Clarksburg Ten Mile Creek Sewer Study

Report to the Montgomery County Planning Board

May 26, 2016

Agenda

1. Background
2. Citizens Advisory Committee Process and History
3. Sewer Study Alternatives
4. Other Issues
5. Business Case Evaluation
6. WSSC Recommendations
    1. Recommended Alternative
    2. Next Steps

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Background

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Clarksburg Master Plan and Related Amendments and Resolutions

- Council Resolutions 17-1048 and 17-1167 (2014)
- Planning Board Adopted Limited Amendment to the 1994 *Clarksburg Master Plan and Hyattstown Special Study Area* (2014)

Master Plan Recommendation:

'preserve natural resources critical to the County's well-being'

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Clarksburg Master Plan Water and Sewer Planning/Implementation

- Water and sewer service recommended for Development Stage Area 4 in the limited master plan amendment (LMPA)
  - LMPA also recommended that WSSC coordinate a comprehensive sewerage facility plan for the area to determine preferred alternative for sewer service (recommendation for sewer study was also incorporated into the sewer service category change amendments for the Ten Mile Creek properties).
  - East and West Environmental Overlay Zones
  - LMPA - Rezoning of properties
  - Special Protection Areas/Legacy Open Space Program

- Previous WSSC study – *Clarksburg Stage 3 and 4 Area Facility Plan, Final Edition* by Rodgers Consulting (December 2004).
  - Facility plan focused on service to the Development Stage 3 Area (now known as the Cabin Branch and other properties) of the Master Plan
  - Stage 4 was briefly examined but sewer service options were only conceptual due to Stage 4's dependence on Planning Board action for water and sewer service, following criteria as set in the 1994 Master Plan (e.g.: water quality monitoring).
  - Sizing of Stage 3 sewer infrastructure in 2004 study required examination of Stage 4 Area conceptual development
  - CIP alternatives for the Development Staging 3 Area were coordinated with Montgomery County Planning Department (M-NCP&PC) and Montgomery County Department of Environmental Protection (MCDEP) staff

Study Limitations

- Only considered “major” infrastructure to serve the Ten-Mile Creek and Historic Clarksburg areas
- Did not include all required ‘local’ sewers
- Detailed development/site plans for the major properties not yet finalized
- Site-specific infrastructure plans may have to be refined some as development progresses

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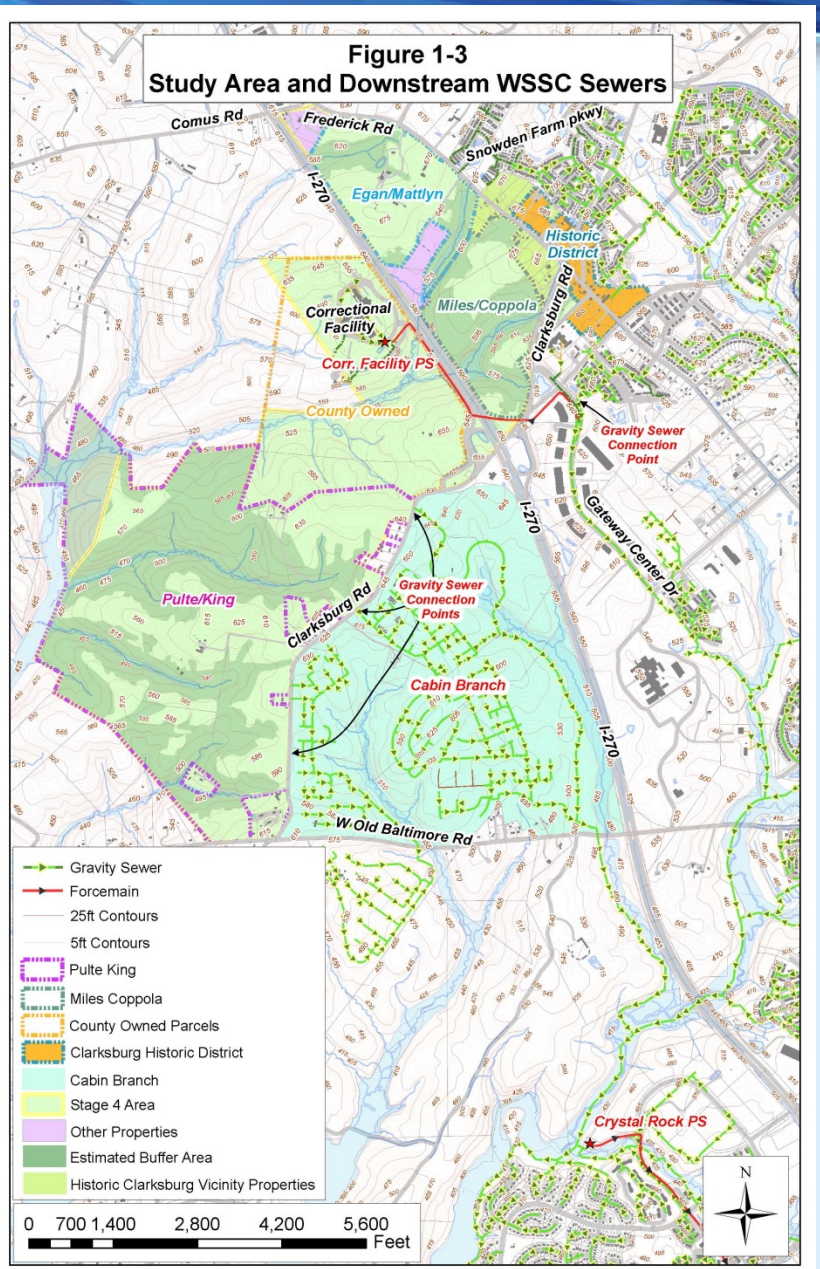
Existing WSSC Facilities

