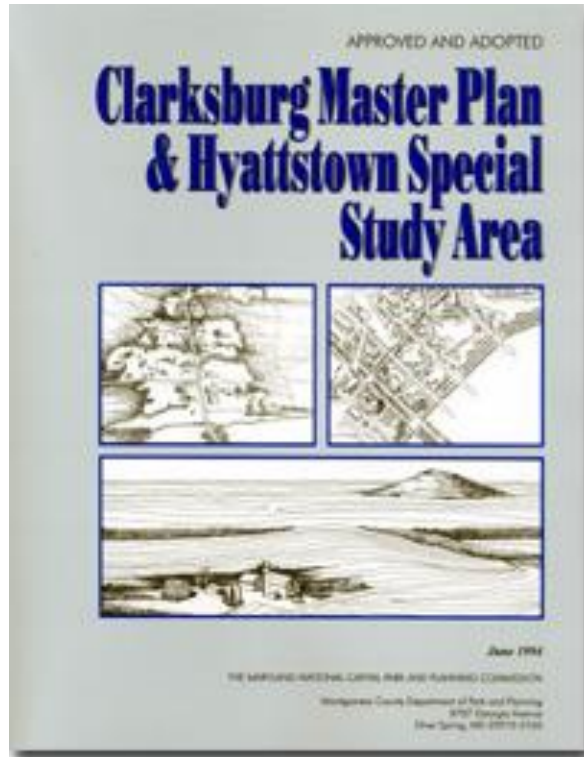




10 Mile Creek Area Limited Amendment

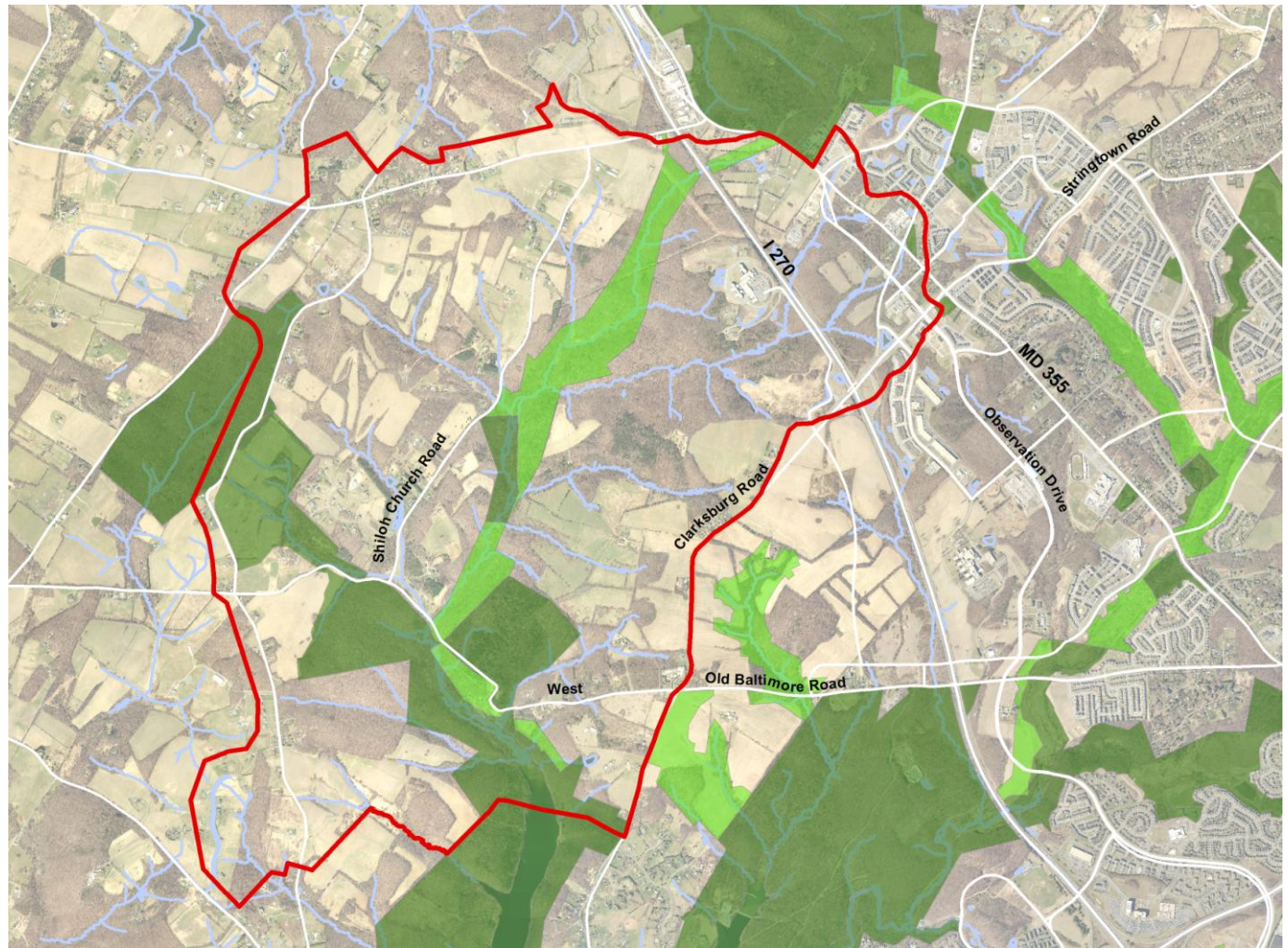


Clarksburg Limited Master Plan
Planning Board Worksession
May 9, 2013

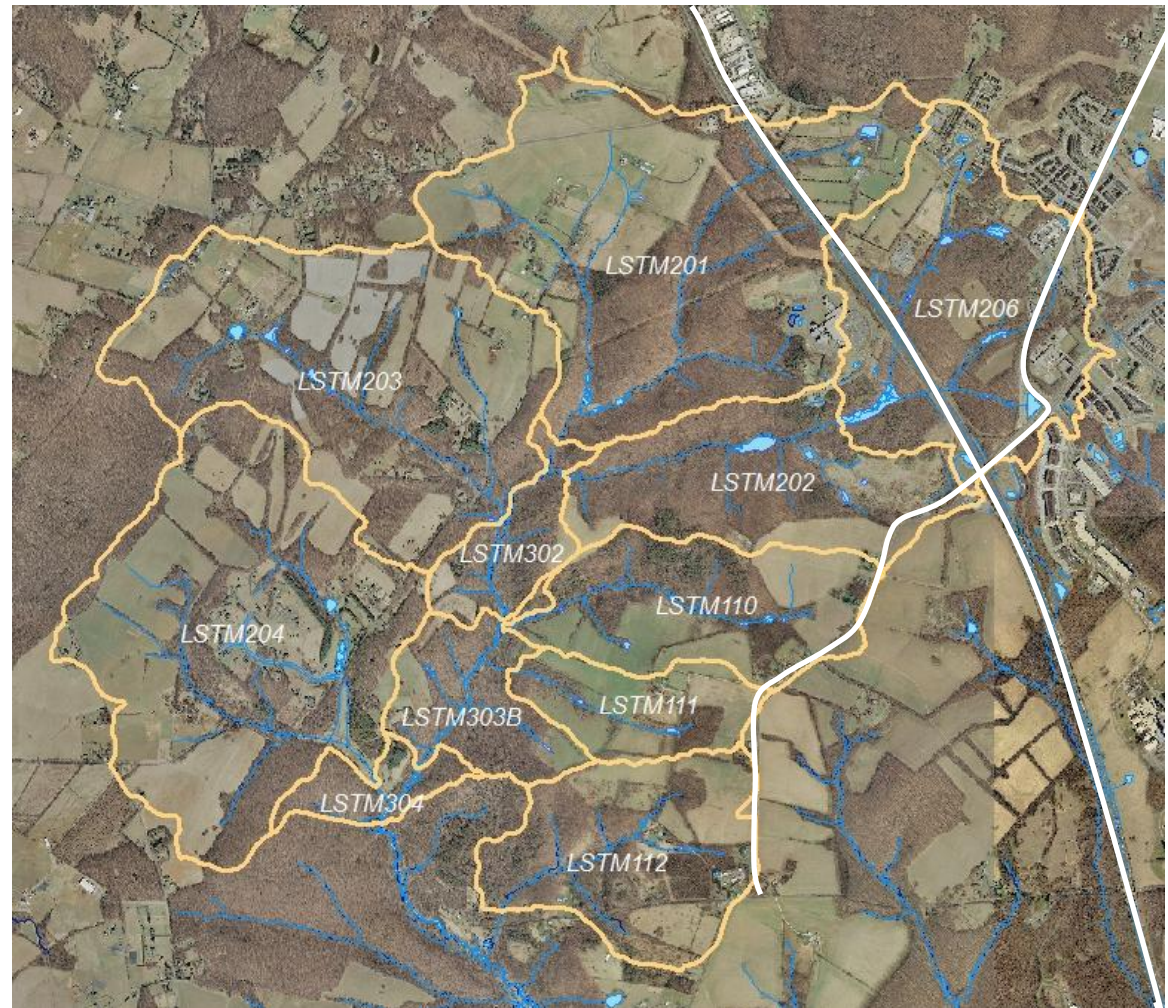
Agenda

- Introductions
- Questions and Concerns
- Discussion
- Alternative Scenarios
- Discussion





Sub Watersheds



Overall Considerations

- This is a planning-level effort
- Modeling
 - Even if we could program in development-review level information, it could easily change at time of development review
 - Modeling exercises have limitations
 - Meant for comparative, not absolute predictions
- Scientific literature is also important
- Consultants and experts agree on the best methods of analysis
- Modeling cannot give absolute conclusions
- Some margin of safety for the stream should be considered

- Data base accurate?
- Quality of LSTM 206?
- State view on ESD and the degree to which it can protect sensitive streams?
- Imperviousness a relevant measure?
- Modeling assumptions appropriate?
- Can off-site mitigation offset impacts?
- Scenarios to be evaluated?

