

**Ten Mile Creek Amendment
Appendix 2**

**Description of Modeling Scenarios and Assumptions
Updated October 2013**

Testing Scenario Descriptions

Description of Scenarios for Environmental Testing (Scenario 1 was a previous test of the 1994 plan that was discarded due to changed methodologies):

2. **1994 Plan** - The 1994 Clarksburg Master Plan recommendations for density and land use in Stage 4, assuming full Environmental Site Design for the developable and redevelopable properties. The full length and width of the 355 Bypass is included, assuming that minimal bridging will be required.
3. **1994 Plan-Reduced Footprint, Same Yield** - The same as Scenario 1 with a reduced footprint for the Pulte properties. Assumes a different unit mix that would allow approximately the same number of units permitted by the 1994 plan. In addition, the 355 Bypass is shortened, reducing the impact on one stream crossing and adding more developable area to the Miles/Coppola and Egan properties. Imperviousness assumed on the County property is reduced from 15% to 8%.
4. **1994 Plan-Reduced Footprint Lower Yield** - The same as Scenario 3 with the same unit mix as recommended in the 1994 Plan for the Pulte property, resulting in fewer potential units on the Pulte property.
5. **7% Watershed Imperviousness** – The same as Scenario 4 with reduced yield on Miles/Coppola, Egan, Pulte, and the County property is assumed as undeveloped beyond that planned for the Detention Center minor expansion.

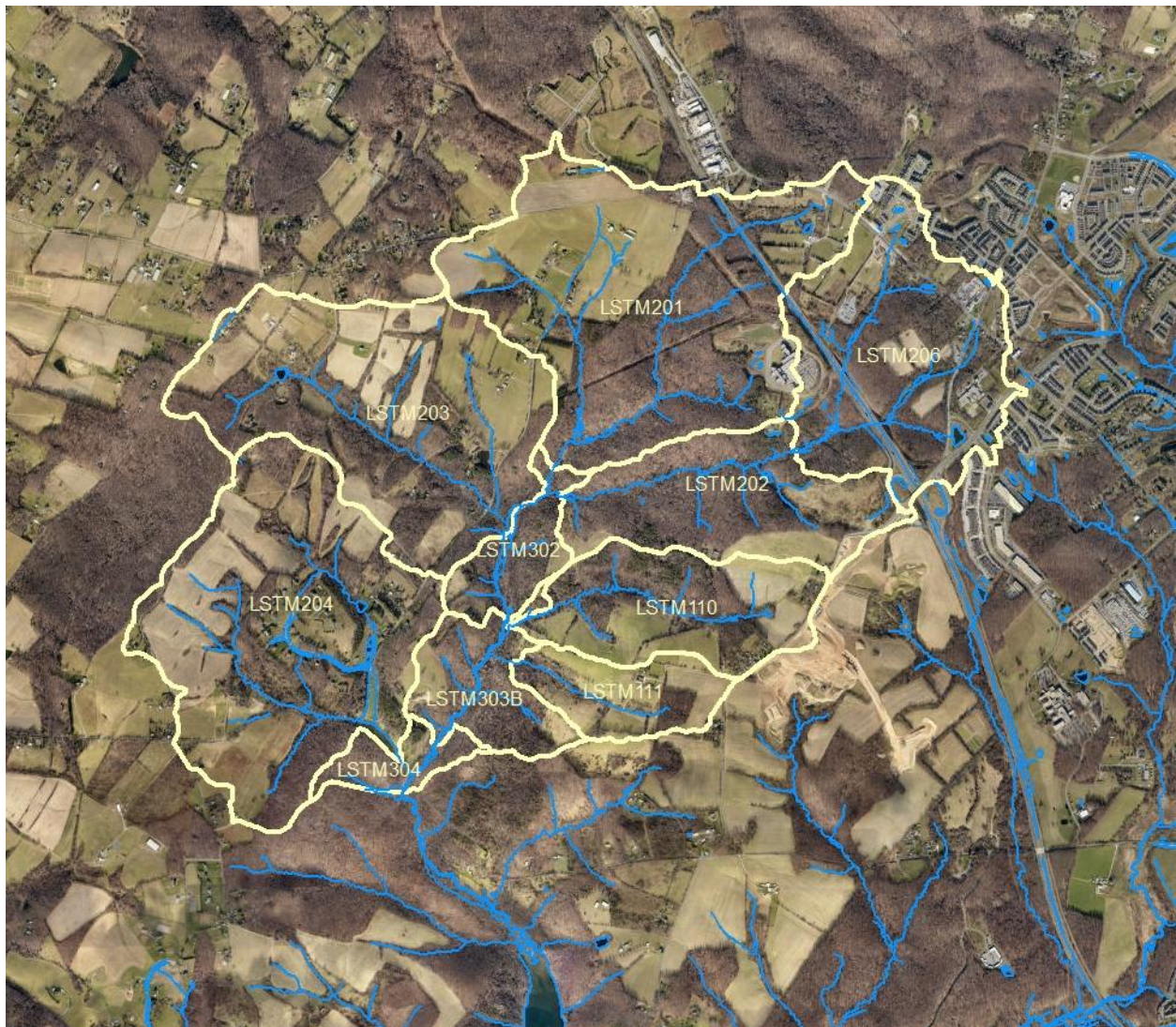
All Scenarios include the following assumptions:

- Typical Environmental Site Design as prescribed by County regulations and the Maryland Stormwater Design Manual. For purposes of hydrologic modeling a single type of bioretention practice was chosen as representative of ESD with the following characteristics:
 - Ponding above media – 9”
 - Media depth - 3.5’
 - Maximum infiltration rate = 2”/hr.
 - Minimum infiltration rate = 0.25”/hr.
 - Continuous infiltration rate = 0.05”/hr.
 - Underdrains above stone reservoir with overflow to surface waters reduce potential for infiltration to native soil
 - Gravel bedding – 3” required
- Soil Decompaction per County regulations for all areas disturbed and not covered by buildings, paving or stormwater management. This assumes soils are compacted to represent the next most compacted soil group, then decompacting to be halfway between that and the original soil group.
- Reforestation of unforested stream buffers, with any unforested areas between the stream buffer and the limit of disturbance as meadow in good condition. This was assumed because, while the stream buffer is required to be planted to a high standard and managed to achieve a closed canopy

as soon as possible, other unforested areas are more likely to be either managed as meadow or allowed to naturally reforest, taking substantially longer to achieve a closed canopy.

- ESD for all properties along 355 and that are likely to redevelop and for vacant properties
- ESD is used for the Bypass, but the new lanes on I-270 would use traditional stormwater management due to the ROW constraints and topography.

The subwatersheds shown below were used in the calculations of imperviousness in the scenario testing.



Scenario Imperviousness Assumptions

Scenario 2 1994 Plan Updated

Development Name	Land Use	Density	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	Residential	4 units/ac	50.15%	56.78	100.06	28.47	28.5%
Miles Coppola/Peterson	Office/Residential	50%office 50% res	60.03%	42.46	98.64	25.49	25.8%
County Site	Office	Office	41.56%	45.72	124.77	19.00	15.2%
Pulte	Residential	2 units/ac	33.02%	198.28	523.44	65.48	12.5%
Fire Station	Institutional	NA	37.00%	4.08	4.08	1.51	37.0%
Hammer Hill	Commercial	commercial	30.00%	2.93	2.93	0.88	30.0%
Historic District Commercial	Commercial	NA	80.00%	0.71	0.71	0.57	80.0%
Historic District Residential	Residential	2 units/ac	15.40%	4.46	4.46	0.69	15.4%
Historic District Residential	Residential	2 units/ac	15.40%	7.40	7.40	1.14	15.4%
355 Bypass	Roadway/Transitway	NA	30.40%	38.43	38.43	11.68	30.4%
I-270 widening	Roadway/Transitway	NA	100.00%	3.57	3.57	3.57	99.9%
Rural Properties	Residential	1 unit/5 acres	43.00%	30.93	223.39	13.30	6.0%
Total						171.78	