- Gravity sewers in Cabin Branch Development sized to convey wastewater from Stage 4 Development Area
- Wastewater conveyed to Crystal Rock WWPS, which then pumps to Seneca WWTP
- Major WSSC sewer facilities in the area have sufficient capacity to handle all wastewater from development in study area
- Existing WSSC pump station serving County Correctional Facility – pumps wastewater to gravity sewers on Gateway Center Drive (East of I-270) using an existing tunnel under I-270



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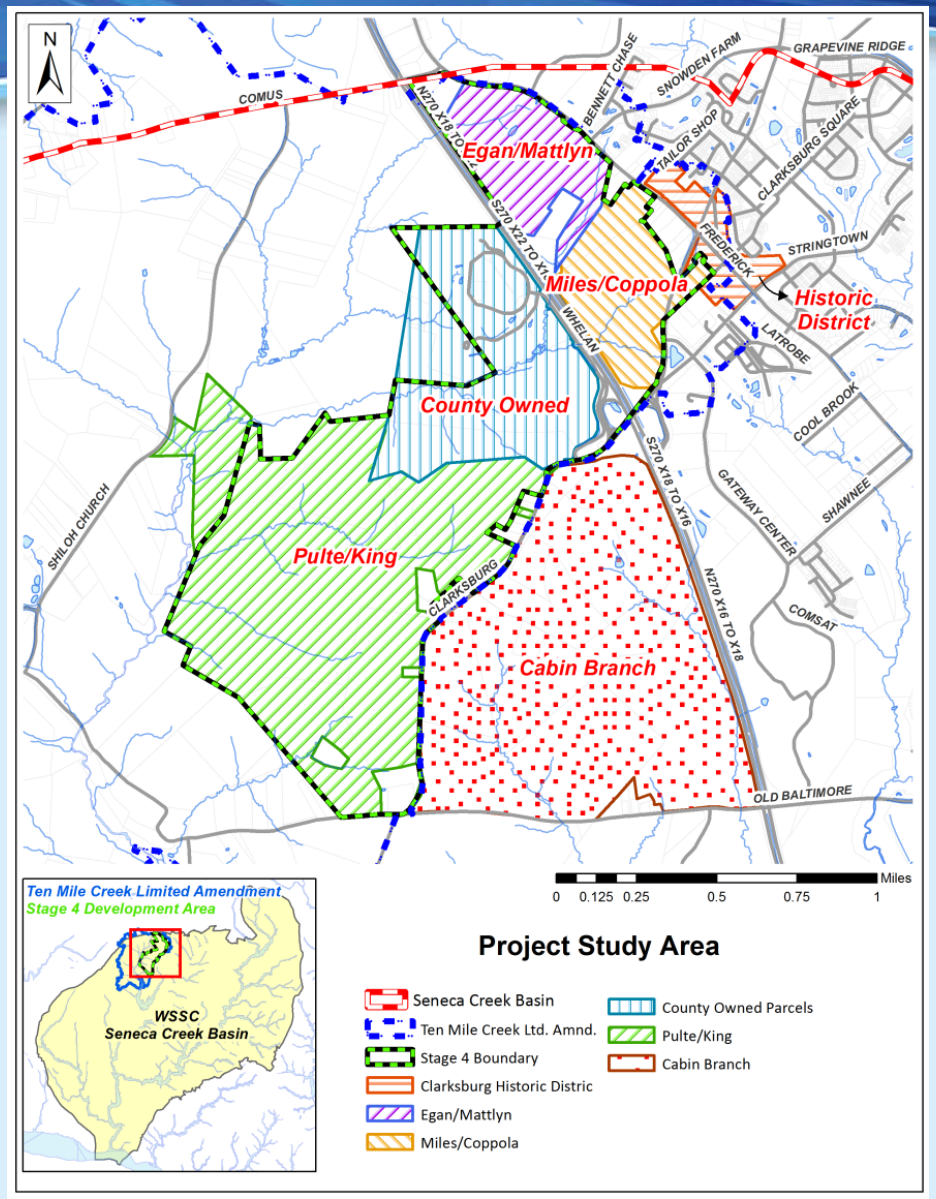
Properties of Significance in the Study Area

- Egan/Mattlyn
- Miles/Coppola
- Pulte/King
- County-owned property (Site of Montgomery County Correctional Facility)
- Historic District
- Additional property north of Egan/Mattlyn



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Clarksburg Historic District

- Sewer infrastructure facility plan evaluation also included service alternatives to the Clarksburg Historic District.
  - Strong interest expressed by the Planning Board and the County Council
  - Priority area for Montgomery County in seeking future public sewer service to this area due to issues with septic systems
- All sewer service alternatives in sewer study address service to the Clarksburg Historic District (due to existing septic system conditions).
- WSSC expressed to the County Executive's office (11/26/2014 correspondence) that
  1. Preferred location of wastewater pumping station for the Miles property would include service to the Clarksburg Historic District.
  2. WSSC would work with the County to include the pumping station in its CIP.
  3. WSSC would design and construct the pump station, provided SDC funding is available.
- Reiterated in March 25, 2016 letter from WSSC GM/CEP to County Executive, Council, and Planning Board that WSSC is committed to building this pumping station.