Is the Data Base Accurate?

- More detail than ever for a master plan
- Well-documented – resources identified, located and photographed
- Disputed areas have been double checked
- Stormwater discharges accounted for separately
- Enforcement – a separate issue



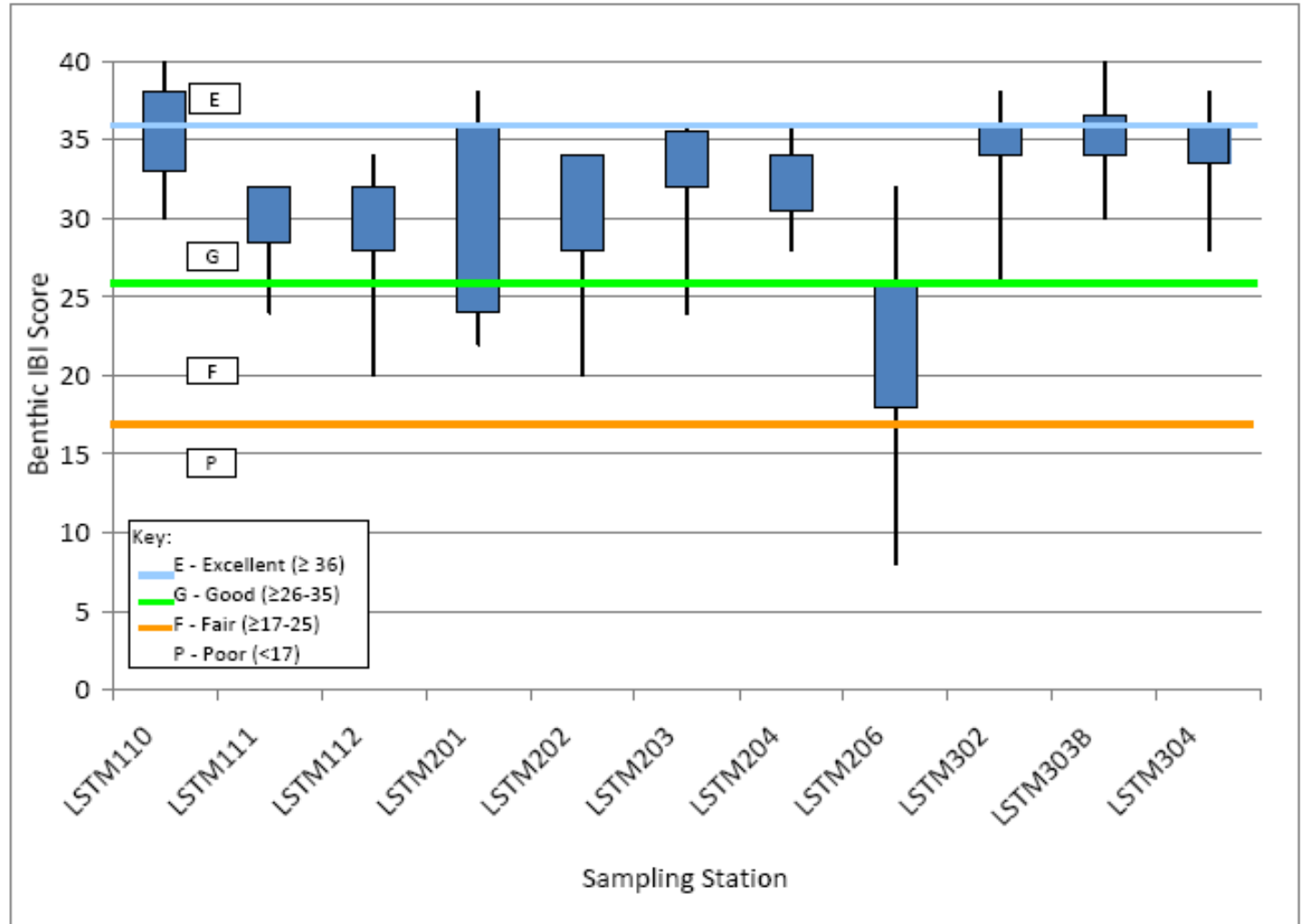
What is the Quality of LSTM 206?

- Different from other sub-watersheds
- Stream quality rated at downstream point, not for each stream segment
- Forest buffer currently helps offset some of the most extreme upstream impacts
- Using the DEP rating system, the stream is consistently fair, occasionally rated good



What is the Quality of LSTM 206?