Approximate Watershed
Imperviousness 9.3%

Scenario 3 Reduced Footprints/1994 Unit Mix

Development Name	Land Use	Density	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	Residential	4 units/ac	50.15%	61.33	100.06	30.76	30.7%
Miles Coppola/Peterson	Office/Residential	50%office 50% res	60.03%	48.91	98.64	29.36	29.8%
County Site	Office	Office	41.56%	24.67	124.77	10.25	8.2%
Pulte	Residential	2 units/ac	40.00%	119.10	523.44	47.64	9.1%
Fire Station	Institutional	NA	37.00%	4.08	4.08	1.51	37.0%
Hammer Hill	Commercial	commercial	30.00%	2.93	2.93	0.88	30.0%
Historic District Commercial	Commercial	NA	80.00%	0.71	0.71	0.57	80.0%
Historic District Residential	Residential	2 units/ac	15.40%	4.84	4.84	0.75	15.4%
Historic District Residential	Residential	2 units/ac	15.40%	7.40	7.40	1.14	15.4%
355 Bypass	Roadway/Transitway	NA	63.06%	12.40	12.40	7.82	63.1%
I-270 widening	Roadway/Transitway	NA	100.00%	3.57	3.57	3.57	99.9%
Rural Properties	Residential	1 unit/5 acres	43.00%	30.93	223.39	13.30	6.0%
Total Imperviousness						147.54	

Approximate Watershed
Imperviousness 8.5%

Scenario 4 Reduced Imperviousness/1994 Unit Mix

Development Name	Land Use	Density	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	Residential	4 units/ac	50.15%	61.34	100.06	30.76	30.7%
Miles Coppola/Peterson	Office/Residential	50%office 50% res	60.03%	48.91	98.64	29.36	29.8%
County Site	Office	Office	41.56%	24.62	124.77	10.23	8.2%
Pulte	Residential	1 unit/ac	33.02%	119.00	523.44	39.29	7.5%
Fire Station	Institutional	NA	37.00%	4.08	4.08	1.51	37.0%
Hammer Hill	Commercial	commercial	30.00%	2.93	2.93	0.88	30.0%
Historic District Residential	Residential	2 units/ac	15.40%	4.84	4.84	0.75	15.4%
Historic District Residential	Residential	2 units/ac	15.40%	7.40	7.40	1.14	15.4%
Historic District Commercial	Commercial	NA	80.00%	0.71	0.71	0.57	80.0%
355 Bypass	Roadway/Transitway	NA	63.06%	12.40	12.40	7.82	63.1%
I-270 widening	Roadway/Transitway	NA	100.00%	3.57	3.57	3.57	99.9%
Rural Properties	Residential	1 unit/5 acres	43.00%	30.93	223.39	13.30	6.0%
Total						139.18	