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Citizens Advisory Committee – Process and History

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Citizens Advisory Committee - Members

Bette Buffington	Buffington Properties/Historic Clarksburg
Stephen Carpenter	Historic District/Boyds
Jay Cinque	Boyds Civic Association, Sugarloaf Citizens Association, Friends of Ten Mile Creek
Stephen Collins	Pulte Group
Bob Egan	Audubon Naturalist Society
Scott Graham	Upcounty Citizens Advisory Board
Phil Isaja	Soltesz
Anne James	Friends of Ten Mile Creek
Michael Norton	Norton Land Design, Monacco Exclusive Renovation LLC
David Stein	Clarksburg Chamber of Commerce
Cathy Wiss	Audubon Naturalist Society

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Citizens Advisory Committee – Purpose, Process and Meeting Format

- Representatives of community, environmental, and development interests. Non-voting committee. Representatives from the Montgomery County DEP, Planning Department, Parks Department, Council, and Executive's Office (Regional Center) were present and contributed in the discussions held at CAC meetings.
- Review of Sewer Infrastructure System Alternatives to provide sewer service to the areas envisioned to be served by public sewer in the TMC-LMPA.
- WSSC was asked to respond to proposed alternatives and mitigation options for feasibility of implementation, followed by CAC discussion. Input was obtained from Montgomery County Department of Environmental Protection (DEP) regarding environmental impacts to County resources and recommended revisions to sewer alternatives. Once all feasible options evaluation and discussed, WSSC proposed draft sewer infrastructure plan. Plan was be provided to CAC for review and comment. WSSC completed a final draft plan with documentation of CAC input in the plan.
- 12 alternatives were ultimately reviewed and vetted by the CAC. Final draft plan, with CAC meeting summary documentation and CAC input included, was forwarded by WSSC to the Montgomery County Planning Board and County Council for briefings.
- **Meetings held from December 17th 2014** – Initial Public Meeting held at Rocky Hill Middle School, Clarksburg (5 initial alternatives/concepts introduced) to **September 24, 2015**. Meetings from February to September 2015 were held at the Upcounty Regional Services Center, Germantown.
- Planning Board Briefing, Silver Spring – **January 15th 2015** – and Montgomery County Council Transportation and Environment (T&E) Committee Worksession, Rockville – **February 5th, 2015.** Briefing held at WSSC on **February 20th, 2015** for State Delegation Representatives and WSSC Commissioners
- Working Draft report completed and submitted to the CAC for further input and comment – **October 30, 2015.** CAC comments received – **December 2015**
- WSSC recommendation memo transmitted to WSSC General Manager – **March 3, 2016.** Letters from WSSC General Manager sent to County Council, County Executive's Office, and Planning Board – **March 25, 2016**

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Overall Review of Sewer Study Alternatives

(Note: study alternatives 1 and 2 involved extensive lengths of gravity sewer through streams and environmental buffer areas of the Ten Mile Creek LMPA and were eliminated from further consideration)