Benthic IBI, Average, 1994-2012



What is the State view of ESD and What is it Intended to Achieve?

- The Stormwater Management Act [§4-201.1(b)] defines ESD as using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics.
- The State fundamental performance standard for ESD is to mimic the hydrology of “woods in good hydrologic condition” (SWM Manual, 5.2.1)
- ESD cannot mimic the many other environmental functions lost to development

What Does ESD Include?

- The Maryland Stormwater Manual (5.0.3) states that ESD includes:
 - Optimizing conservation of natural features
 - Minimizing impervious surfaces
 - Slowing down runoff to maintain discharge timing and to increase infiltration and evapotranspiration.
 - Using other nonstructural practices or innovative technologies approved by MDE.”



Typical Centralized Detention Pond

Small Scale, Integrated ESD Practices

ESD is Not Alone

- Forest Conservation requirements
 - Protect and reforest stream buffers in SPA
 - Require advance reforestation
 - Wider wetland buffers
- Erosion and Sediment Control
 - Limit of 20 acres cleared at one time

Is Imperviousness Still an Important Factor in Protecting the Environment?

- Section 5.0.3 of the Maryland Stormwater Design Manual recognizes the many scientific studies that
“indicate that stream biodiversity decreases as impervious cover increases. There is no simple formula, rule, or threshold for determining how much impervious cover may be sustained in a given watershed. These studies establish a fundamental connection between impervious cover and watershed impairment.”
- Imperviousness limits reduce impacts to all the environmental functions of natural areas, of which hydrology is but one

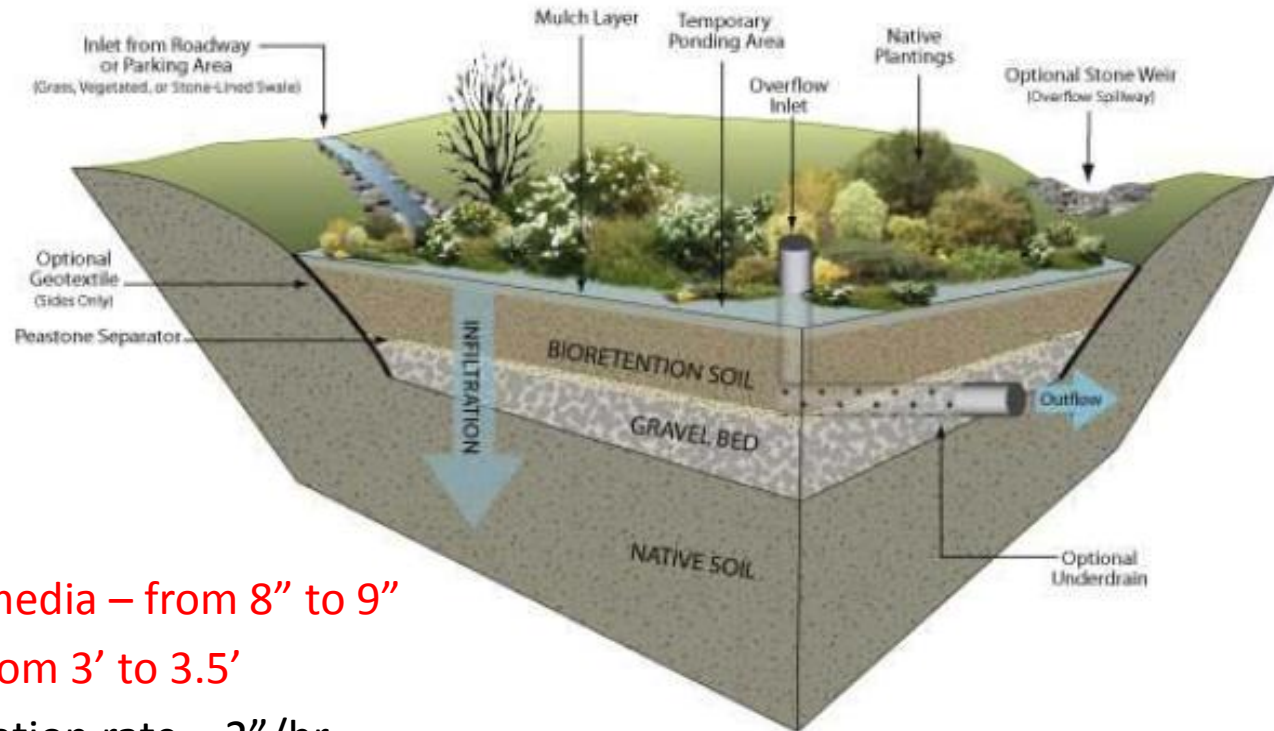
Are Other Measures Needed in Addition to ESD?