Approximate Watershed Imperviousness 8.4%

Scenario 5 Seven Percent Overall Imperviousness

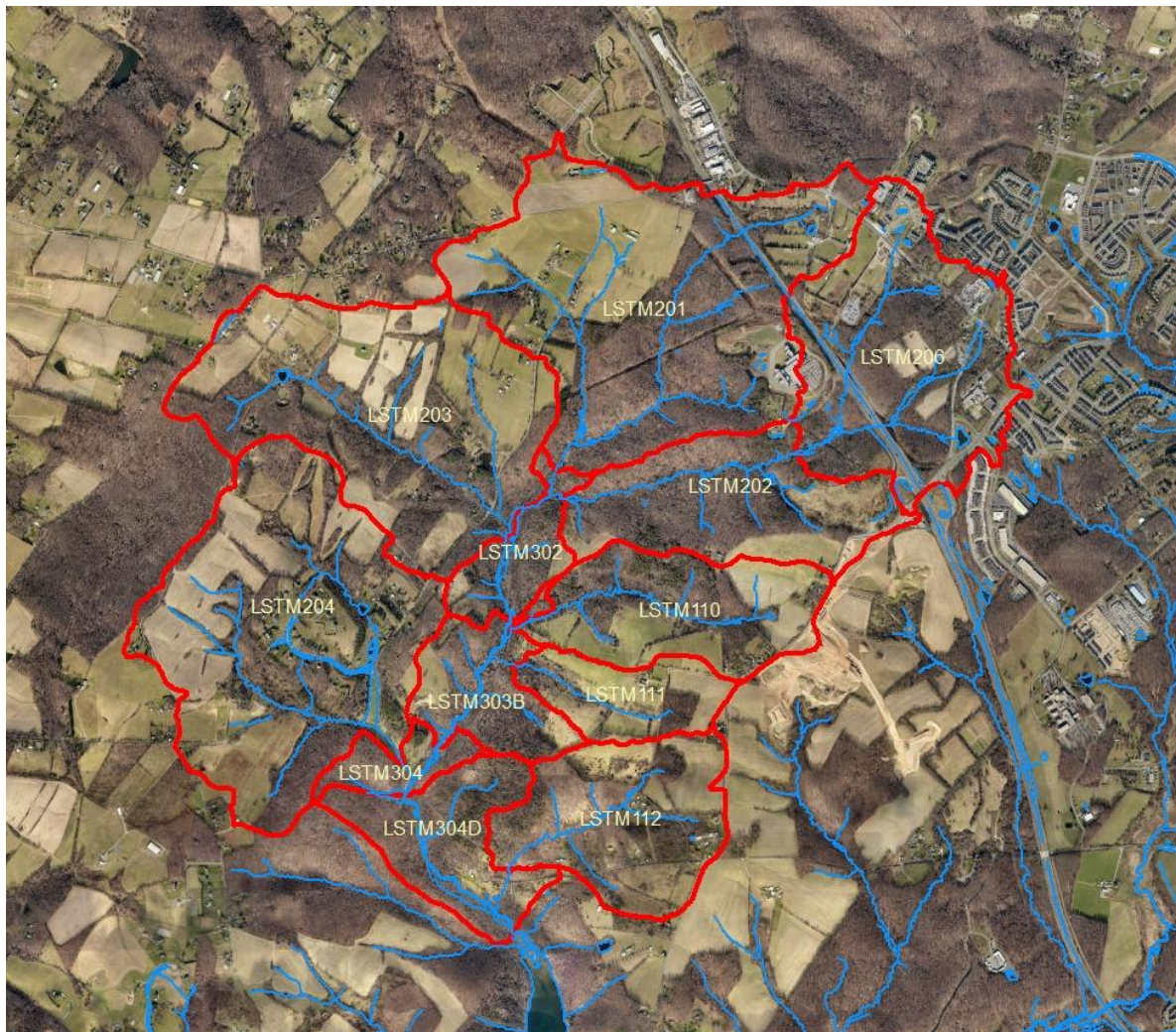
Development Name	Land Use	Density	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	Residential	2 units/ac	32.60%	61.34	100.06	20.00	20.0%
Miles Coppola/Peterson	Office/Residential	50%office 50% res	40.90%	49.82	98.64	20.00	20.3%
County Site	Office	Office	0.00%	24.62	124.77	0.00	0.0%
Pulte	Residential	1 unit/ac	31.00%	119.00	523.44	36.89	7.0%
Fire Station	Institutional	NA	37.00%	4.08	4.08	1.51	37.0%
Hammer Hill	Commercial	commercial	30.00%	2.93	2.93	0.88	30.0%
Historic District Residential	Residential	2 units/ac	15.40%	4.84	4.84	0.75	15.4%
Historic District Residential	Residential	2 units/ac	15.40%	7.40	7.40	1.14	15.4%
Historic District Commercial	Commercial	NA	80.00%	0.71	0.71	0.57	80.0%
355 Bypass	Roadway/Transitway	NA	57.3%	10.47	10.47	6.00	57.3%
I-270 widening	Roadway/Transitway	NA	100.00%	3.57	3.57	3.57	99.9%
Rural Properties	Residential	1 unit/5 acres	43.00%	19		8.00	6.4%
Total						99.31	

Approximate Watershed Imperviousness 7.0%

Additional Analyses

During the Planning Board worksessions, questions were raised about the extent of the watershed above Little Seneca Lake and the Department of Environmental Protection was consulted on the whether or not to include two subwatersheds that flow to a short segment of stream below Old Baltimore Road. LSTM112 was added which includes a portion of the Pulte and King properties and a small, unnamed subwatershed (shown as “LSTM304D”) that encompasses the mainstem into which LSTM112 and two other small tributaries flow.

The 1994 Plan scenario was re-run as well as the Public Hearing Draft and the Developer requests voiced at the Public hearing. In addition, the Planning Board asked staff to run an alternative scenario (Alternative 2) that would increase the density on the Pulte and King Properties. The tables below give the assumptions and resulting watershed imperviousness. See the graphic below for the subwatersheds used in the second set of analyses.



1994 Plan Revised

Development Name	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	50.2%	56.78	100.06	28.52	28.5%
County Detention Center Props	68.2%	64.42	293.00	43.95	15.0%
Miles Coppola/Peterson	55.3%	42.46	94.00	23.50	25.0%
County Site	40.9%	45.72	124.77	18.72	15.0%
Pulte	33.0%	198.28	523.44	65.43	12.5%
Fire Station	37.0%	4.08	4.08	1.51	37.0%
Hammer Hill	30.0%	2.93	2.93	0.88	30.0%
Historic District Commercial	80.0%	0.71	0.71	0.57	80.0%
Historic District Residential	15.4%	4.46	4.46	0.69	15.4%
Historic District Residential	15.4%	7.40	7.40	1.14	15.4%
355 Bypass	30.4%	38.43	38.43	11.68	30.4%
I-270 widening	100.0%	3.57	3.57	3.57	100.0%
Rural Properties	6.50%	203.60	223.39	13.23	5.9%
Total				213.39	