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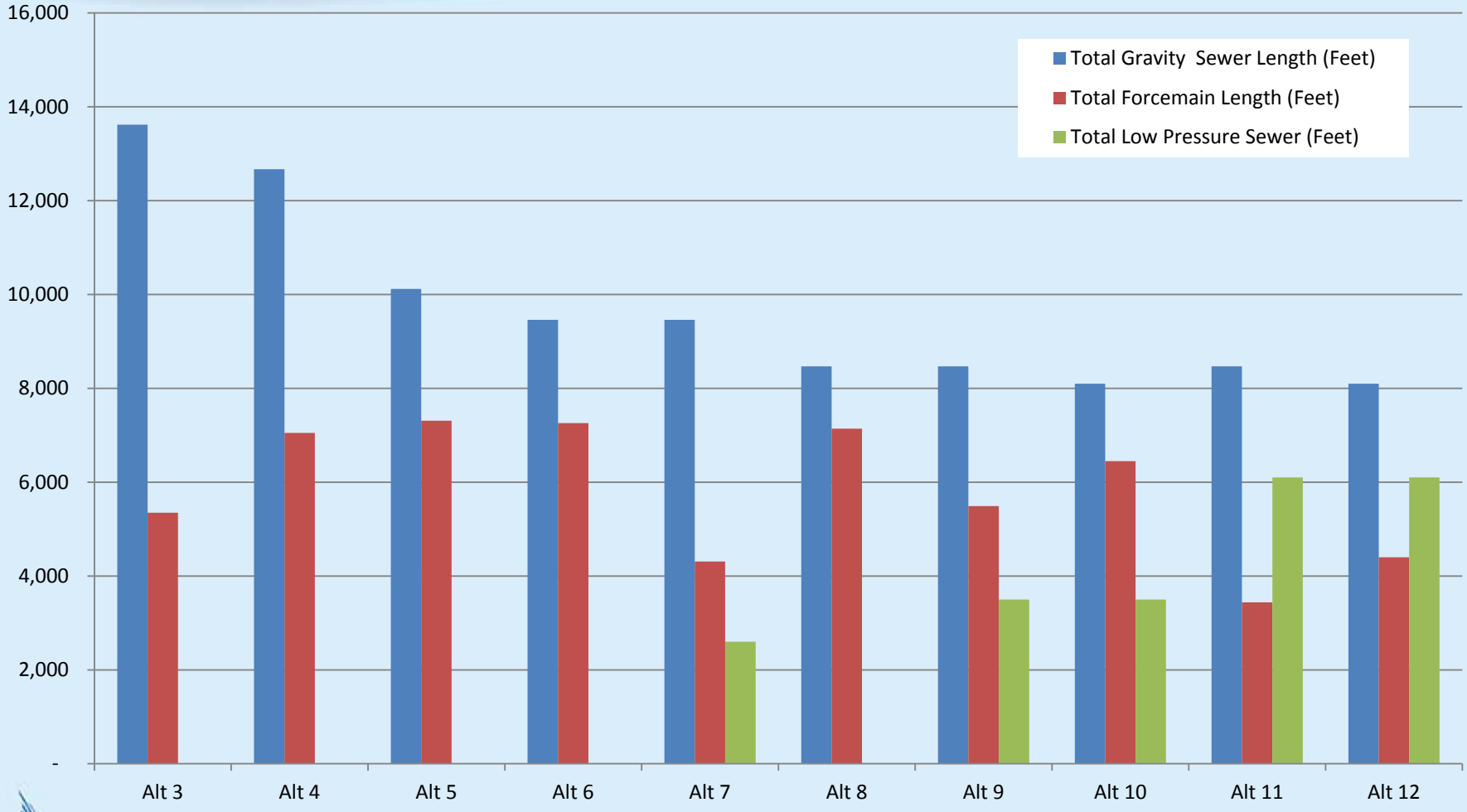
Summary – Sewer Lengths



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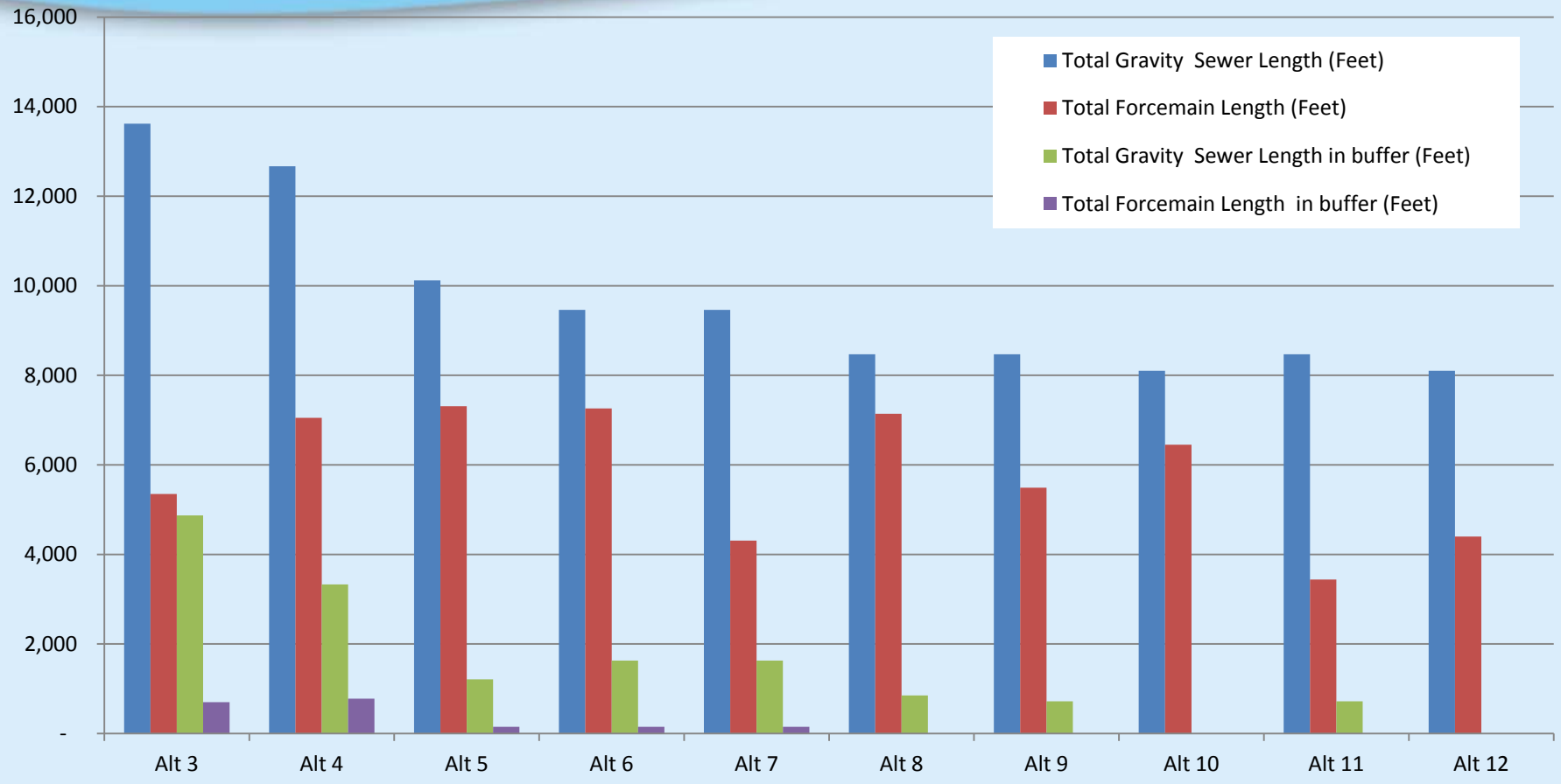
Summary – Sewer Lengths in Buffers



