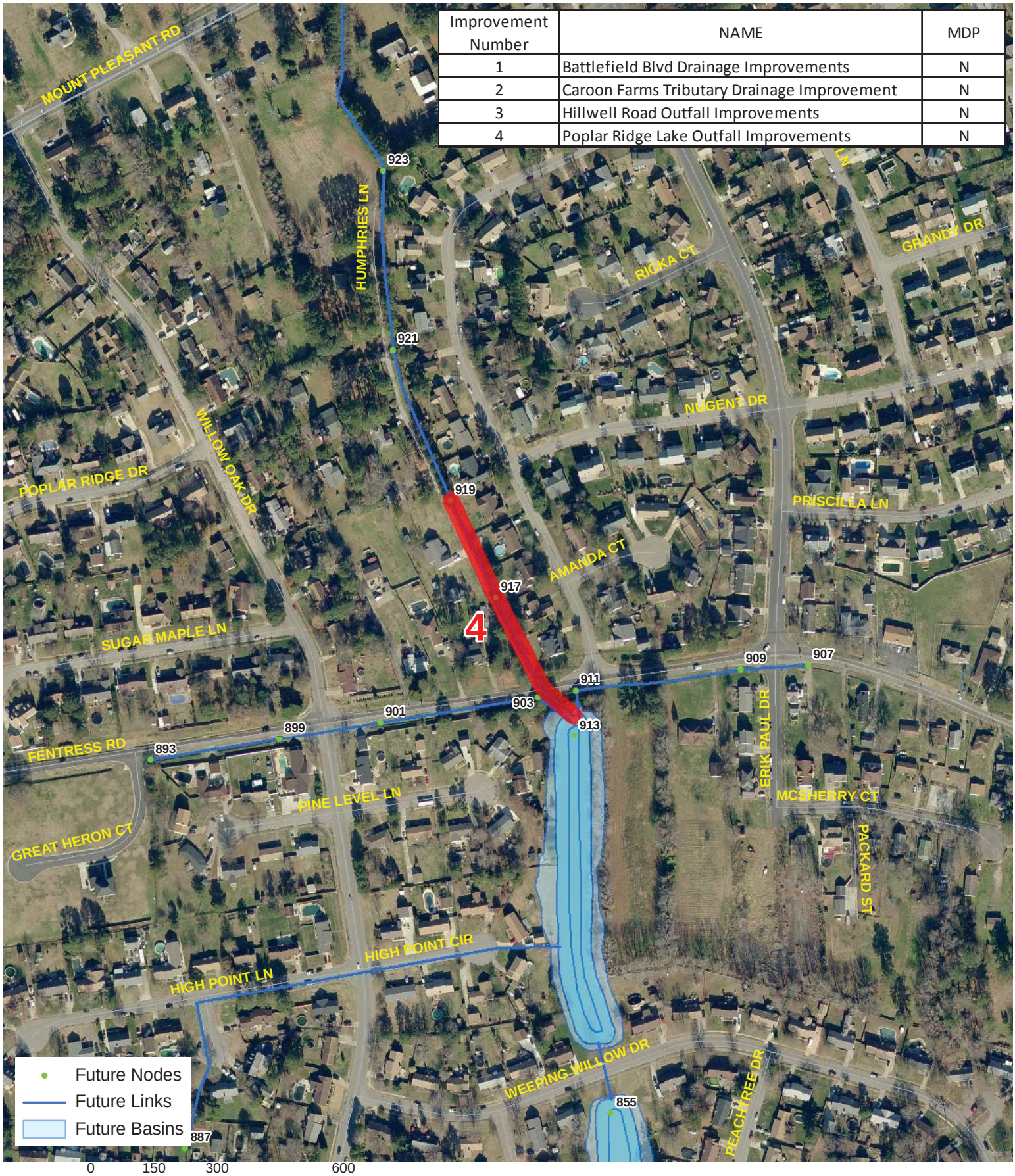
Figure 10b. Future Improvements (Close-up)



Improvement Number	NAME	MDP
1	Battlefield Blvd Drainage Improvements	N
2	Caroon Farms Tributary Drainage Improvement	N
3	Hillwell Road Outfall Improvements	N
4	Poplar Ridge Lake Outfall Improvements	N

