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1. Executive Summary

The *2002 Potomac Subregion Master Plan* recommended that Montgomery County conduct a sanitary survey to evaluate the general condition of the septic systems within the study area, determine the probability of continued reliability of these facilities and, if necessary, evaluate the feasibility of extending public sanitary sewer service to portions of the study area. The Department of Permitting Services, Well and Septic Section, has periodically raised concerns with the Department of Environmental Protection about septic system failures in the study area. In some cases, subsurface conditions do not allow for septic system replacements that satisfy current regulations. The project was conducted in two phases. The results indicated for Phase 1 in this report reflect the evaluation of existing conditions that may constrain areas for future use of deep stone trench septic systems.

This report presents the results of Phase 2 of the Glen Hills Area Sanitary Study. In the Phase 1 report, approximately 36 percent of the study area was potentially affected by constraints that could limit the long-term use of deep-trench septic systems, the type of septic system most commonly installed today for new construction and replacement systems.

The report presents an evaluation of options for providing sewage disposal to parts of the Glen Hills study area. As explained in the Phase 1 report, these are areas where the use of a conventional deep stone trench septic system for future on-site sewage disposal may be constrained by soil characteristics and regulatory requirements. These areas are identified in this report as Review Areas (RAs). Two options are presented for the purpose of wastewater disposal:

- On-site replacement of septic systems, including alternatives for both conventional systems (deep stone trench, shallow stone trench, and sand mound) and innovative systems (drip-disposal).
- Provision of public sewer service.

Upon completion of the two phases of the study, and following an opportunity for public comment, DEP will prepare a staff report addressing the study results to present to the County Executive. (The Phase 1 and 2 reports will be a part of this staff report.) Included with the staff report will be service policy recommendations for the study area for the Executive to endorse, as appropriate, and forward to the County Council for consideration as intended by the 2002 *Potomac Subregion Master Plan*. The Council will then decide what, if any, changes in service policy are needed for the study area and how those changes will be implemented.

On-site Sewage Disposal Systems

Based on previous data accumulated in Phase 1 of this report deep stone trench systems within the RAs may not meet today's septic regulations and could be difficult to construct within the RAs predominantly due to poor soil conditions including slow percolation rates, high ground water elevations and high bedrock elevations.

On-site septic systems replacements or expansions will require proper soil testing and evaluations to determine their suitability. With more detailed field soil testing some of the areas within the RAs may reveal better soil conditions than the preliminary data that the Phase 1 report based its delineation of the RAs. If areas within the RAs are found with moderate depths to groundwater or bedrock, shallow trench stone systems could be used as replacements systems in these areas where otherwise deep stone trench systems would not be viable.

Because sand mound systems are built over the existing ground without the need to excavate down into the ground, sand mound systems are better able to function in high ground water and high bedrock areas than stone trench systems. There are areas within the RAs with high bedrock that may be suitable for sand mound systems. Areas within the RAs with high groundwater also had poor percolation rates and therefore would not be suitable for sandmound systems.

Drip systems are innovative systems that are designed by a MDE certified designers who test soils and determine the allowable percolation rate on a case by case basis. Designers could design a system that functions in soils with slower percolation than the normally required 30 minutes per inch. Drip systems may be viable in areas with marginal percolation rates that would not normally be viable for a stone trench system.

Planning level estimates and the associated costs were generated for each option to serve the existing septic systems potentially affected by the conditions in the RAs. The average costs for replacing the 197 septic systems within the RAs ranges from $17,500 to $48,000 for each property depending on the type of on-site sewage disposal system.

Public Sewerage Systems

Existing public sewer service within the study area is provided primarily by the Washington Suburban Sanitary Commission (WSSC). The City of Rockville provides sewer service to properties located within the city limits along the northeastern edge of the study area. The City's sewerage system feeds into WSSC's Watts Branch sewerage system, the flows from which are treated at the Blue Plains regional wastewater treatment plant in Washington, D.C.

Conceptual public sewer service extension plans were developed to prepare a comparative cost analysis. Sewer main alignments were located within the public roadways and avoided environmentally sensitive stream valleys. The alignments maximized the usage of gravity systems and minimized pump station and pressure lines. The conceptual alignment also avoided the need for any easements from private land owners.

Conceptual alignments were developed for thirteen separate sewer extension systems. The systems included both gravity and pressure main line pipes. Each applicant will require a connection from the existing house to the main line pipe in the road. These connections could be a gravity system or a pump system depending on the topography. To obtain public sewer service several steps are needed. These include a service category change from Montgomery County, which typically takes nine to 15 months from the time of application, and an extension application process through WSSC, which takes four to ten months from the time an engineer is selected for system design to receiving a permit.

Planning level cost estimates for providing public sewer service to relieve a failed septic system typically exceed those estimated for using a replacement septic system (see above). Sewer main extension costs rise dramatically the further a property is located from the existing public sewerage system.

Exceptions only occur where a property already has access to an existing sewer main. To connect a single property to an available public sewer main will cost an estimated $23,000 to $32,000. The construction of new sewer mains for properties that lack direct access to existing sewer mains starts at an estimated $20,000 to $80,000 for each pair of lots along a street that a new main passes by.

2. Introduction

The *2002 Potomac Subregion Master Plan* recommended that Montgomery County conduct a sanitary survey to, "develop the measures necessary to ensure the long-term sustainability of septic service for new home construction and existing home renovations, and to address the need for limited sewer extensions if needed." The entire text of the master plan's recommendations for the Glen Hills area study is included in Appendix 2 of the Phase 1 report. The study was conducted in two phases. The Phase 1 portion of this study has been completed and consisted of the evaluation of existing conditions that potentially constrain areas for future septic system use. The study is to a preliminary level, using only available data and documentation as its basis for the study. It was conducted for planning purposes and did not include a lot by lot investigation or analysis.

The study area is located southwest of the City of Rockville and consists of 542 properties located within several existing subdivisions. (See Figure 2.1, pg. 6). This report collectively refers to these properties as the "Glen Hills study area" or the "study area." Most of the properties are improved with single-family homes, and of these, most are currently served by on-site septic systems. Most of the properties were built 30 to over 60 years ago. Properties at the northeast edge of the study area, along Viers Drive and Scott Drive, are located either within the City of Rockville or within the City's planned public sewer service area.

2.1 Summary of Phase 1 Findings

The Phase 1 report of the Glen Hills Area Sanitary Study, dated August 2012, contains data that was gathered and assessed to evaluate the potential for sustained use of septic systems within the study area. The sources and evaluation of data collected are presented in Sections 3 and 4 of the Phase 1 report and included:

- Well and septic permit records research at Montgomery County Department of Permitting Services (MCDPS)
- General GIS data from Montgomery County Department of Environmental Protection (MCDEP) providing both area and property-specific analysis
- GIS soils information from U.S. Department of Agriculture Natural Resources Conservation Service website
- Property owner surveys conducted as part of this study
- Public meetings
- Glen Hills Study Citizen advisory committee
- Interviews with MCDPS Well and Septic Section staff
- Review of current soil testing requirements and permit regulations for septic systems

Due to the preliminary nature of the report and available funds, the report did not include the lot-by-lot field soil testing that is normally required when designing, permitting and constructing sanitary systems. Only with this type of soil testing can there be certainty regarding the long term sustainability of septic service on individual properties.

Those data evaluated include:

- system age
- streams and floodplains
- topography and steep slopes

- depth to groundwater
- depth to bedrock
- percolation and permeability rate
- USDA restrictive soils classifications for septic fields
- system failures and replacements.

By evaluating, mapping and compiling the preceding eight parameters, a map (see Figure 2.2, page 6) was prepared to indicate portions of the study area where the relief of existing, aging septic systems may require alternatives to the long-term use of conventional, deep-stone trench septic systems. The findings of the Phase 1 report showed that these areas, referred to here as Review Areas (RAs), comprise approximately 36 percent of the total study area. Given the extent of the RAs, the Phase 1 report recommended proceeding with Phase 2 of the study to consider wastewater disposal alternatives for the RAs, which included conventional and innovative septic systems and the provision of public sewer service.

Note that as a planning level study, the identification of RAs presented here is based in part on theoretical information about soil conditions within the study area. Depending on the results of County-regulated, on-site septic testing, some properties within the RAs may be suited for deep trench septic systems. Conversely, not every property located outside of an RA can be guaranteed for the long-term use of deep trench systems until testing is completed.