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Summary – Stream Crossings

Alternative	Description	Total No. of Stream Crossings
Alternative 3	Gravity + 3 PS	14
Alternative 4	Gravity + 4 PS	13
Alternative 5	Gravity + 5 PS	7
Alternative 6	Gravity + 6 PS	9
Alternative 7	Gravity + 4 PS + GS	9
Alternative 8	Gravity + 5 PS	7
Alternative 9	Gravity + 4 PS + GS	6
Alternative 10	Gravity + 4 PS + GS	3
Alternative 11	Gravity + 3 PS + GS	6
Alternative 12	Gravity + 3 PS + GS	3

Note: Includes ephemeral streams

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Summary – Number of Pump Stations

Alternative	Description	Total Number of Pump stations in service
Alternative 3	Gravity + 3 PS	3
Alternative 4	Gravity + 4 PS	4
Alternative 5	Gravity + 5 PS	5
Alternative 6	Gravity + 6 PS	6
Alternative 7	Gravity + 4 PS + Grinder Systems	4
Alternative 8	Gravity + 5 PS	5
Alternative 9	Gravity + 4 PS + Grinder Systems	4
Alternative 10	Gravity + 4 PS + Grinder Systems	4
Alternative 11	Gravity + 3 PS + Grinder Systems	3
Alternative 12	Gravity + 3 PS + Grinder Systems	3

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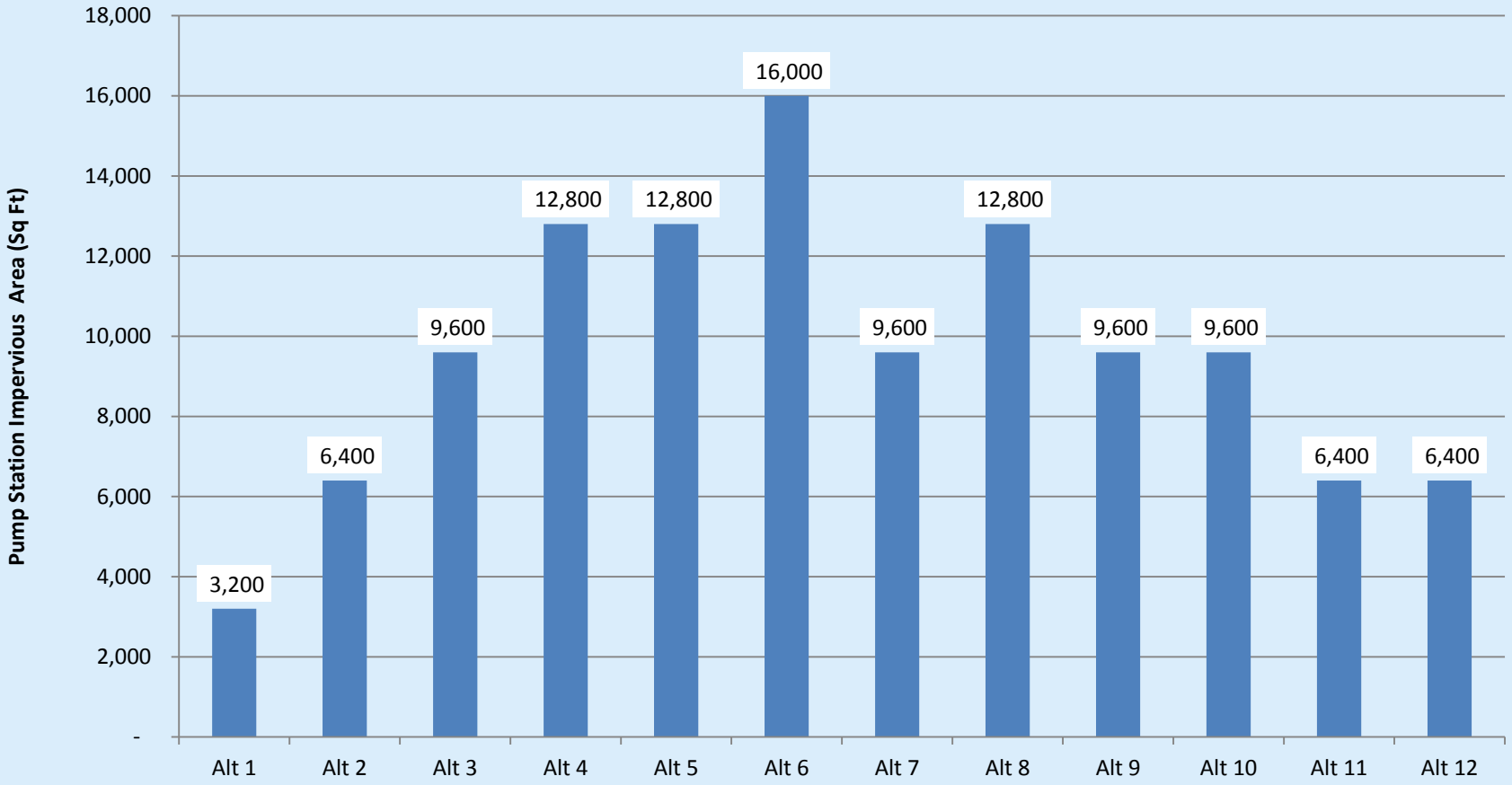
Summary – Impervious Area for Pump Stations (Note Alternatives 1 and 2 were eliminated from consideration)