- Because MDE deals with hydrology, not land use, it stresses “minimizing imperviousness” as part of ESD, and does not require imperviousness limits
- Where sensitive waters exist, local jurisdictions should combine ESD with other appropriate measures (e.g. limiting imperviousness, and increasing natural areas) to provide extra protection
- The State limits imperviousness to protect sensitive areas of the Chesapeake Bay

Modeling Assumptions

- Assumptions for analysis at a master plan scale – not site scale
 - Appropriate detail
 - Comparative results
- DPS and DEP input to approximate County requirements
- Adjustments made based on stakeholder comments
- Treatment train is generally not required
 - If more traditional methods are included on more densely developed sites, treatment trains may be considered by DPS
 - Not necessary to model
- Represent appropriate hydrologic assumptions

Modeling Assumptions



- Ponding above media – from 8” to 9”
- Media depth - from 3’ to 3.5’
- Maximum infiltration rate = 2”/hr.
- Minimum infiltration rate = 0.25”/hr.
- Continuous infiltration rate – from 0.025”/hr. to 0.05”/hr.

- Underdrains above stone reservoir with overflow to surface waters reduce potential for infiltration to native soil
- Gravel bedding – 3” required

Modeling Assumptions

- Additional changes considered, **but not made**
 - Requiring additional storage volume in ESD practices
 - The woods in good condition standard should control hydrology of 98% of storms if fully implemented
 - Assuming added storage volume will not significantly change the hydrograph
 - Applying ESD practices to existing roadways
 - State highways not directly controlled by the County
 - Linear nature and constrained ROW's limit the applicability of ESD practices
 - Modeling 1994 Plan with with older stormwater requirements

Can Off-Site Mitigation Offset Impacts?

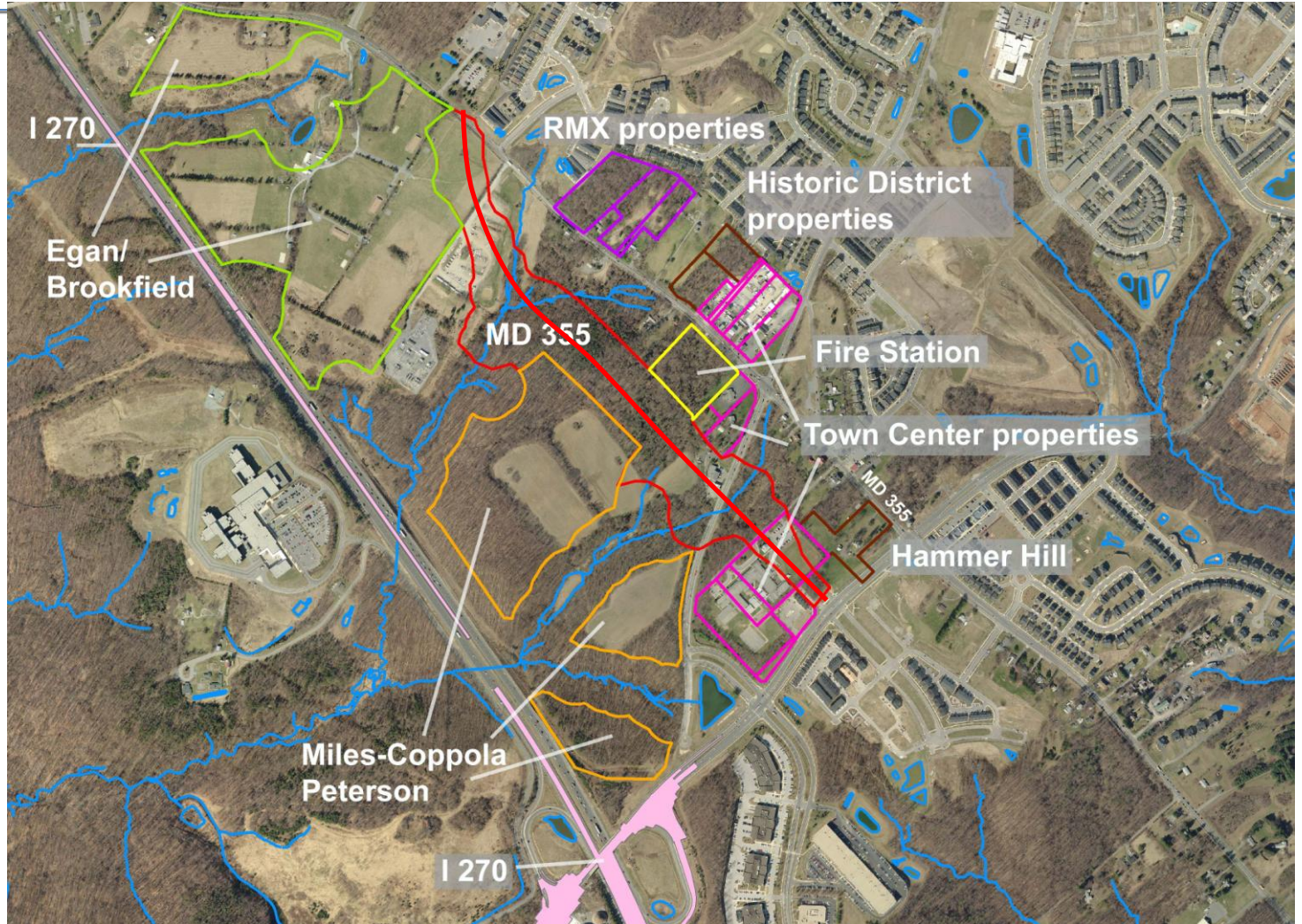
- All new development and redevelopment must incorporate ESD to the Maximum Extent Practicable
- Requiring larger, new development to address the legacy of older development would only relieve the owners of previously developed sites from the responsibility
- Roadway limitations on the potential for use of ESD
- Requiring reforestation to take place on rural properties would depend on the willingness of farmers to place easements on the land