2.2 Phase 2 Study Goals and Objectives

The goal of Phase 2 of the Glen Hills Area Sanitary Study is to identify and evaluate possible sewage disposal options for the Review Areas (RAs) indentified in Phase 1. Within the RAs soil conditions and regulatory requirements may impede the future use of deep-trench septic systems as replacements for, or expansions of, existing septic systems. The primary objective is to consider replacement service for long-term use for existing, improved properties. However, in keeping with the 2002 master plan's recommendations, property owners could also use these alternatives, as appropriate, to replace or enlarge existing homes.

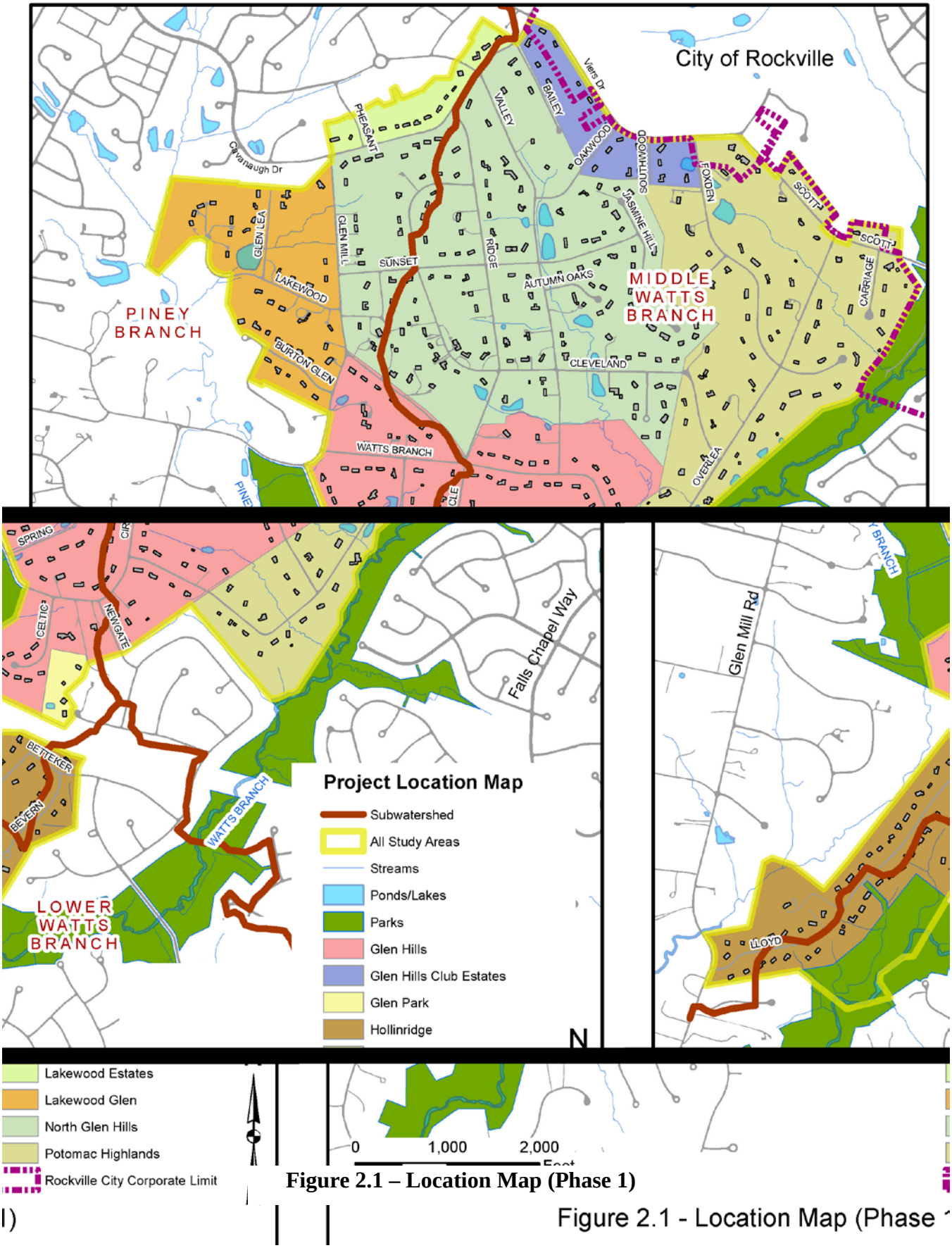


Figure 2.1 – Location Map (Phase 1)

Figure 2.1 - Location Map (Phase

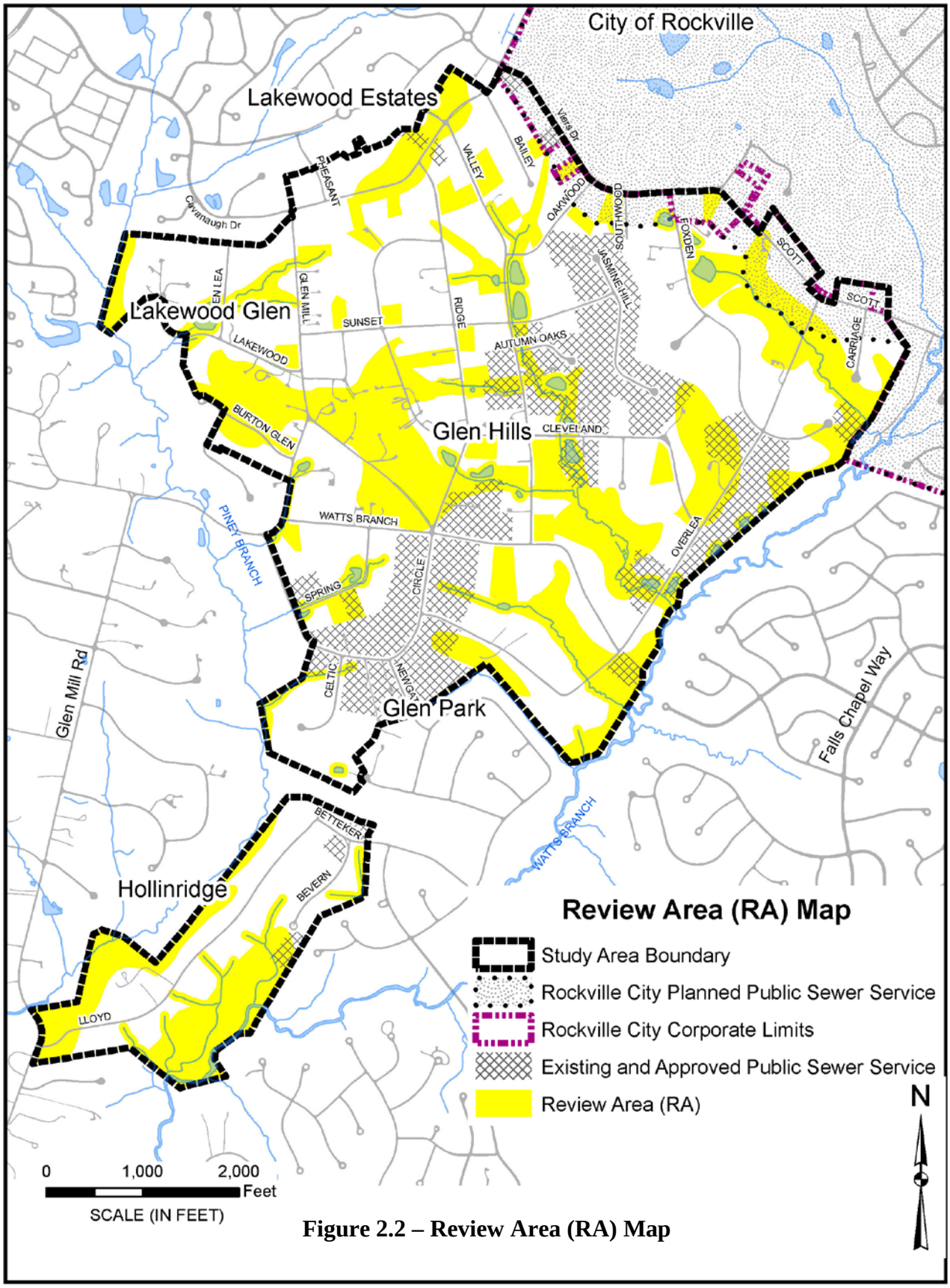


Figure 2.2 – Review Area (RA) Map

3. General Description of Options

The 2002 master plan requires the consideration of two options for the safe disposal of domestic sewage for the homes located within the study area. The first option uses on-site sewage disposal by one of the septic treatment methods currently accepted by Montgomery County Department of Permitting Services (MCDPS) as described in the Phase 1 report as well as in the following description (see Section 3.1). The ownership, operation and maintenance of these on-site treatment systems is the responsibility of the property owner. The second option uses a public utility to collect and then treat sewage at a central wastewater treatment facility. The design, construction, operation, and maintenance of the public sewerage system throughout the majority of the study area are the responsibility of the Washington Suburban Sanitary Commission (WSSC). For properties located along the northeast edge of the study area, these functions are the responsibility of the City of Rockville (see Figure 2.1 above).