See GIS for Complete Details

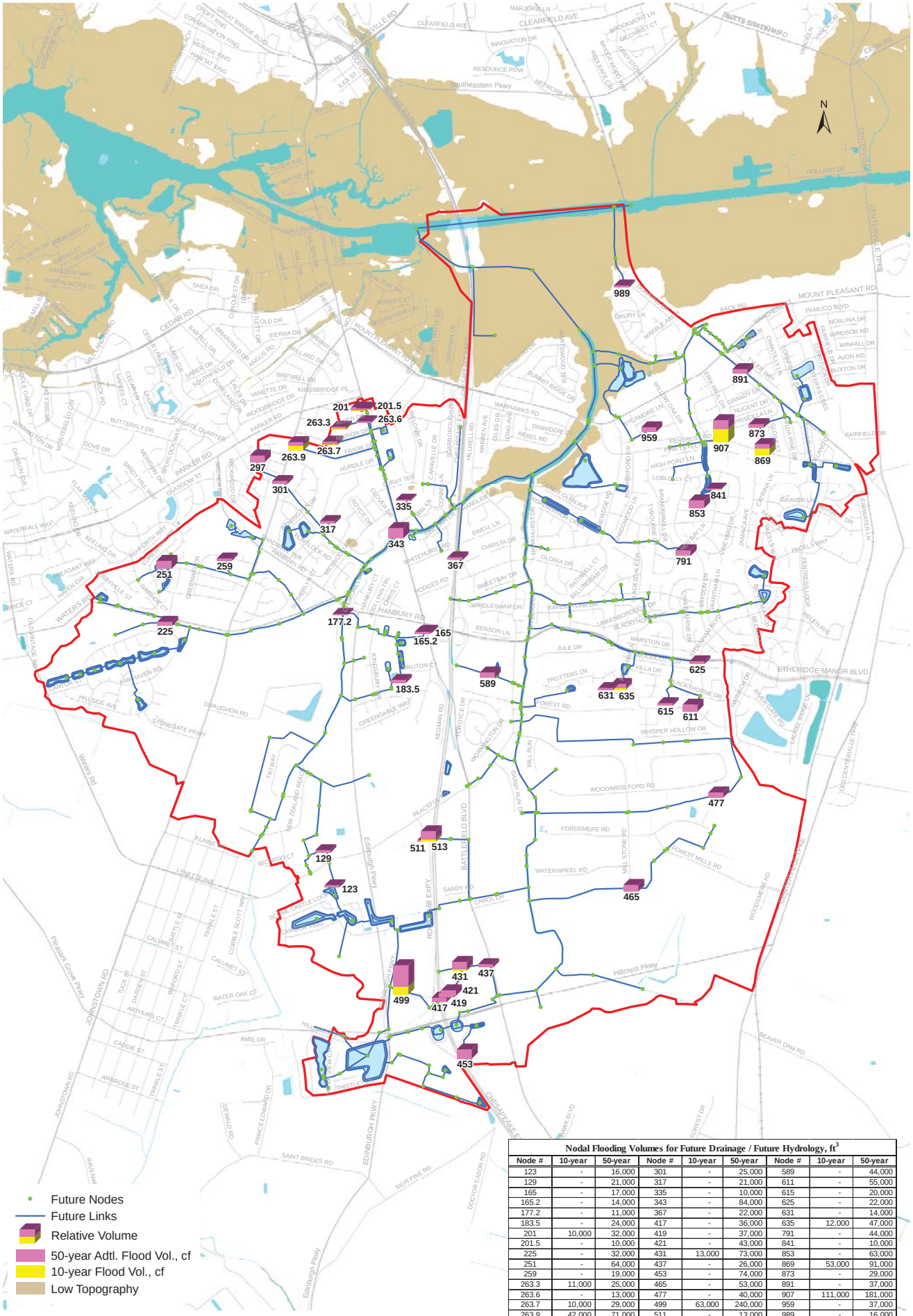
Figure 10c. Future Improvements (Close-up)



Improvement Number	NAME	MDP
1	Battlefield Blvd Drainage Improvements	N
2	Caroon Farms Tributary Drainage Improvement	N
3	Hillwell Road Outfall Improvements	N
4	Poplar Ridge Lake Outfall Improvements	N