Assumes 3,200 square feet per wastewater pumping station

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Additional Issues

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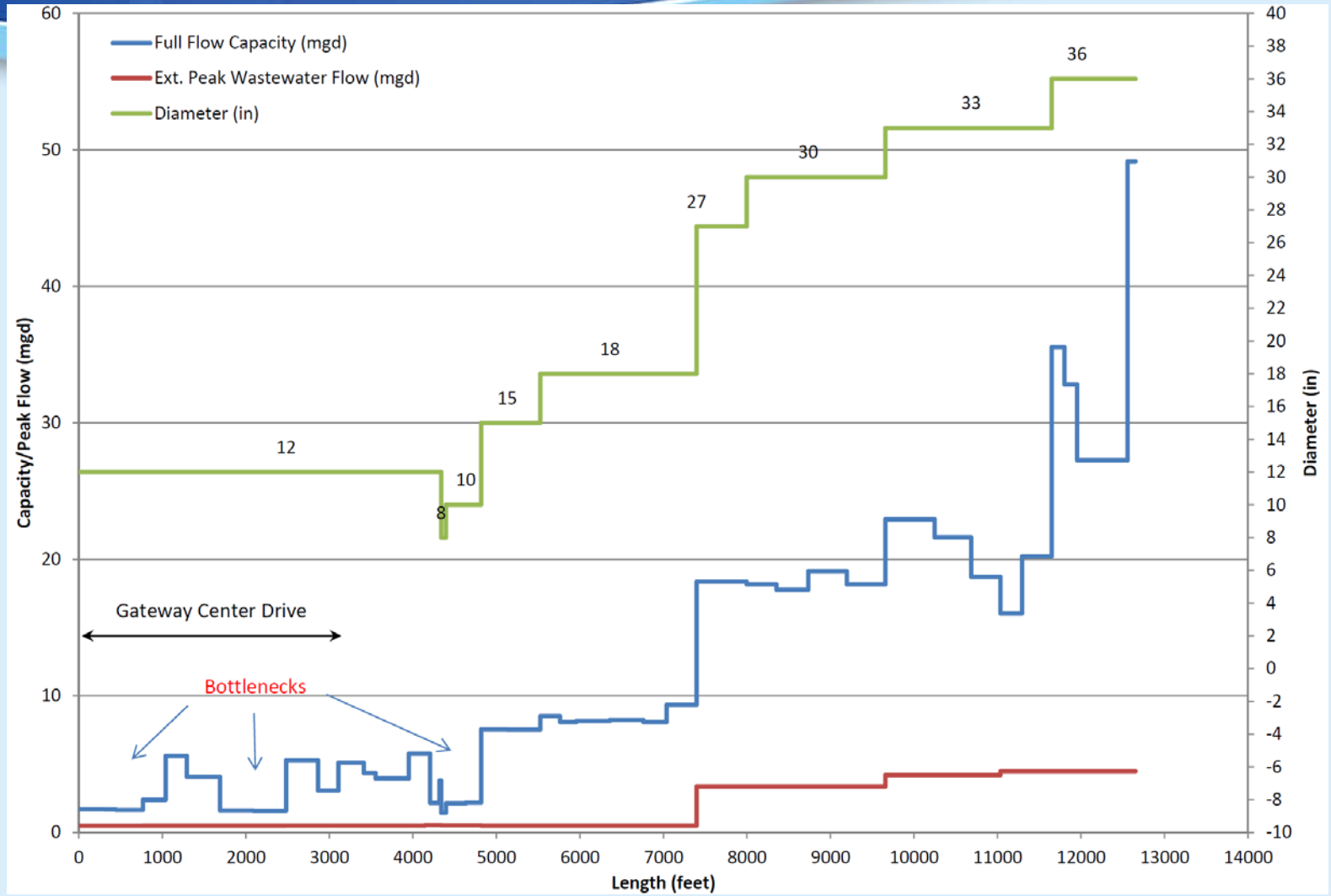
Capacity of Gravity Sewers on Gateway Center Drive



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Force Main Design Requirements

- Concern regarding force mains failure and associated SSOs were addressed by WSSC at the CAC meetings following last year's significant failures at the Olney WWPS's force main
- WSSC force main design guidelines already require an analysis to determine potential for Hydrogen Sulfide generation into proposed or existing sewers (Pomeroy's Equation).
- New design elements currently being considered:
  - Pipe Materials (HDPE, PVC, etc.)
  - Force main resiliency
- These measures are aimed at increasing reliability and extending the life of the pipes.
- New technologies and design guidelines will be adopted by WSSC after a careful and thorough internal analysis and business case evaluation.