3.1 On-Site Sewage Disposal Systems

On-site systems are typically named by the type of drain field absorption method. The three types of on-site sewage disposal systems accepted by MCDPS are:

- Stone Trenches (deep trench and shallow trench) are installed entirely below grade and utilize gravel fill to surround a perforated pipe covered by soil.
- Sand Mounds are elevated above the natural grade in a sand fill material.
- Drip Disposal uses flexible small perforated tubing to disperse wastewater below ground to the native soil.

Typical components on-site disposal systems are noted below. Additional detail may be found in Section 4.2 of the Phase 1 study as well as Section 4.1 in this study.

Septic System Components: A typical septic system has three main components: a septic tank, a distribution system, and a drain field. Each of the components has a specific function, as follows:

Septic Tank: The septic tank consists of a watertight container that accepts wastewater from the house. The tank design allows for the settling of solids from the wastewater; these solids need to be cleaned out periodically, once every three to five years. The remaining wastewater effluent flows from the tank into a distribution system. The tank provides initial and/or secondary treatment to the wastewater.

Distribution System: The partially treated wastewater is conveyed in pipes from the septic tank and distributed to the drain field for further treatment.

Drain Field: The drain field distributes the wastewater for further treatment into the soil beneath the drain field. The drain field, also known as a soil absorption field, consists of one or more perforated pipes in trenches of gravel, sand mounds, or in the case of drip systems, native soil. The wastewater continues to flow from the perforated pipes through the drain field, where it percolates into the soil which provides final treatment.

3.2 Public Sewerage Systems

The collection of wastewater in a public sewerage system is accomplished by using both gravity sewers and pressure sewer systems to direct wastewater to a central treatment facility:

- Gravity sewerage systems are constructed so that sewage flows downward through the sewer mains towards a wastewater treatment plant. Typically, the slopes of the sewer mains mimic the downward slope of the ground above them. WSSC requires a minimum pipe diameter of 8 inches for gravity sewers for maintenance purposes. Houses usually connect to gravity sewer mains by means of a 4-inch diameter gravity connection that runs from the lowest level of the house down to the public main, typically buried eight to 15 feet below ground (street level). In a few cases, where the lowest level of the house is below the elevation of the abutting sewer main, an on-site pump is used to pump sewage flows up into the gravity main at the street.

- Pump/pressure sewerage systems use on-site, electric-powered pumps to pump wastewater through a relatively small-diameter, low-pressure sewer main (typically a 1-1/2-inch to 3-inch diameter pipe) until it intersects with and discharges to a gravity sewer. Although WSSC and Rockville generally prefer the use of gravity systems, these sewerage systems are typically employed where the use of gravity sewers is not advisable due to the extreme length of gravity extensions needed to reach other existing mains or due to environmental constraints along a proposed gravity sewer alignment (wetlands, sensitive ecologies, etc.) that could preclude sewer construction. An advantage of pressure systems is that they allow sewer mains to function in areas where gravity services are limited or restricted. A disadvantage to the pressure system is that it depends on on-site pumps that require power and periodic maintenance.

A more detailed discussion of the types and costs of systems, criteria and the process for system selection may be found in Section 5.

4. On-Site Sewage Disposal Systems

This section addresses the *2002 Potomac Subregion Master Plan's* direction to "… develop the measures necessary to ensure the long-term sustainability of septic service for new home construction and existing home renovations, …" in the study area. It presents and evaluates several types of septic systems as possible on-site alternatives to deep stone trench systems for the replacement of existing septic systems in the Glen Hills Study Review Areas (RAs).

4.1 Options for On-Site Systems

There are four types of on-site sewage disposal systems currently accepted by Montgomery County Department of Permitting Services (MCDPS) for on-site sewage disposal systems. These include:

- Deep Stone Trenches
- Shallow Stone Trenches
- Sand Mounds
- Drip Disposal

Stone trenches and sand mound systems are considered conventional systems by the County and can be used for new house construction, existing house expansions and replacement of existing, failed septic systems. Drip systems are considered innovative and can only be used as replacement systems where conventional systems cannot be approved.

Each of these four types of septic systems may be capable of replacing an existing septic system within the review areas (RAs). Some of these systems may provide a better likelihood of being permitted and functioning successfully in certain soil conditions than others and will be described in more detail below. Note that within the RAs, natural conditions and permitting regulations may be more likely to constrain the use of deep trench septic systems.

4.2 Testing and Permitting Requirements for On-Site Systems

Improvements to or replacement of existing septic systems would be considered on a case-by-case basis. Field testing would be required to determine specific site conditions such as groundwater levels, percolation rates and depth of bedrock before any decision can be made about the type and size of septic system suitable for a specific site. The proposed septic field areas would also require evaluations regarding setback requirements, available reserve area, and slope of ground.

MCDPS issues permits for conventional systems (deep trench, shallow trench and sand mound systems) provided that permitting requirements (reserve areas, percolation rates, and depth to water table and bedrock, etc.) are satisfied. Conventional septic systems can be permitted for both new house construction and substantial additions for existing houses. If conditions do not allow for needed reserve areas, permits for conventional septic systems may carry restrictions on the future use of the property. MCDPS requires these restrictions to help ensure safe operation of the existing system; the restrictions typically limit the size of additions to and the use of existing buildings. MCDPS classifies drip disposal systems as innovative systems, not conventional systems. Drip systems are used only as replacements for existing septic systems. Accordingly, permits for drip systems may also carry restrictions on the future use of the property.

Table 4.1 below presents a comparison of design criteria, guidelines and sizes of drain field footprints for different systems.

Table 4.1 – Comparison of Septic System Types

Septic System Design and Permitting Criteria	System Type			
	Deep Stone Trench	***Shallow Stone Trench***	***Sand Mound***	***Drip Disposal***
Percolation Rate (minutes/inch)	2 to 30	2 to 30	5 to 60	-- [A]
Typical Depth of Disposal Installation (ft.)	4 to 11	3 to 6	-- [B]	1 to 2.5[C]
Depth of Water Table from bottom of septic system (ft.)	4	4	2	4
Depth of Rock Fragments from bottom of septic system (ft.)	4	4	2	4
Distance from Water Well (ft.)	100	100	100	100
Distance from body of water & intermittent stream (ft.)	100	100	100	100
Distance from lot line/easement (ft.)	5	5	5	5
Distance from structure (ft.)	20	20	30	30
Distance from driveway (ft.)	5	5	25	15
Distance from tree (ft.)	10	10	-- [D]	15
Distance from slopes greater than 25 percent (ft)	25	25	25	25
Maximum slope of ground for construction (%)	25	25	12	-- [D]
Site compaction constraints for absorption areas[C]	No	No	Yes	Yes
Construction season constraints (dry weather conditions)	No	No	May 1 thru Oct. 31	No
Average size of drain field footprint for three bedroom house w/ perc rate of 20 mins/inch (square ft. (SF))[E]	750 SF	2,700 SF	3,060 SF	2,000 SF
Average size of drain field footprint for five bedroom house w/perc rate of 20 mins/inch (SF)[E]	1100SF	3,420 SF	3,430 SF	3,300 SF

Notes:

[A] Acceptable rate varies with soil conditions and engineering judgment, as well as approving authorities review and approval.

[B] None: the sand mound system is constructed above natural ground surface

[C] Site not to be compacted or altered in any way (by earthmoving or other equipment)

[D] No Montgomery County criteria found.