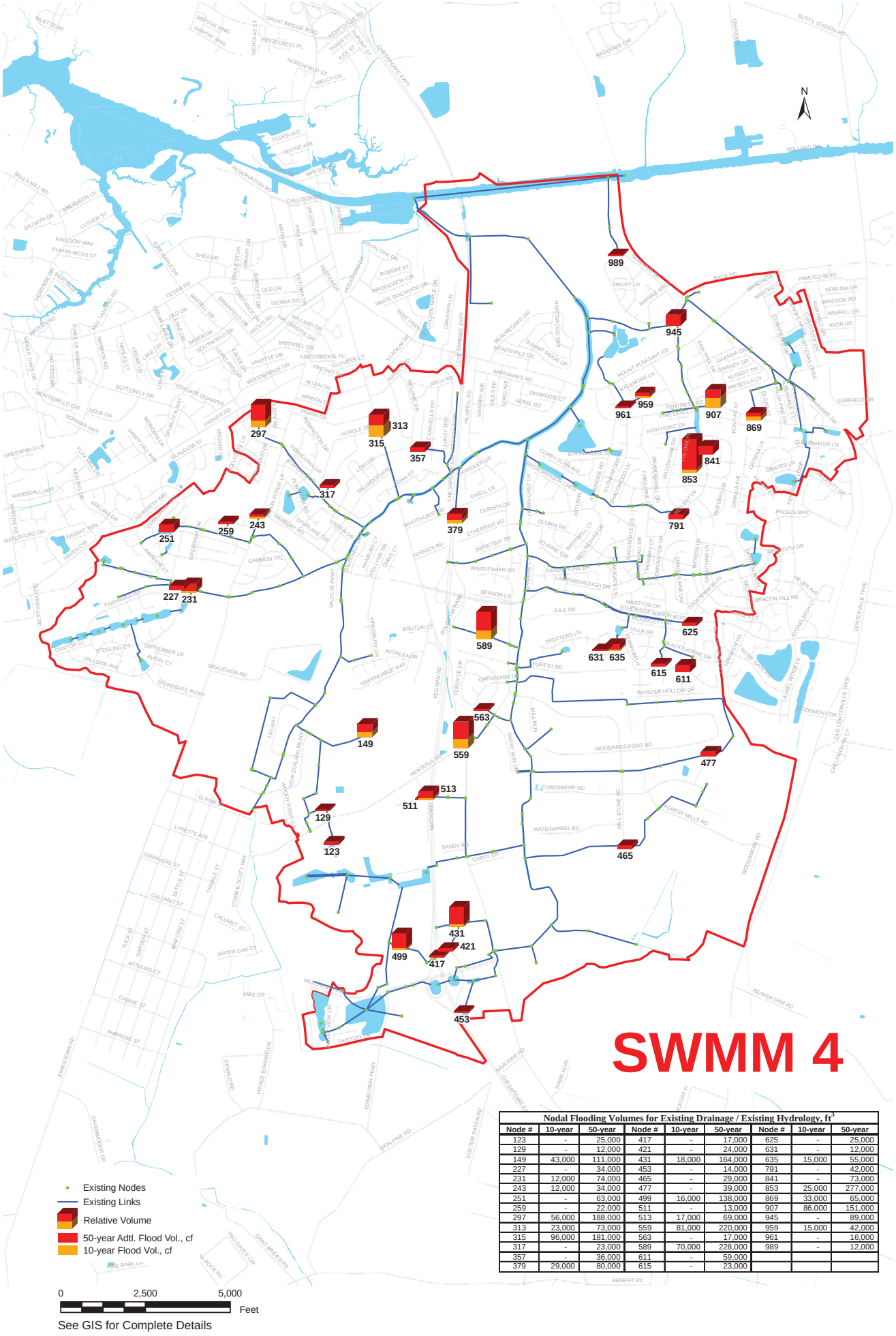
See GIS for Complete Details

Figure 10d. Future Improvements (Close-up)



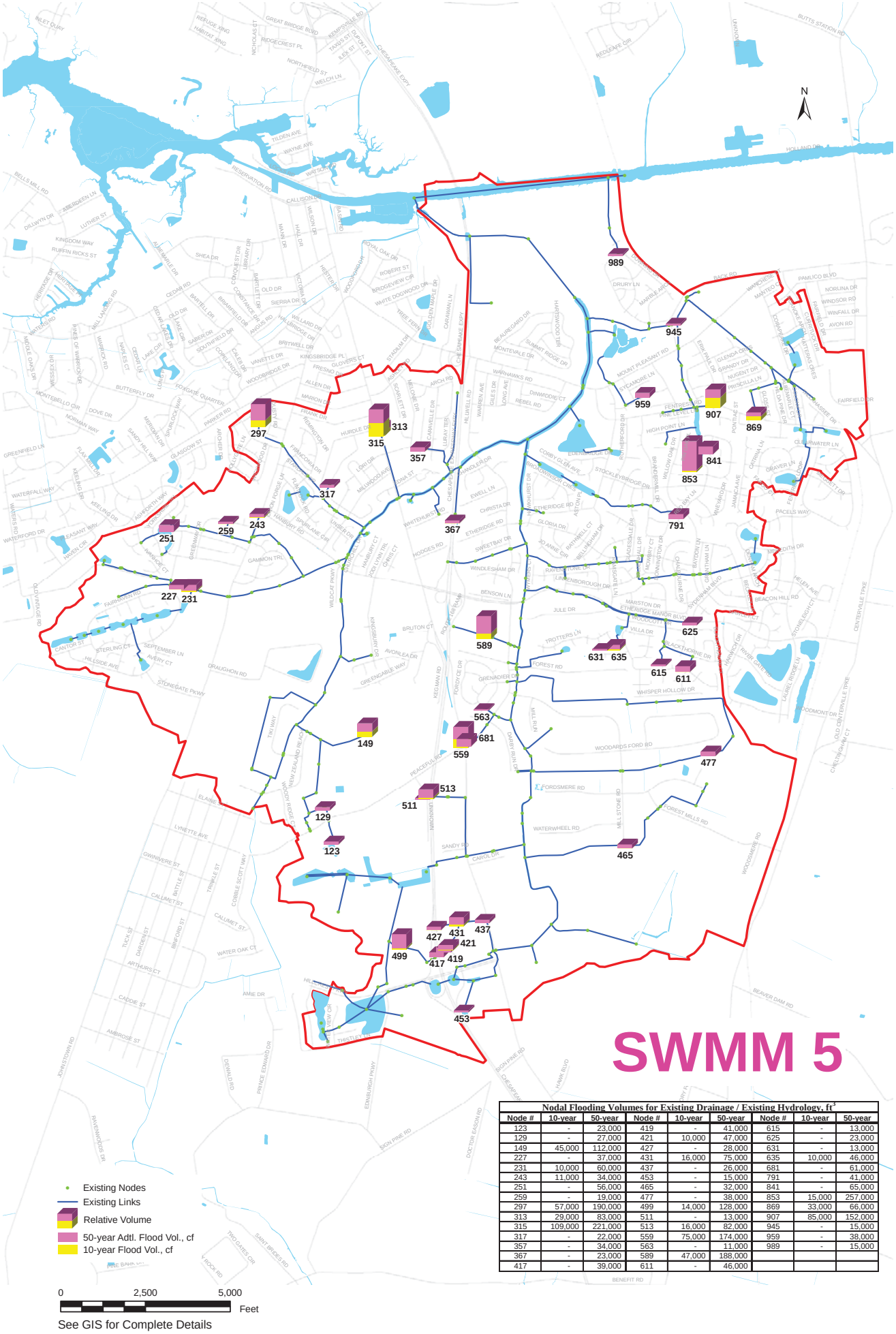
Nodal Flooding Volumes for Future Drainage / Future Hydrology, ft^3								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	-	16,000	301	-	25,000	589	-	44,000
129	-	21,000	317	-	21,000	611	-	55,000
165	-	17,000	335	-	10,000	615	-	20,000
165.2	-	14,000	343	-	84,000	625	-	22,000
177.2	-	11,000	367	-	22,000	631	-	14,000
183.5	-	24,000	417	-	36,000	635	12,000	47,000
201	10,000	32,000	419	-	37,000	791	-	44,000
201.5	-	10,000	421	-	43,000	841	-	10,000
225	-	32,000	431	13,000	73,000	853	-	63,000
251	-	64,000	437	-	26,000	869	53,000	91,000
259	-	19,000	453	-	74,000	873	-	29,000
263.3	11,000	25,000	465	-	53,000	891	-	37,000
263.6	-	13,000	477	-	40,000	907	111,000	181,000
263.7	10,000	29,000	499	63,000	240,000	959	-	37,000
263.9	42,000	71,000	511	-	13,000	989	-	16,000
297	-	53,000	513	18,000	83,000			