Scenarios Under Evaluation

- ~~Scenario 1~~ – the 1994 Plan with previous assumptions
- Scenario 2 - Re-model the 1994 Plan with full development and changed assumptions
 - Two lanes added to I-270 with traditional stormwater
 - Development of rural-zoned properties
 - ESD on redevelopable properties in Historic District
 - New ESD assumptions
- Scenario 3 – Model the reduced footprints for Pulte with changed unit mix and the County-owned site with 355 Bypass realigned
- Scenario 4 – Model Scenario 3 with a reduction in density on Pulte to achieve the same unit mix as 1994 plan

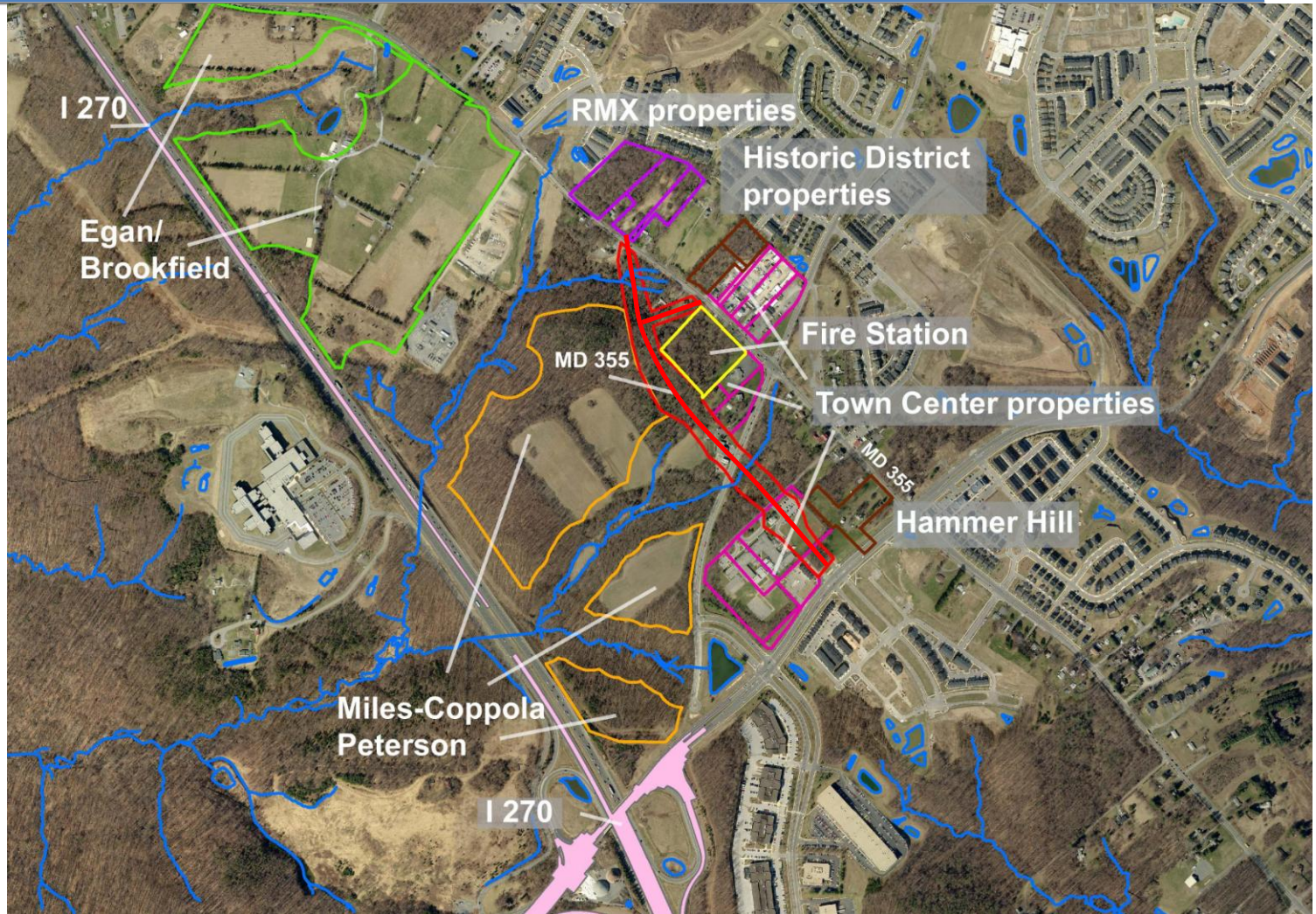
Scenarios to be Evaluated

Scenario 2



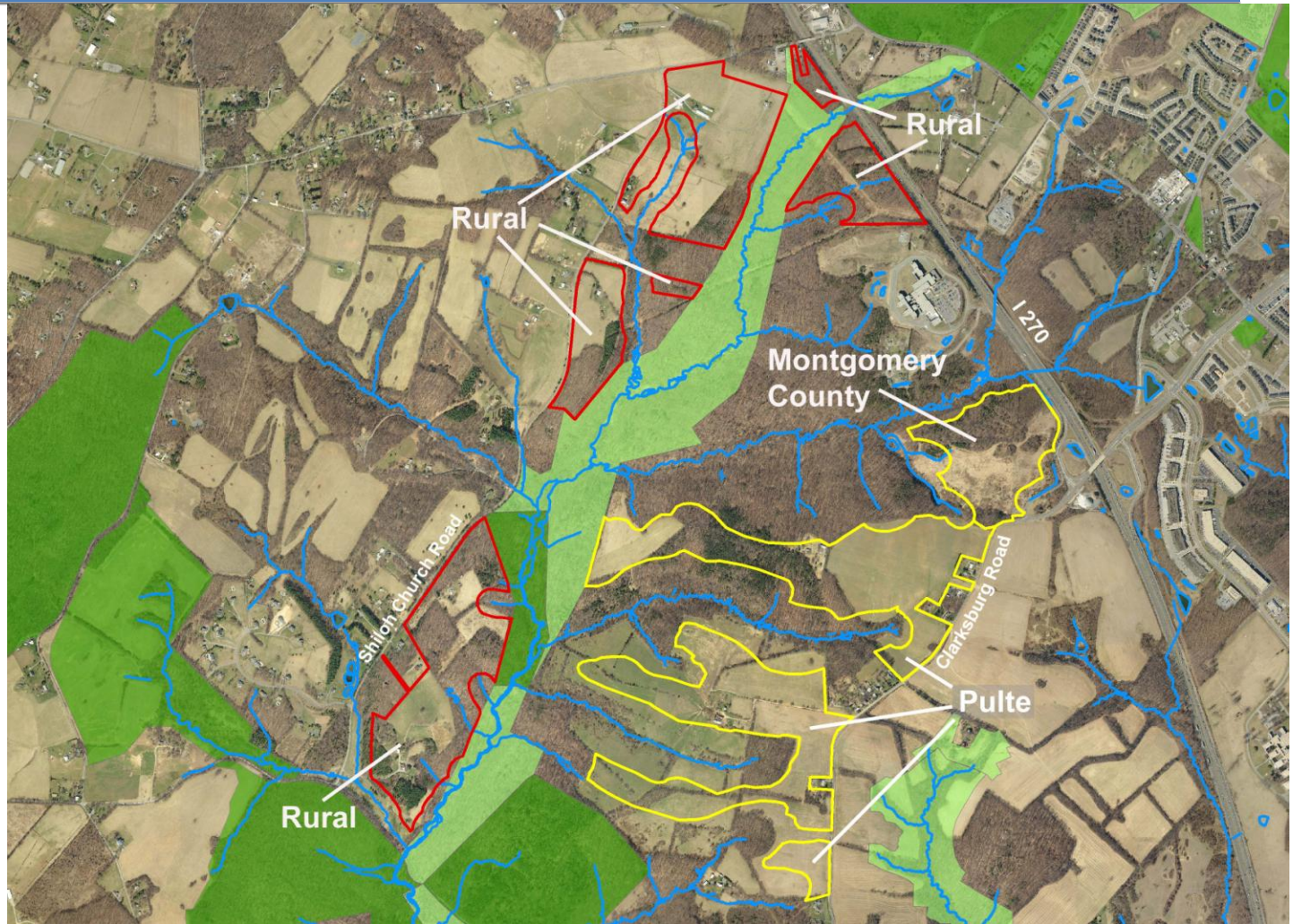
Scenarios to be Evaluated

Scenarios 3 and 4



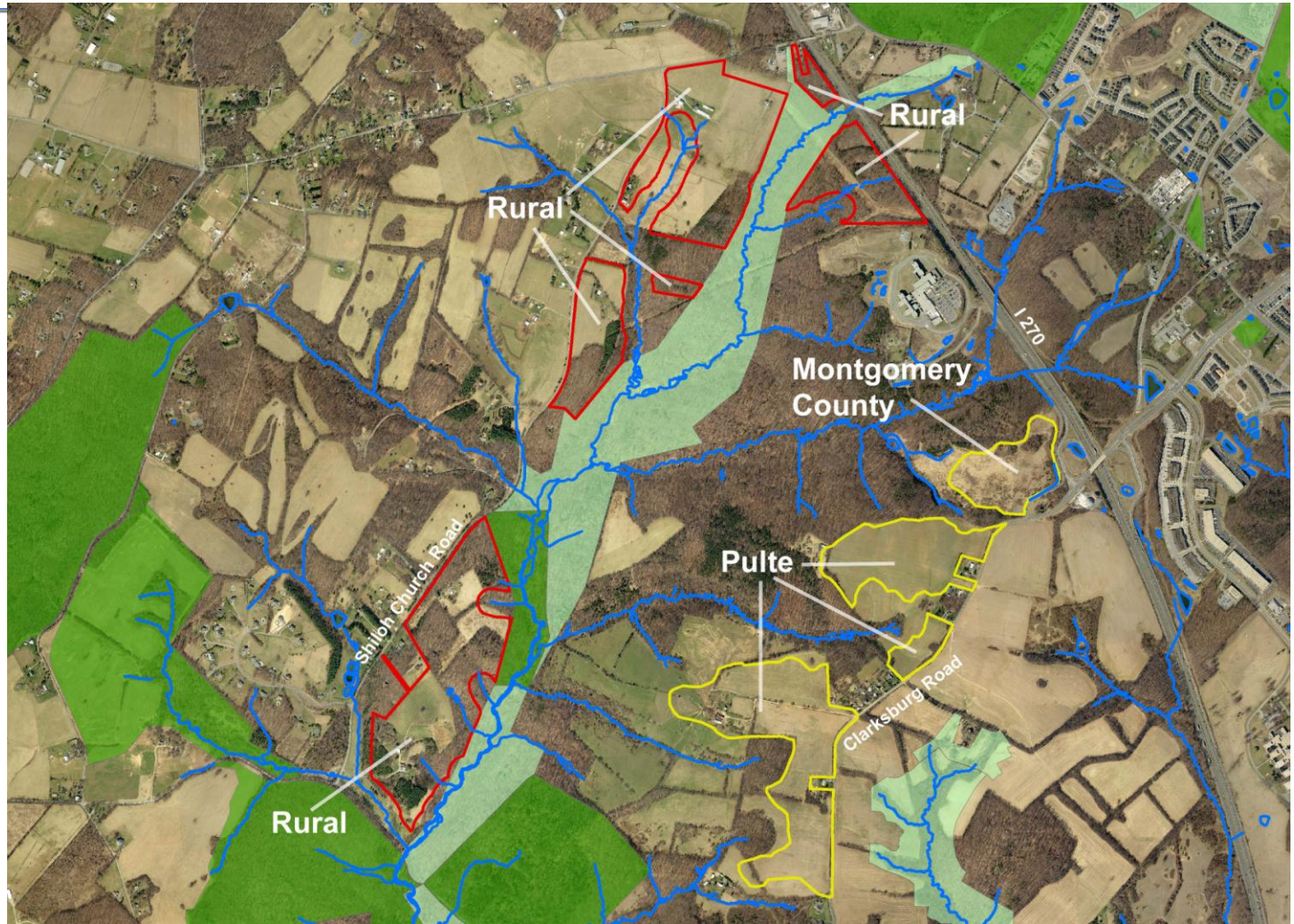
Scenarios to be Evaluated

Scenario 2



Scenarios to be Evaluated

Scenarios 3 and 4



Approximate Imperviousness of Proposed Scenarios

Scenario	Description	Pulte	County	Fire Station	Miles/ Coppola	Egan	355 Bypass	1270	Rural	Resulting Watershed Imperviousness
		Impervious Acres Associated with Development								
1	1994 Plan (as previously modeled)	67.2	19.0	1.5	25.5	30.8	11.7	Existing	Existing	8.8%
2	1994 Plan Revised (with added development)	67.2	19.0	1.5	25.5	28.5	11.7	3.6	13.30	9.3%
3	Reduced Footprint at 1994 Density	47.6	10.2	1.5	29.4	30.8	7.8	3.6	13.30	8.5%
4	Reduced Footprint at Reduced Density	39.3	10.2	1.5	29.4	30.8	7.8	3.6	13.30	8.3%



10 Mile Creek Area
Limited Amendment

Can We Maintain This in Ten Mile Creek?