[E] Additional clarifications of criteria and assumptions for footprint calculations are noted below

The sizes of the drain fields noted above in Table 4.1 are determined for comparison purposes only and do not reflect what may be required for a drain field replacement. Each of the drain field sizing calculations is for an initial (single) field only and does not include required reserve areas. The calculations are based upon the following criteria, guidelines and assumptions:

Criteria:

- Stone Trench Systems - Code of Montgomery Regulations Chapter 27A
- Sand Mound Systems– Design and Construction Manual for Sand Mound Systems as published by Maryland Department of the Environment (MDE)
- Drip Systems – Design example provided by American Manufacturing Company as referenced from MDE

Assumptions:

- For both stone trench and sand mound systems, an increase in the size of the drain field is required as the slope of the site increases. For comparison purposes, an average slope of 6 percent was assumed for all six of the calculations.
- The amount of available trench absorption area per linear foot of trench increases as the sidewall depth of the trench increases. This results in a reduction in the required surface footprint for systems using deeper trenches. Trench heights used in the calculations were assumed to be 2.5 feet for shallow tile and 5 feet for deep trenches.
- For comparison purposes, a percolation rate of 20 minutes per inch was used for each of the drain field sizing calculations.

As stated in section 4.5 of the Phase 1 report, current standards require that "For replacement of an existing failed on-site system, the new septic system must attempt, if possible, to meet current standards." The standards applicable to the Glen Hills area require an initial drain field and two reserve areas or backup drain fields. The minimum area required may be no less than 10,000 square feet (slightly less than one quarter acre). Figure 4.1, which follows, shows how a typical sand mound or a stone trench system for a 5-bedroom house might fit onto an existing one-acre lot. The existing drain field area may not be reused for absorption area. In addition, if a well is present, it must be located at minimum of 100 feet from and at a higher elevation than any existing or replaced absorption area. There are a total of nine distance criteria that all absorption areas must meet as specified in *Code of Montgomery County Regulations* (COMCOR) 27A.00.01 On-Site Water Systems and On-Site Sewage Disposal Systems. It is evident therefore, that the design and layout of any replacement septic system must proceed on a case-by-case basis, with the understanding that soil conditions and/or regulatory constraints could potentially prevent the use of certain types of septic systems.

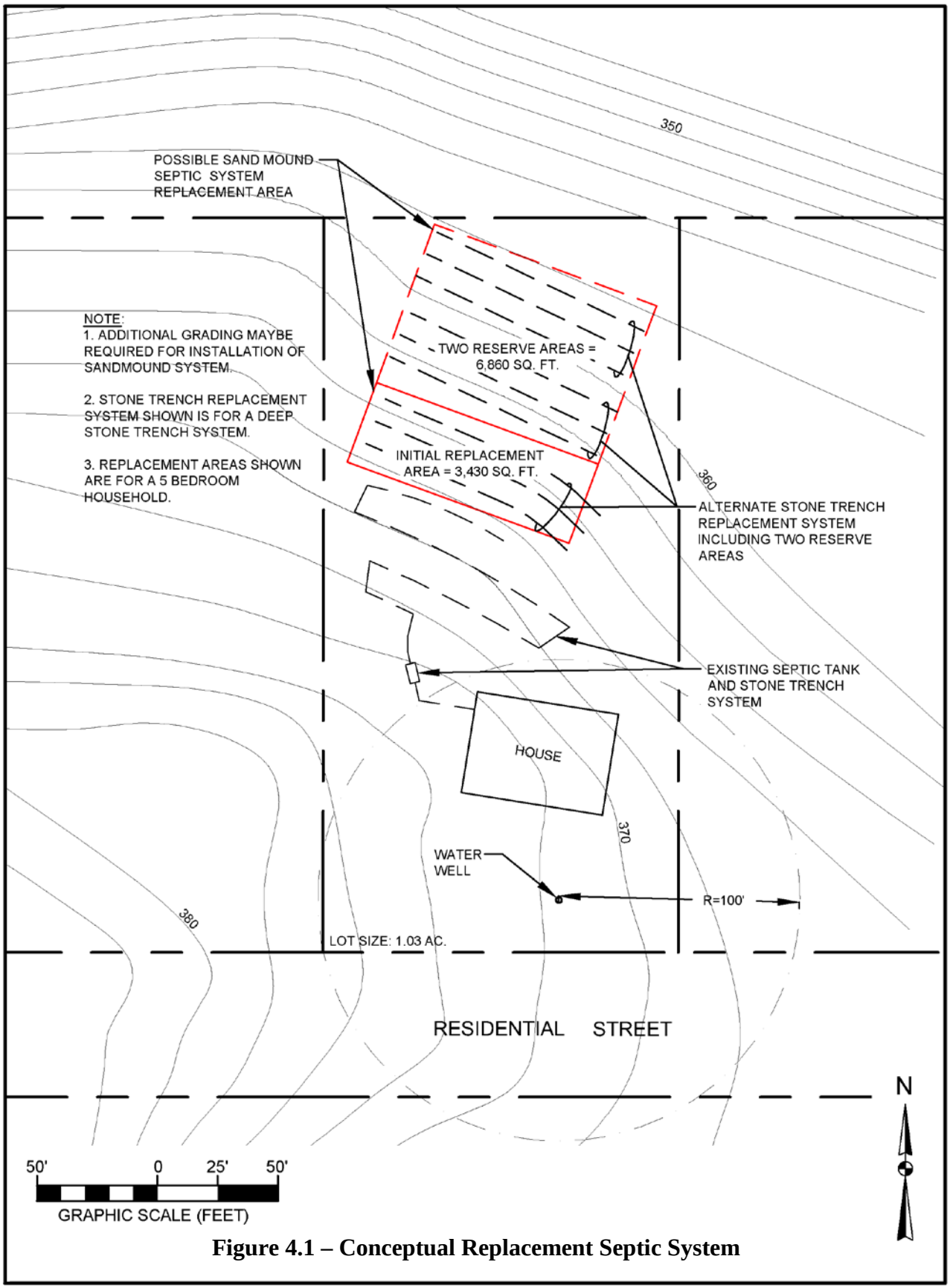


Figure 4.1 – Conceptual Replacement Septic System

4.3 On-Site Septic System Characteristics and Evaluation

Certain on-site waste disposal systems might be selected to address specific soil constraints for both new site and as replacement systems.

Deep Stone Trench Septic Systems:

Deep stone trench systems must have at least four vertical feet of useable unconsolidated, unsaturated soil buffer between the bottom of a disposal trench and the upper limits of bedrock and ground water. Most deep stone trench systems are constructed at a depth of between 4 and 8 feet from ground surface to the bottom of the trench. Therefore the systems require groundwater to be a minimum depth between 8 and 12 feet. Additionally the soil must have adequate permeability rates (2-30 minutes per inch) to ensure proper effluent treatment.

The record information gathered and analyzed in the Phase 1 Report showed one or more soil variables in the study area that may not meet today's septic regulations making deep trench systems difficult to permit and construct within the RAs. Using a conventional deep trench system within an RA to replace an existing septic system is more likely to be constrained than replacing it with the shallow trench, sand mound, or drip systems described below.

Shallow Stone Trench Septic Systems:

A shallow trench system (also referred to as a shallow tile system) may be employed in areas with moderately high groundwater and moderately high bedrock elevations. Shallow trench systems can be installed at a minimum depth of 30 inches from the existing ground surface (18 inch depth of stone and 12 inch minimum soil cover above stone). The shallow trench system requires a minimum of 4 feet of vertical clearance between the bottom of the trench and groundwater or bedrock elevation. Therefore these systems could function in areas where groundwater and bedrock are at a minimum depth of 6.5 feet. The shallower installation does require more area and lengths of drain fields due to lesser amounts of available trench absorption areas per foot. These shallow systems must have the required percolation rate of 2-30 minutes per inch.

Areas that would be suitable for the shallow trench system would have moderate depth groundwater and bedrock (minimum 6.5 feet depth) and suitable percolation rates. Since conventional systems such as shallow stone trench septic systems or sand mound systems could function in these areas, the Phase 1 report did not consider such areas within the RAs. The Phase 1 report would have considered these areas suitable for conventional on-site septic disposal systems. However due to the preliminary level of soil documentation used for the report ,there could be cases in which actual soil testing within the RAs may reveal better soil conditions than the preliminary data the Phase 1 report based its delineation of the RAs. If areas are found with moderate depths to groundwater or bedrock, shallow trench stone systems could be used as replacement systems in areas where otherwise deep stone trench systems would not be viable.

Sand Mound Septic Systems:

Sand mound systems may be able to function in those high groundwater areas with adequate permeability rates where stone trench septic systems would not, because sand mound systems can be built over existing ground without the need to excavate down into the existing ground. They

require only two feet of vertical clearance from the bottom of the sand mound system to the groundwater table. For the same reasons, sand mound systems may be more likely to function in areas with high bedrock elevations but with adequate permeability rates. Again, the minimum clearance from the bottom of the sand mound system to the bedrock elevation is two feet.