Figure 11. Flooding for 10-Yr and 50-Yr Storms: Future Hydrology, Future Drainage With Improvements (Scenario 3)



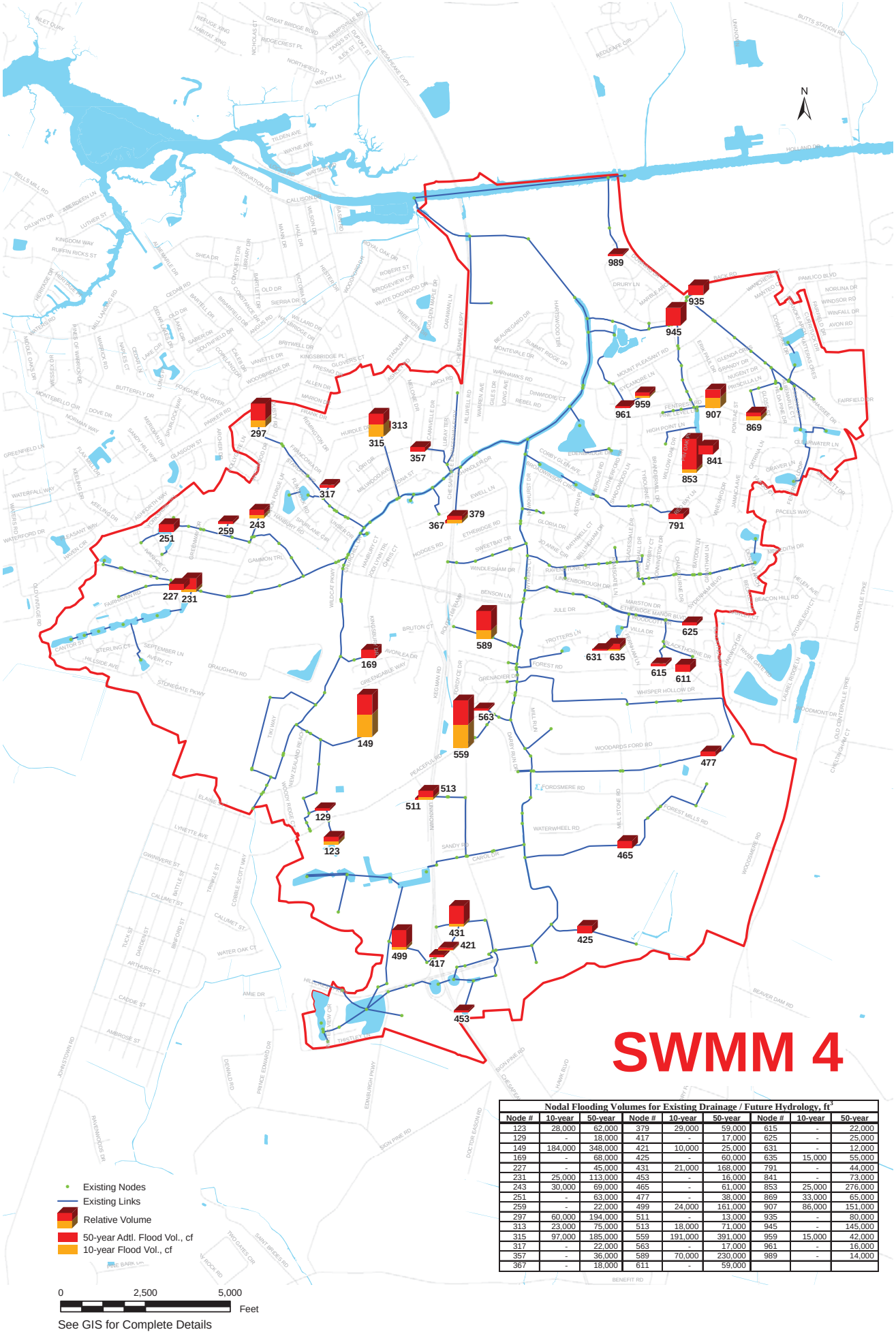
Nodal Flooding Volumes for Existing Drainage / Existing Hydrology, ft^3								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	-	25,000	417	-	17,000	625	-	25,000
129	-	12,000	421	-	24,000	631	-	12,000
149	43,000	111,000	431	18,000	164,000	635	15,000	55,000
227	-	34,000	453	-	14,000	791	-	42,000
231	12,000	74,000	465	-	29,000	841	-	73,000
243	12,000	34,000	477	-	39,000	853	25,000	277,000
251	-	63,000	499	16,000	138,000	869	33,000	65,000
259	-	22,000	511	-	13,000	907	86,000	151,000
297	56,000	188,000	513	17,000	69,000	945	-	89,000
313	23,000	73,000	559	81,000	220,000	959	15,000	42,000
315	96,000	181,000	563	-	17,000	961	-	16,000
317	-	23,000	589	70,000	228,000	989	-	12,000
357	-	36,000	611	-	59,000			
379	29,000	80,000	615	-	23,000			