Approximate Watershed
Imperviousness 9.8%

Public Hearing Draft

Development Name	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	40.78%	61.34	100.06	25.02	25.0%
County Detention Center Props	19.10%	64.42	293.00	12.31	4.2%
Miles Coppola/Peterson	47.17%	49.82	94.00	23.50	25.0%
County Site	40.54%	24.62	124.77	9.98	8.0%
Pulte	35.19%	119.00	523.44	41.88	8.0%
Fire Station	37.00%	4.08	4.08	1.51	37.0%
Hammer Hill	30.00%	2.93	2.93	0.88	30.0%
Historic District Residential	25.00%	4.84	4.84	1.21	25.0%
Historic District Residential	25.00%	7.40	7.40	1.85	25.0%
Historic District Commercial	80.00%	0.71	0.71	0.57	80.00%
355 Bypass	57.3%	10.47	10.47	6.00	57.3%
I-270 widening	100.00%	3.57	3.57	3.57	100.0%
Rural Properties	7.50%	104.19	104.19	7.81	7.5%
Total				136.08	

Approximate Watershed
Imperviousness 7.5%

Developer Requests

Development Name	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	40.78%	61.34	100.06	25.02	25.0%
Miles Coppola/Peterson	66.03%	49.82	94.00	32.90	35.0%
County Detention Center Props	68.22%	64.42	293.00	43.95	15.0%
County Site	76.02%	24.62	124.77	18.72	15.0%
Pulte	74.78%	119.00	523.44	88.98	17.0%
Fire Station	35.19%	4.08	4.08	1.44	35.2%
Hammer Hill	37.00%	2.93	2.93	1.09	37.0%
Historic District Residential	25.00%	4.84	4.84	1.21	25.0%
Historic District Residential	25.00%	7.40	7.40	1.85	25.0%
Historic District Commercial	80.00%	0.71	0.71	0.57	80.0%
355 Bypass	57.3%	10.47	10.47	6.01	57.4%
I-270 widening	100.00%	3.57	3.57	3.57	100.0%
Rural Properties	7.50%	104.19	104.19	7.81	7.5%
Total				233.11	

Approximate Watershed
Imperviousness 10.6%

Alternative 2

Development Name	Imperviousness Percentage of Disturbed Area	Acres of Disturbed Area	Property Acreage (per GIS polygon)	Imp acres	Gross imp %
Egan/Brookfield	40.78%	61.34	100.06	25.02	25.0%
County Detention Center Props	20.47%	64.42	293.00	13.19	4.5%
Miles Coppola/Peterson	47.17%	49.82	94.00	23.50	25.0%
County Site	40.54%	24.62	124.77	9.98	8.0%
Pulte	43.99%	119.00	523.44	52.34	10.0%
Fire Station	37.00%	4.08	4.08	1.51	37.0%
Hammer Hill	30.00%	2.93	2.93	0.88	30.0%
Historic District Residential	25.00%	4.84	4.84	1.21	25.0%
Historic District Residential	25.00%	7.40	7.40	1.85	25.0%
Historic District Commercial	80.00%	0.71	0.71	0.57	80.0%
355 Bypass	57.3%	10.47	10.47	6.00	57.3%
I-270 widening	100.00%	3.57	3.57	3.57	100.0%
Rural Properties	7.50%	104.19	104.19	7.81	7.5%
Total				147.43	

Approximate Watershed
Imperviousness 7.9%

Description of Scenarios for Transportation Testing

- A. 2040 No-Bypass – This projects traffic assuming growth according to the Round 8.1 forecast based on existing and planned zoning from the 1994 Clarksburg Master Plan. While it assumes an improved interchange at I-270 and 121 and two additional lanes on I-270 north of the interchange, it does not include a bypass of 355.
- B. 2040 – This is the same as above, assuming the four-lane bypass is built.
- C. 2040 High No-Bypass – This projects traffic the same as Scenario A, but substitutes retail uses as proposed by developers on the Miles/Coppola property and in Cabin Branch for the office uses in A and B.
- D. 2040 High – This is the same as C, but with the bypass of 355.