The Phase 1 report for this study identified areas in which the further use of deep trench septic systems may be precluded due to shallow bedrock under the soil. Sand mound septic systems could be better suited for these areas as they can be installed in soil with a minimum two-foot depth to bedrock. Acceptable permeability rates would also be needed (see Table 4.1). These areas are shown on Figures 4.2 and 4.3. According to U.S. Department of Agriculture soil survey information, these shallow bedrock areas were 1.5 to 3 feet deep and 3.5 to 5 feet deep. For the purpose of this planning-level study, these areas were considered to be potential candidate areas for using sand mound systems.

High water table areas as indicated on Figures 4.2 and 4.3 were also investigated to determine whether sand mound systems would provide an option for on-site septic disposal. Unlike the high bedrock areas, all of the high groundwater areas also have poor soil permeability rates in the Moderately Slow/Slow/Very slow categories. This combination of potential constraints could make the approval of a sand mound system difficult.

Drip Disposal Septic Systems:

Drip disposal septic systems are considered innovative systems by Montgomery County. These systems are considered in cases in which an existing system has failed and the lot can no longer support a conventional system. The systems are adaptable for situations that, due to existing soil conditions, require shallow installation or in soils with moderate percolation rates. Drip disposal septic systems require more site area than conventional systems. This requirement may constrain the use of drip systems on smaller lots within the Glen Hills area. Because of the use of small-diameter flexible tubing, the absorption system may be placed around trees and other site features with relative ease. The drip systems, like stone trench septic systems, still require a minimum of four feet of clearance from the bottom of the septic system to the upper limits of both groundwater and bedrock elevations. The designs are furnished by industry design experts certified by MDE, but paid for by the applicant. The design criteria, including the allowable percolation rate, is the designer's responsibility based upon certified expertise, soil testing, and evaluation of the existing soil profile. The designs are reviewed and permitted through MCDPS. Drip systems may be viable in areas with percolation rates greater than 30 minutes per inch. Therefore, drip systems may be a good option for areas with marginal percolation rates but with the required clearances to groundwater and bedrock. The Maryland Department of the Environment (MDE) requires periodic inspections of drip disposal systems to ensure proper operation and maintenance of these innovative septic systems.

While there may be locations within the RAs that would fit into this category, recorded soil permeability information was not specific enough or reliable enough to make judgments regarding where these locations exist within the Glen Hills Study area RAs. DPS permit records show that there are nine lots within the study area that have successfully installed drip systems. The locations of these nine lots (See Phase 1 Report Fig. 4.5) are spread throughout the study area with seven of the nine in the north central part of the study area (roughly area bounded by Cleveland Drive, Valley Drive, Oakwood Drive and Sunset Drive). Each of these lots are very close to bordering, or within the RAs.