Figure C-1. Flooding for 10-Yr and 50-Yr Storms: Existing Hydrology, Existing Drainage (Scenario 1) - SWMM 4



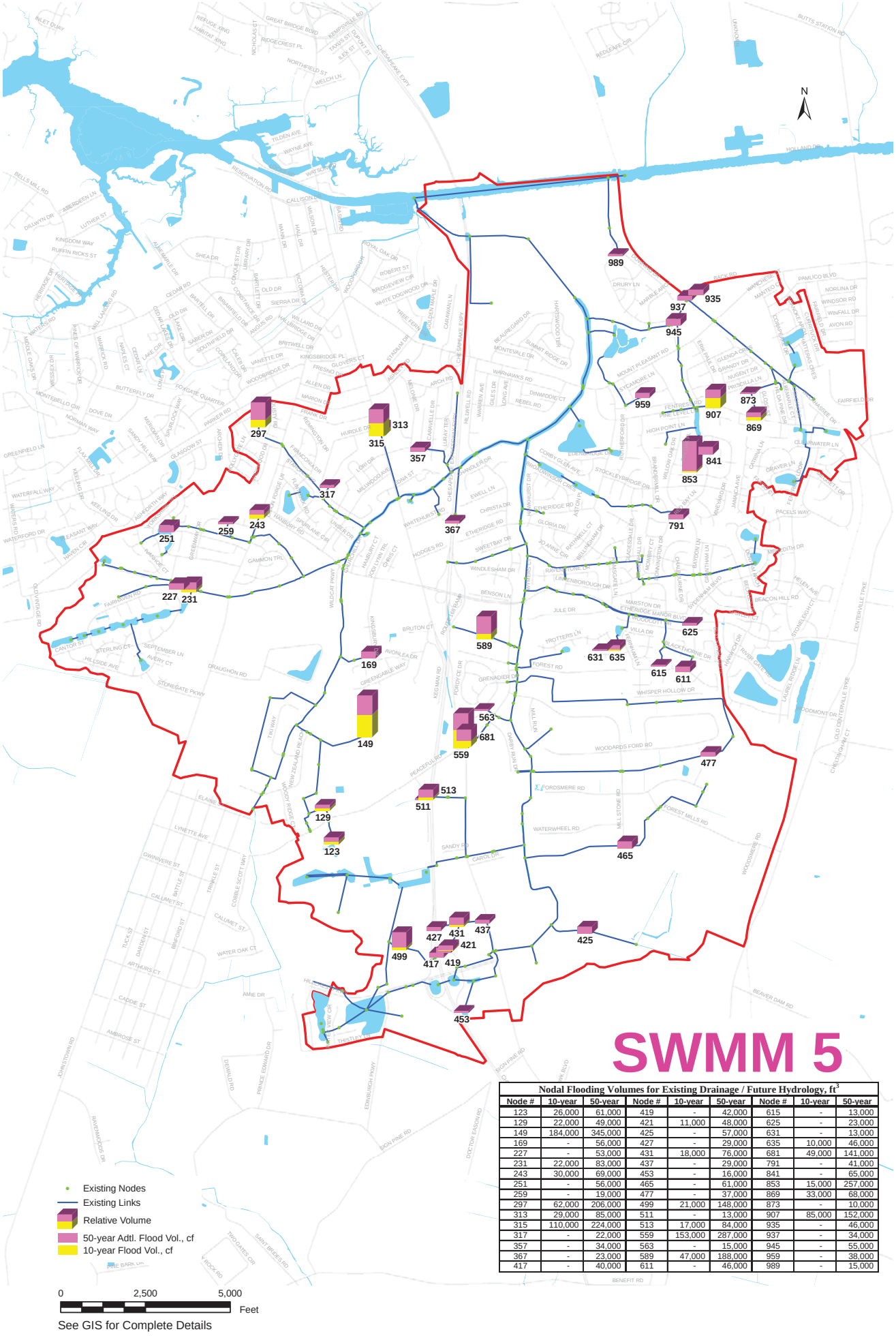
Nodal Flooding Volumes for Existing Drainage / Existing Hydrology, ft³								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	-	23,000	419	-	41,000	615	-	13,000
129	-	27,000	421	10,000	47,000	625	-	23,000
149	45,000	112,000	427	-	28,000	631	-	13,000
227	-	37,000	431	16,000	75,000	635	10,000	46,000
231	10,000	60,000	437	-	26,000	681	-	61,000
243	11,000	34,000	453	-	15,000	791	-	41,000
251	-	56,000	465	-	32,000	841	-	65,000
259	-	19,000	477	-	38,000	853	15,000	257,000
297	57,000	190,000	499	14,000	128,000	869	33,000	66,000
313	29,000	83,000	511	-	13,000	907	85,000	152,000
315	109,000	221,000	513	16,000	82,000	945	-	15,000
317	-	22,000	559	75,000	174,000	959	-	38,000
357	-	34,000	563	-	11,000	989	-	15,000
367	-	23,000	589	47,000	188,000			
417	-	39,000	611	-	46,000			