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Alternative Systems

- Per inquiries from citizens, County Council, and Planning Board
- WSSC Standard Procedure/Policy (SP ENG 04-10) establishes preferred sequence of providing service to an area:
  - Gravity
  - Centralized Pumping
  - Low-Pressure/Grinder Systems

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Grinder Systems

- WSSC has extensive experience with Grinder Systems; currently properties is WSSD service area are served by over 2,000 grinder pumps (approximately 1,300 in Montgomery County);
- Most ‘systems’ of grinder pumps are limited to serve 50 and fewer homes. ‘Systems’ with grinder serving more than 50 homes are rare.
- As a result of WSSC’s experience with these systems, WSSC has adopted the following policies/guidelines for the use of grinder systems:
  1. Grinder systems limited to residential properties only;
  2. Non-residential properties require a dedicated unit;
  3. Must meet criteria related to odor potential
- Subject to technical limitations (e.g.: flow and pressure head)

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Grinder Systems vs. Centralized Pumping

- Grinder Pump/Low Pressure Systems - advantages:
  - Can be constructed at street grade with proper depth of cover (not as dependent on gravity/elevation)
  - Smaller diameter mains required (1¼ -inch to 2 inches diameter PVC; WSSC minimum design standard for gravity sewer = 8-inch diameter PVC or ductile iron if in stream crossing)
  - Pressure sewer cheaper to install than gravity sewer
  - Can be more cost effective than centralized pumping station particularly for less than 50 units

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Grinder Systems vs. Centralized Pumping

- Grinder/Low Pressure Systems - disadvantages:
  - In most cases, no redundant equipment (e.g. pumps and motors).
  - In most cases, no redundancy if power goes out.
  - Subject to hydraulic and pressure limitations
  - Owned and maintained by homeowner.
  - Monitoring and alarms can vary.
  - Odors can be difficult to control.
  - Operating pumps exceeding maximum number of pumps operating ‘as designed’ may cause operational and maintenance issues.
  - Compared to centralized gravity and pumping system, low pressure systems provide a lower level of service to the customer.

WSSC Grinder Systems Policy and Sewer Study Recommendations – Pulte/King

- WSSC staff (Technical Services Group) conducted preliminary evaluation (specific development plans – other than proposed development counts, locations of future parcels, etc. were not available) of grinder pump/low pressure concepts.
- The evaluation determined that pressure sewer may be feasible for the Pulte/King property due to the high densities proposed. The 'entire' sewer study area cannot be served by grinder pumps via WSSC Design Guidelines (e.g.: no 'downhill' pumping)
- Some mitigation may be required while the Pulte/King property builds out. WSSC staff recommends prohibition of gravity connection to a sewer extension along Clarksburg Road where the Pulte/King low pressure system would connect. This would allow some transition to the gravity system and avoid/mitigate any possible sulfide gas issues as the build out progress.
- Further design and review of the low pressure/grinder system for Pulte/King and other Ten-Mile Creek properties would be required as developments are submitted for WSSC hydraulic planning analyses (HPA). This would ensure these systems meet current WSSC Design Guidelines and Standards.

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WSSC Grinder Systems Policy and Sewer Study Recommendations (continued)

- Pulte/King property, as established by WSSC's Grinder Systems Policy and Procedure, can be feasibly served by a wastewater pumping station and force main, which WSSC feels would provide a higher level of service to its future customers served.
- WSSC, however, is willing to allow an exemption to this policy considering the LMPA established that sewer service alternatives minimize – as feasible – disturbance of and impact to environmental resources in the Ten-Mile Creek Area.
- Under WSSC's current recommendation, Alternative 12, the Pulte/King property is mostly served by gravity sewers draining to the nearby Cabin Branch development. However, one central area or 'pod' of development is served by a grinder pump/low pressure system.

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Business Case Evaluation

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Business Case Evaluation

- An ‘abbreviated’ Business Case Evaluation (BCE) was conducted by WSSC’s Asset Management Planning unit.
- The purpose of a traditional business case evaluation is to evaluate life cycle costs, risk, and level of service, but due to time constraints, only life cycle and risk were evaluated.
  - Lifecycle cost analysis – determines costs to design, build and operate and maintain over the life of the facility;
  - Risk absorption analysis – looks at additional risk WSSC would absorb associated with implementation of the alternatives.
- Alternatives 9 through 12, having the minimum stream crossings, were included in the BCE.

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Business Case Evaluation Results

- Alternative 12, having the highest annuitized net present value to WSSC and with Alternative 11 and 12 (for both with the Pulte WWPS) were tied for the lowest risk absorption to WSSC.
- However due to the large differences in annuitized value and the relatively small differences in risk absorption, Alternative 12 was the recommended alternative for execution by WSSC.