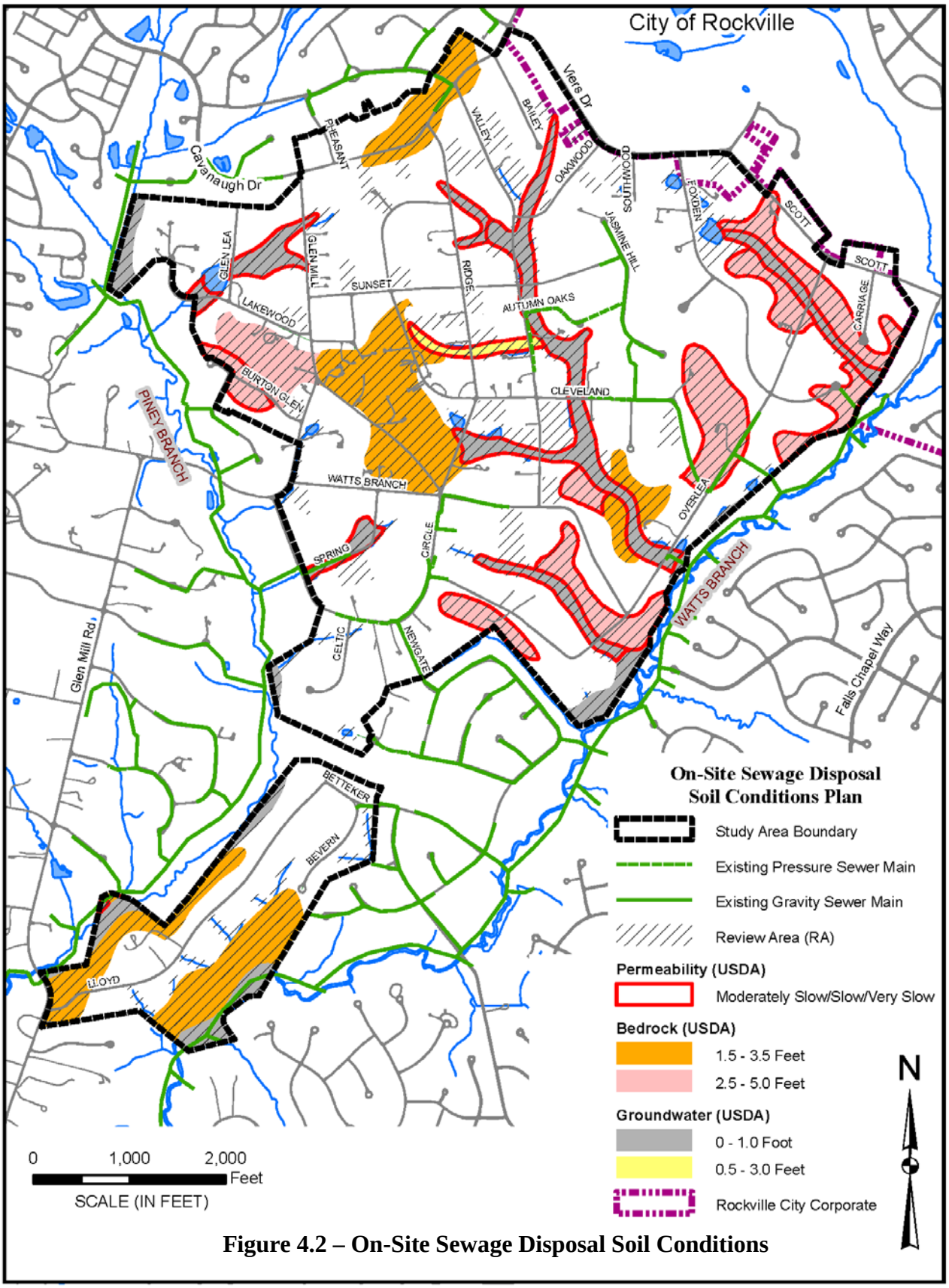


Figure 4.2 – On-Site Sewage Disposal Soil Conditions

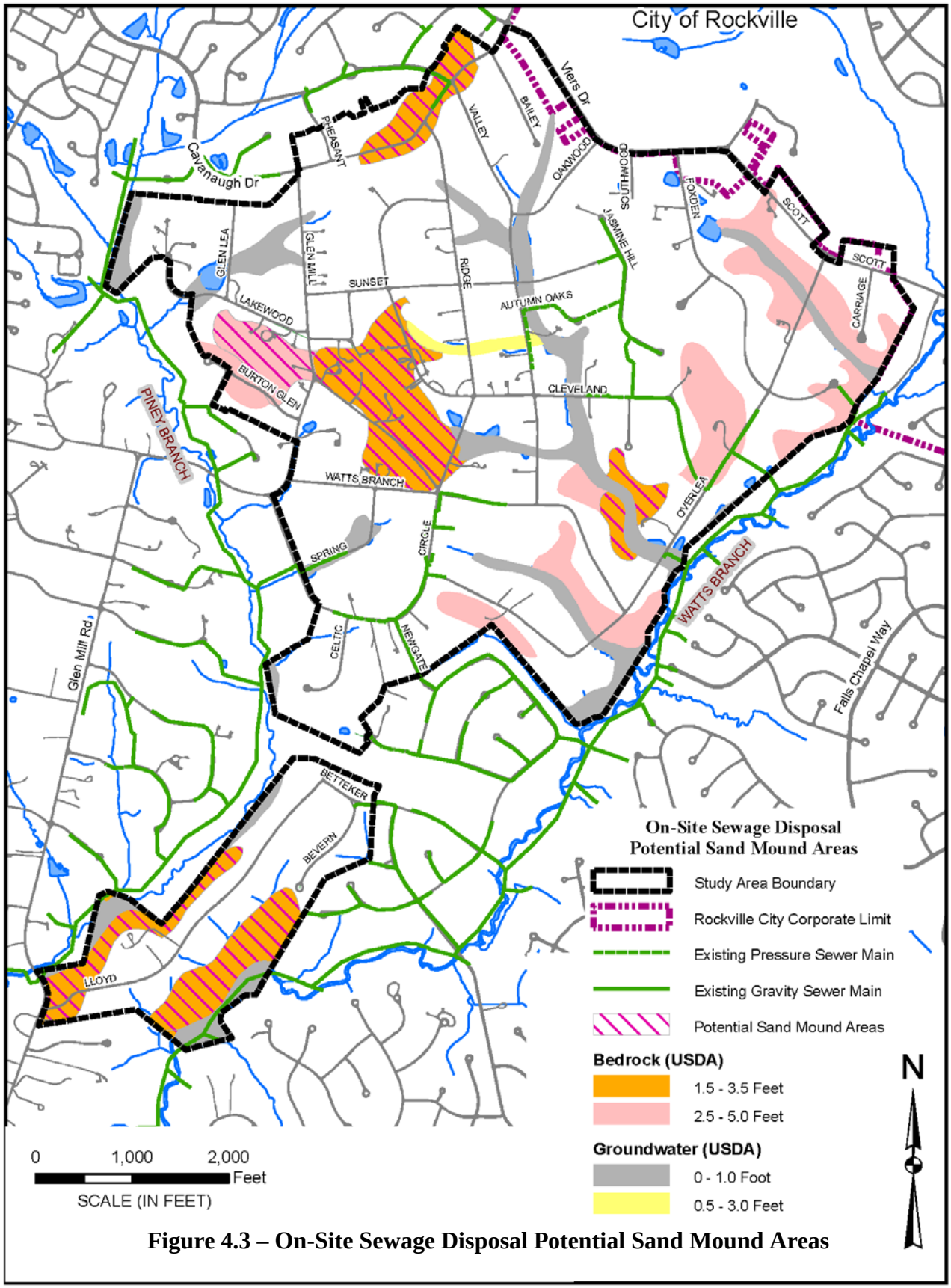


Figure 4.3 – On-Site Sewage Disposal Potential Sand Mound Areas

4.4 Planning Level Costs

Planning Level Costs:

A substantial concern for property owners facing the need to replace a septic system is the cost for that replacement system, which can vary significantly based on the type of on-site system required or if only portions of a system need replacement. For the purpose of this report, estimated costs for replacement septic systems were developed based upon individual costs for components for each type of on-site system considered. The estimates were based on numbers provided from technical publications, *Bay Restoration Program Implementation Guidance*, manufacturers, and local contractors. Additional data is provided in the Appendix 2.

MCDPS adopted regulations in January 2013 which require the installation of a Best Available Technology (BAT) for nitrogen removal in septic tank. The BAT system is a nitrogen removal system approved by MDE for use in Maryland. A list of approved BAT systems can be found on the MDE/BRF webpage at:
http://www.mde.state.md.us/programs/Water/BayRestorationFund/OnsiteDisposal
The technology currently consists of approved pretreatment systems installed in a septic tank which is often a two stage tank. BAT is required as part of any drip system and for new construction. BAT technology is not required for the repairs to and/or replacement of conventional systems. If the replacement is for building expansion that requires an increase in the size of the septic system, then state regulations would require installation of a BAT system. This system adds to the cost of conventional septic tanks but provide cleaner wastewater meeting the nitrogen removal requirements of the new regulations.

The costs listed in Table 4.2 are for new construction, but excludes the cost of BAT technology, except in the case of drip systems. The cost of engineering design, permit application fees and testing have also been excluded. BAT technology can add $6,000 to $8,000 or more to the cost of a system.

Table 4.2 – Range of Costs for Replacement of On-Site Disposal Systems

Septic System Type	Estimated Cost of installed system - 3 or 5 Bedroom House	
	3 Bedrooms	***5Bedrooms***
Deep Stone Trench [A]	$10,000	$17,500
Shallow Stone Trench [A]	$11,500	$20,500
Sand Mound [B]	$20,000	$30,000
Drip Disposal [C]	$37,000	$48,000

[A] Deep trench and shallow trench costs also include excavation, trenching, fill, piping, and seeding. Costs taken from RMS Means (2012).

[B] Sand mound system costs provided by MCDPS (April 2011).

[C] Drip disposal system costs provided by MCDPS and discussions with manufacturer. The cost of Best Available Technology (BAT) tank is included; required for replacement drip disposal systems only

Estimated Operating & Maintenance Costs:

The costs shown in the following table are summaries of data published by the Water Environment Research Federation and are intended to be used for comparison purposes only. Additional information is provided in Appendix 2.

The annual costs include items and assumptions such as:

- Electrical costs for pumps, blowers, and other electrical operations
- Annualized costs for replacement drain field in 30 years
- Septic tank pump outs (every 3 to 5 years)
- Annualized costs for sand mound system replacement in 30 years
- Annualized costs for drip system replacement in 30 years & annual maintenance
- Pump life of 7 years (parts replacement)

Table 4.3 – Comparison of Operating & Maintenance Costs of On-Site Disposal Systems

System Type	Estimated Annual Costs
Trench	$260-$570
Sand Mound	$620-$1,000
Drip Disposal	$512-$748

Estimated Service Life: On-Site Disposal Systems

The service life data in the table below are taken from an on-line reference tool, "InspectAPedia" as well as other published data. The actual lives of individual components are known to vary widely. For instance, there are many examples of pipe distribution systems aged 100 years old and older.

Table 4.6 – Estimate Service Life – On-Site Disposal Components

Component	Estimated Service Life (years)
Distribution System Piping (Gravity and Pressure)	50
Septic Tank (Concrete)	40 or more
Septic Tank Treatment Components (e.g. pumps, motors)	16-20
Drain Fields	20-50

5. Public Sewer Service

The *2002 Potomac Subregion Master Plan* acknowledges the potential need for the extension of public sewer service within the study area, but "… recommends restricting further sewer extensions in Glen Hills to those needed to relieve documented health problems resulting from failed septic systems." The purpose of this section is to evaluate the use of public sewer service as a potential relief method for sewage disposal for the previously identified review areas (RAs). Beginning in the 1960's limited public sewer service has been extended to properties in neighborhoods some as part of new construction or where septic systems have failed. Nineteen percent of the 542 lots within the study area currently receive public sewer service; and throughout much of the study area, the RAs are not in close proximity to existing public sewer mains.

In most cases, the use of public sewer service as a relief method would require the construction of new sewer mains within these neighborhoods. The sewer extension layouts provided in this study are conceptual and only for the purposes of comparing study alternatives. Any actual new sewer design and construction within the study area would be subject to County and WSSC review and approval.

5.1 Options for Public Sewage Systems

The Washington Suburban Sanitary Commission (WSSC) provides the substantial majority of existing public sewer service within the study area. The City of Rockville provides sewer service to properties located within the city limits along the northeastern edge of the study area, primarily along Scott Drive and Viers Drive. The City's sewerage system feeds into WSSC's sewerage system, all of the flows from which are treated at the Blue Plains regional wastewater treatment plant in Washington, D.C.

Design Considerations:

Conceptual alignments for public sewer extensions were laid out according to design criteria and guidance from the *2002 Potomac Subregion Master Plan*, *the WSSC Design Manual* and the *Montgomery County Comprehensive Water Supply and Sewerage Systems Plan*. Four key criteria were considered in for sewer extension options designed for the purposes of this study:

- Alignments were chosen for the purpose of extending sewer service to properties with existing houses using septic systems. None of the extensions were designed for the sole purpose of providing sewer service to unimproved properties.

- Alignments were chosen as much as possible to locate the sewer mains within public road rights-of-way. This would avoid the effects of sewer construction on the environmentally-sensitive stream valley areas of the study area.

- Alignments were designed to maximize the use of gravity lines where possible and minimize the use of pumping systems and pressure sewers. WSSC generally prefers the use of gravity sewer systems over the use of pressure sewer systems. Some areas did require pressure systems to avoid placing sewer alignments in stream valley areas.

- Alignments were designed to avoid the need for public utility easements that would have to cross private properties.