Figure C-2. Flooding for 10-Yr and 50-Yr Storms: Existing Hydrology, Existing Drainage (Scenario 1) - SWMM 5



Nodal Flooding Volumes for Existing Drainage / Future Hydrology, ft^3								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	28,000	62,000	379	29,000	59,000	615	-	22,000
129	-	18,000	417	-	17,000	625	-	25,000
149	184,000	348,000	421	10,000	25,000	631	-	12,000
169	-	68,000	425	-	60,000	635	15,000	55,000
227	-	45,000	431	21,000	168,000	791	-	44,000
231	25,000	113,000	453	-	16,000	841	-	73,000
243	30,000	69,000	465	-	61,000	853	25,000	276,000
251	-	63,000	477	-	38,000	869	33,000	65,000
259	-	22,000	499	24,000	161,000	907	86,000	151,000
297	60,000	194,000	511	-	13,000	935	-	80,000
313	23,000	75,000	513	18,000	71,000	945	-	145,000
315	97,000	185,000	559	191,000	391,000	959	15,000	42,000
317	-	22,000	563	-	17,000	961	-	16,000
357	-	36,000	589	70,000	230,000	989	-	14,000
367	-	18,000	611	-	59,000			

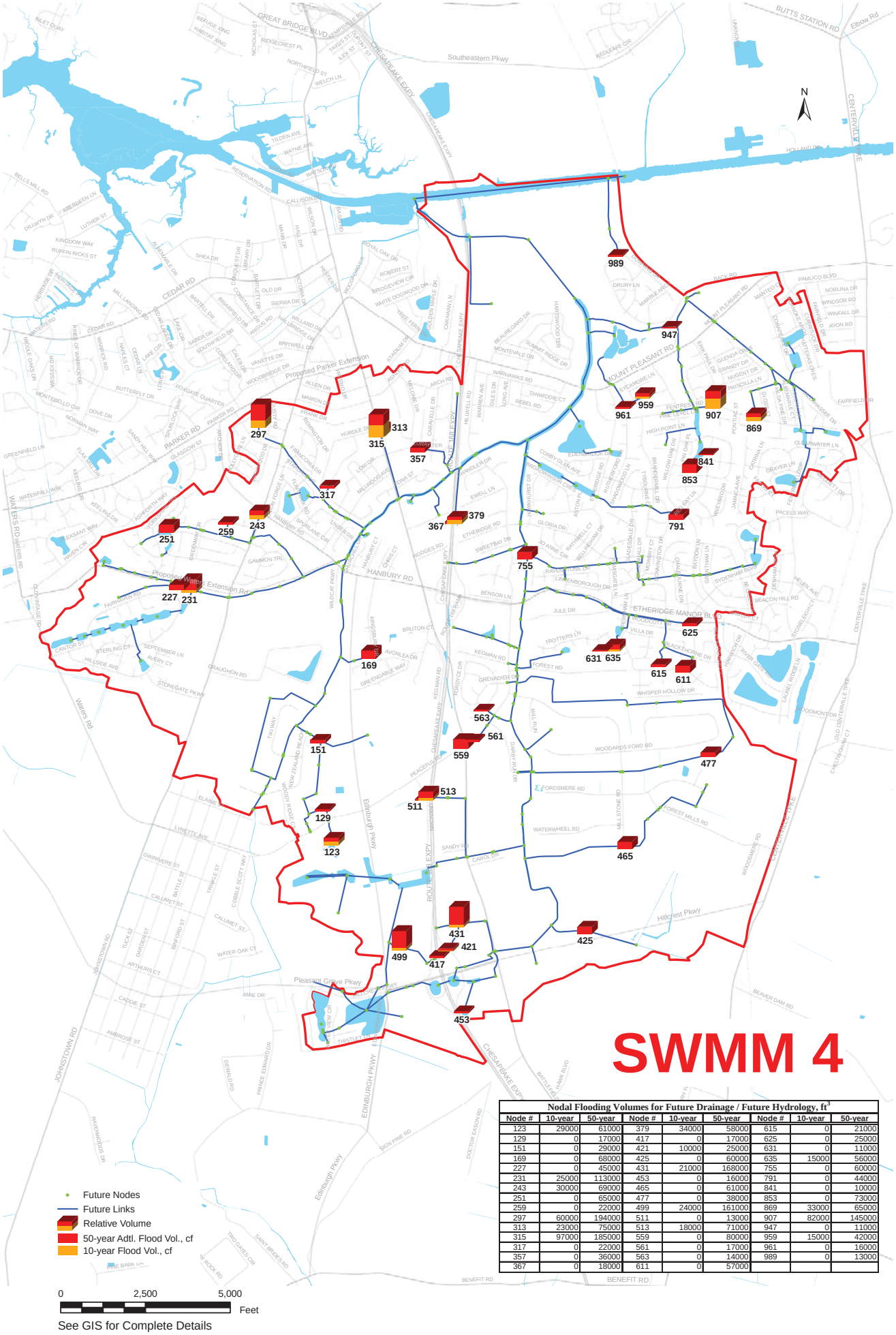
Figure C-3. Flooding for 10-Yr and 50-Yr Storms: Future Hydrology, Existing Drainage (Scenario 2) - SWMM 4