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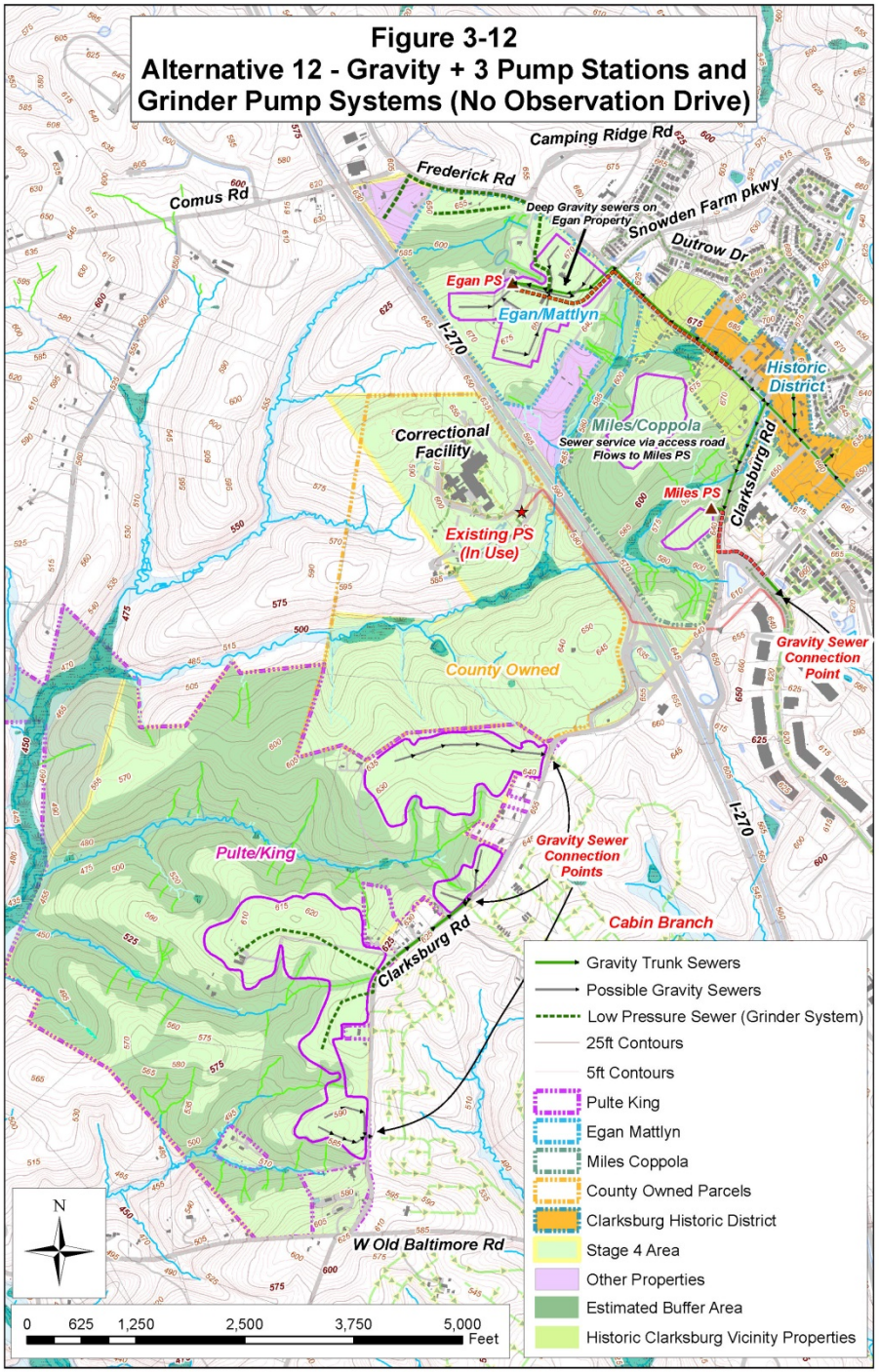
Alternative 12

- Miles/Coppola property served by gravity sewer discharges along a yet to be defined access road to the new development.
- New proposed Egan pump station
- New proposed Miles pump station
- Pump station at Correctional facility remains operational
- Total Low Pressure Sewer Length – 6,100 feet
- Total individual grinder pump units – 300
- Total Gravity Sewer Length – 8,100 feet
- Total Force Main Length – 4,400 feet
- Number of Pump Stations – 3
- New Tunnel Crossings under I-270 – None
- Estimated cost - $9,115,000 ($2,119,000 O&M, $6,996,000 Capital)
- Stream crossings - 3

WSSC 'Recommended' Alternative



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Next Steps

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Next Steps...Pending Planning Board and Council Action

- WSSC and County staff coordinate insertion of ‘Miles’ Wastewater Pump Station in WSSC’s Capital Improvements Program (CIP).
  - WSSC staff has already commenced Project Initiation (PIF) of this pump station.
  - Pump station will serve properties north of I-270 (Miles/Coppola, Egan/Mattlyn, additional properties north of Egan/Mattlyn in LMPA study area, and the Historic Clarksburg District
- Additional development and any other related CIP projects expected to proceed as development projects are submitted for review to WSSC/Montgomery County Planning Department/Montgomery County Department of Environmental Protection
  - Further analysis and review of specific development proposals may require additional coordination among these agencies (in keeping with the spirit of the LMPA and the findings of this sewer study)
  - Pulte/King can develop independently of the other Ten Mile Creek properties studied (pending current litigation and other issues)

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Questions/Discussion

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Ten Mile Creek Sewer Study Web Page at WSSC Web Site

https://www.wsscwater.com/business--construction/major-projects/ten-mile-creek--clarksburg-sewer.html

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