The study area primarily drains to two sewersheds that follow the stream valleys of Piney Branch and Watts Branch. Piney Branch is a tributary of the larger Watts Branch watershed and flows into Watts Branch southwest of the study area.

Within these two main drainage basins, the neighborhood consists of numerous subwatersheds which result from the area's hilly, rolling character. Because of this, each individual sewer service extension can provide service to only part of the RAs identified in the study area. The design of a sewer extension layout, constrained by the design criteria described previously, resulted in thirteen separate sewer system extensions connecting to existing sewer systems in or near the study area as shown on Figures 5.1 and 5.2. Five extensions originate from the Piney Branch sewerage system; nine extensions originate from the Watts Branch sewerage system.

The provision of public sewer service to additional properties within the study area will increase wastewater flows collected within these two sewer basins. WSSC staff has reviewed the public sewer options developed for this report and concluded that the increased wastewater flows from the number of potential sewer connections from the study area could be adequately accommodated within the existing drainage basin collection systems.

Figure 5.2 shows the conceptual sewerage system design in relation to the existing property and house layout of the study area. Based on this design, these sewer extensions could serve as many as:

- 197 total improved properties with existing houses.
  - 121 improved properties via the Watts Branch sewerage system.
  - 76 improved properties via the Piney Branch sewerage system.
- 26 total vacant properties.
  - 12 vacant properties via the Watts Branch sewerage system.
  - 14 vacant properties via the Piney Branch sewerage system.

A more-detailed listing of properties potentially served by each individual sewer extension system is available in Table 5.1 which follows.