Nodal Flooding Volumes for Existing Drainage / Future Hydrology, ft^3

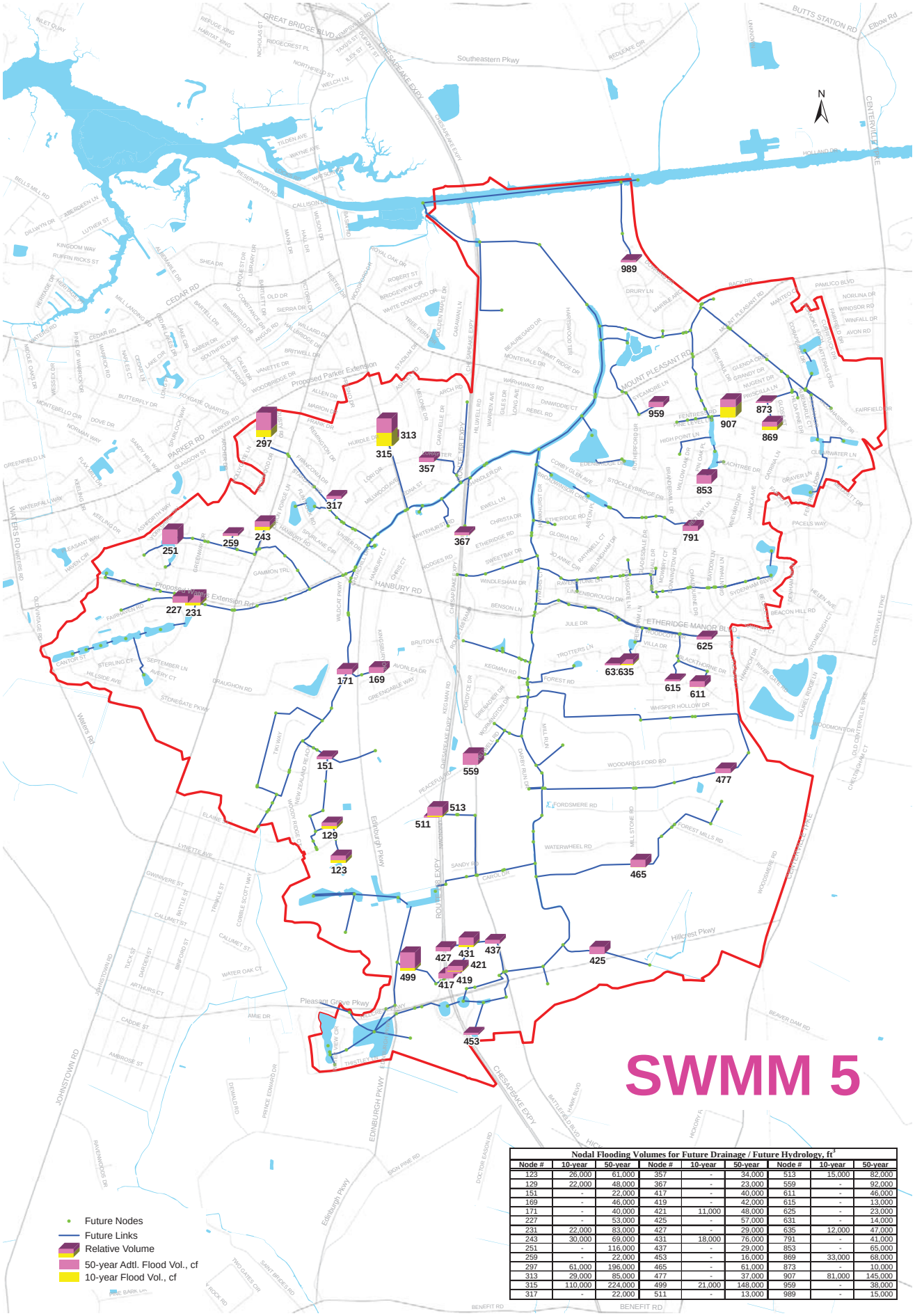
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	26,000	61,000	419	-	42,000	615	-	13,000
129	22,000	49,000	421	11,000	48,000	625	-	23,000
149	184,000	345,000	425	-	57,000	631	-	13,000
169	-	56,000	427	-	29,000	635	10,000	46,000
227	-	53,000	431	18,000	76,000	681	49,000	141,000
231	22,000	83,000	437	-	29,000	791	-	41,000
243	30,000	69,000	453	-	16,000	841	-	65,000
251	-	56,000	465	-	61,000	853	15,000	257,000
259	-	19,000	477	-	37,000	869	33,000	68,000
297	62,000	206,000	499	21,000	148,000	873	-	10,000
313	29,000	85,000	511	-	13,000	907	85,000	152,000
315	110,000	224,000	513	17,000	84,000	935	-	46,000
317	-	22,000	559	153,000	287,000	937	-	34,000
357	-	34,000	563	-	15,000	945	-	55,000
367	-	23,000	589	47,000	188,000	959	-	38,000
417	-	40,000	611	-	46,000	989	-	15,000

Figure C-4. Flooding for 10-Yr and 50-Yr Storms: Future Hydrology, Existing Drainage (Scenario 2) - SWMM 5



Nodal Flooding Volumes for Future Drainage / Future Hydrology, ft^3								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	29000	61000	379	34000	58000	615	0	21000
129	0	17000	417	0	17000	625	0	25000
151	0	29000	421	10000	25000	631	0	11000
169	0	68000	425	0	60000	635	15000	56000
227	0	45000	431	21000	168000	755	0	60000
231	25000	113000	453	0	16000	791	0	44000
243	30000	69000	465	0	61000	841	0	10000
251	0	65000	477	0	38000	853	0	73000
259	0	22000	499	24000	161000	869	33000	65000
297	60000	194000	511	0	13000	907	82000	145000
313	23000	75000	513	18000	71000	947	0	11000
315	97000	185000	559	0	80000	959	15000	42000
317	0	22000	561	0	17000	961	0	16000
357	0	36000	563	0	14000	989	0	13000
367	0	18000	611	0	57000			

Figure C-5. Flooding for 10-Yr and 50-Yr Storms: Future Hydrology, Future Drainage (Scenario 3) - SWMM 4



Nodal Flooding Volumes for Future Drainage / Future Hydrology, ft³								
Node #	10-year	50-year	Node #	10-year	50-year	Node #	10-year	50-year
123	26,000	61,000	357	-	34,000	513	15,000	82,000
129	22,000	48,000	367	-	23,000	559	-	92,000
151	-	22,000	417	-	40,000	611	-	46,000
169	-	46,000	419	-	42,000	615	-	13,000
171	-	40,000	421	11,000	48,000	625	-	23,000
227	-	53,000	425	-	57,000	631	-	14,000
231	22,000	83,000	427	-	29,000	635	12,000	47,000
243	30,000	69,000	431	18,000	76,000	791	-	41,000
251	-	116,000	437	-	29,000	853	-	65,000
259	-	22,000	453	-	16,000	869	33,000	68,000
297	61,000	196,000	465	-	61,000	873	-	10,000
313	29,000	85,000	477	-	37,000	907	81,000	145,000
315	110,000	224,000	499	21,000	148,000	959	-	38,000
317	-	22,000	511	-	13,000	989	-	15,000

Figure C-6. Flooding for 10-Yr and 50-Yr Storms: Future Hydrology, Future Drainage (Scenario 3) - SWMM 5