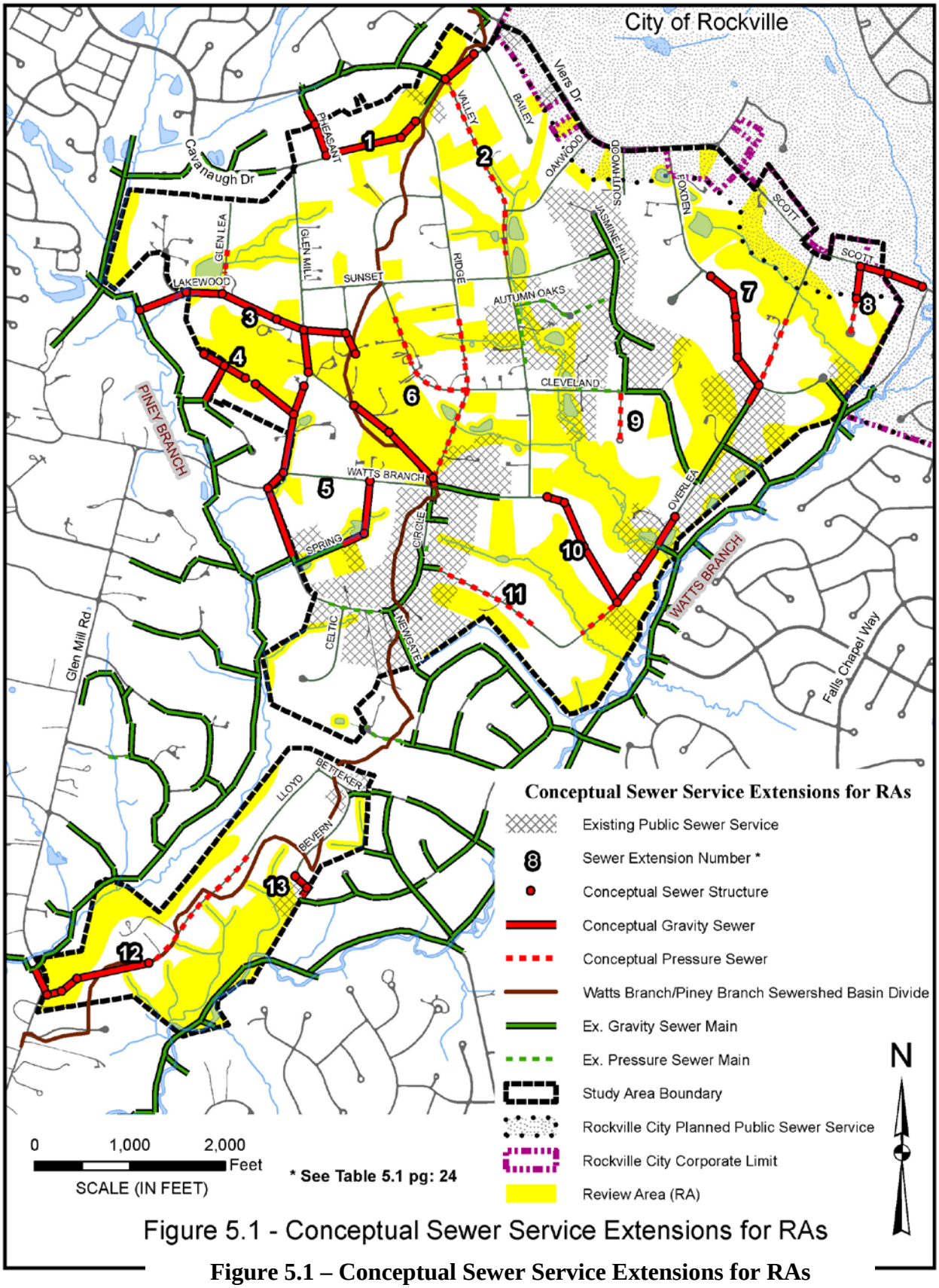


Figure 5.1 – Conceptual Sewer Service Extensions for RAs

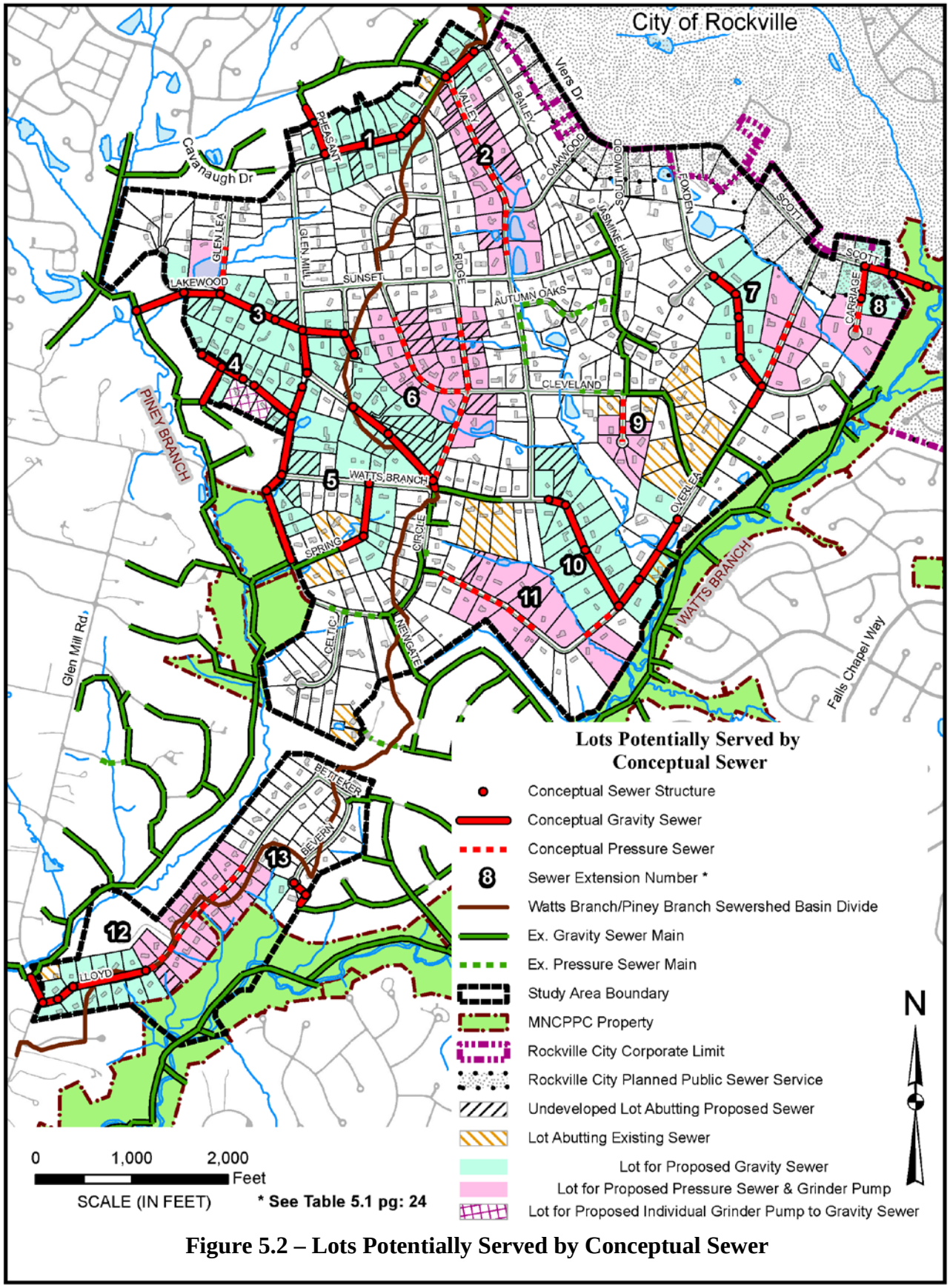


Figure 5.2 – Lots Potentially Served by Conceptual Sewer

Table 5.1 – Numbers of Properties Potentially Served by Sewer Main Extensions

Extensions to Piney Branch System		Adjacent Properties with Existing Houses		Vacant Adjacent Properties	
Extension Number [A]	Location	No. of Possible Connections		No. of Possible Connections	
		Gravity	Pressure	Gravity	Pressure
1	Glen Mill Rd./Pheasant Dr.	16	0	1	0
2	Glen Mill Rd/ Valley Dr./ Bailey Dr.	5	11	0	8
3	Lakewood Dr./ Glen Lea Way./ Glen Mill Rd.	16	1	2	0
4	Burton Glen Dr.	6	1	0	0
5	Burton Glen Dr./ Glen Mill Rd./ Spring Dr.	18	2	3	0
12	Lloyd Rd.	14	18	0	1
Piney Br. Sewerage System Subtotals		75	33	6	9
Piney Br. Sewerage System Totals		108		15	

Extensions to Watts Branch System		Adjacent Properties with Existing Houses		Vacant Adjacent Properties	
Extension Number [A]	Location	No. of Possible Connections		No. of Possible Connections	
		Gravity	Pressure	Gravity	Pressure
6	Circle Dr./ Cleveland Dr./ Ridge Dr.	9	17	1	8
7	Foxden Dr./ Overlea Dr.	8	7	0	0
8	Carriage Ct./ Scott Dr.	4	5	0	0
9	Cleveland Dr./ Cleveland Ct.	0	7	0	0
10	Valley Dr./ Watts Branch Dr./ Overlea Dr.	18	3	1	0
11	Overlea Dr.	0	10	0	1
13	Bevern La.	1	0	0	0
Watts Br. Sewerage System Subtotals		40	49	2	9
Watts Br. Sewerage System Totals		89		11	

Complete Systems Totals	197	26
[A] Extension numbers are keyed to the numbered symbols on Figures 5.1 and 5.2.		

Note: Table 5.1 corrected 3/13/15 to move Extension No. 12 from Watts Branch to Piney Branch

Table 5.2 – Potential Sewer Service Type

Sewer Service Type	No. of Houses	% of Total
Potential Service by Gravity to Gravity Sewer Extensions	115	58
Potential Service by Pumping to Pressure Sewer Extensions	79	40
Potential Service by Pumping to Gravity Sewer Extensions	3	2
Total Number of Served Houses	**197**	**100**

In either of the preceding public sewer alternatives, the existing connection to the septic system is disconnected from the house and rerouted to the public sewer. MCDPS advises property owners switching from septic systems to public service to properly abandon their septic tanks by filling them with gravel (See Figure 5.4) at the end this section.

System Extension Process:

The majority of study area property owners who pursue the provision of public sewer service will need to proceed through the following process:

- Apply to the County Department of Environmental Protection (MCDEP) for a sewer service area category change from the existing category S-6 to S-3.*
- Assuming the sewer category change request is granted by the County, apply to WSSC for a sewer main extension, service connections, and on-site plumbing permits. This evaluation has assumed that owners will apply for main extensions under the System Extension Permit (SEP) program, WSSC's most commonly used extension process. This and the following steps are typically managed by a project engineer hired by the owner. The project engineer will design the needed main extension and follow up with WSSC to ensure that the design is approved and appropriately permitted.
- Construct the main extension, sewer service connection, and on-site plumbing.
- Upon WSSC approval and acceptance of the sewer main extension, complete and cover all construction, then dedicate the new main and service connection to WSSC for operation and maintenance. Abandon the existing septic system according to MCDPS requirements. Public sewer service will then be available and ready for use.

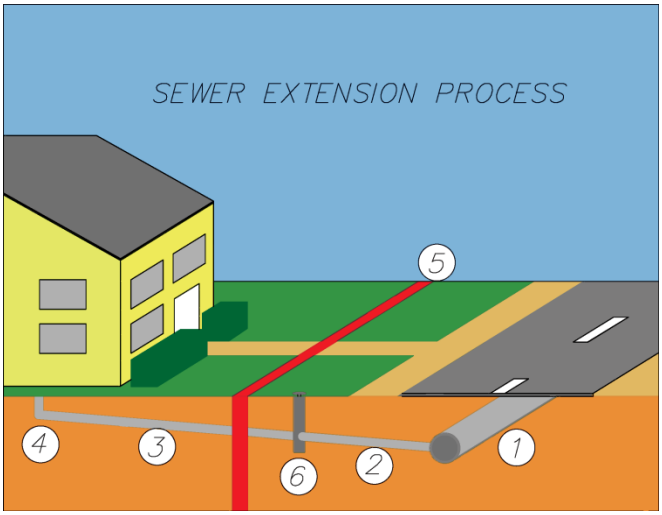
As shown on Figure 5.2, there are 21 improved properties in the study area that abut existing sewer mains, but are not currently approved for public sewer service. These property owners will not need to construct new sewer mains in order to access public sewer service, and would need to proceed through the following process:

- Apply to MCDEP for a sewer service area category change from the existing category S-6 to S-1.*
- Assuming the sewer category change request is granted by the County, apply to WSSC for a sewer service connection and on-site plumbing permits. This and the following steps are typically managed by a WSSC-registered master plumber hired by the owner. The plumber will work with WSSC to ensure that the service connection and on-site plumbing needs are approved and appropriately permitted.
- WSSC will typically construct the sewer service connection, and the owner's plumber will perform the on-site plumbing work.
- Upon WSSC approval and acceptance of the on-site work, cover all open excavated construction. Abandon the existing septic system according to MCDPS requirements. Public sewer service will then be available and ready for use.

  **Additional information on the category change process, application information and fees, etc. is available at MCDEP's webpage: www.montgomerycountymd.gov/waterworks.*

Property owners seeking public sewer service within the City of Rockville service area will substitute the City's Dept. of Public Works for WSSC in the above procedures. City service polices allow for the provision of public sewer service only to those properties within the city limits. Therefore, some cases may require annexation into the city.

Figure 5.3 – Typical Gravity Sewerage System Components



1. Sewer Main Extension
2. Sewer House Connection
3. Sewer House Hookup
4. Building Hookup
5. Property Line
6. Clean-Out

Table 5.3 - Sewerage System Components & Responsibilities

Figure 5.1 Item	**Design & Construction Process**		***Post-Construction Ownership & Maintenance***
	WSSC SEP	**WSSC Non-SEP**	
Sewer Main Extension (1)	Applicant	WSSC	WSSC
Sewer House Connection (2)	Applicant	WSSC	WSSC
Sewer House Hookup (3)	Applicant	Applicant	Applicant
Grinder Pump[A]	Applicant	Applicant	Applicant

[A] Not shown on Figure 5.1

The first step in establishing sewer service for most lots with septic systems will be to obtain a service category change. The application is available and the process explained at the MCDEP website. This process will typically take nine to 15 months from the time of application.

The permitting and plan approval process for extension and connection to the public sewer will be obtained through WSSC Development Services Group (DSG)--specifically the permit services unit of that group. Table 5.3 above, indicates some of the processes and responsibilities. In the table, SEP stands for systems extension plan and SCP stands for system connection permit. For planning purposes, an applicant should anticipate a four- to six-month time period from the time an engineer is selected to approval of plans for a sewer extension and connections.

5.2 Estimated Planning Level Costs

As with septic system replacements discussed in the preceding sections, the costs involved with the provision of public sewer service, if needed, will be of concern for property owners facing such a need. The topography and the zoning of the Glen Hills study area do not contribute to an economical public sewerage system. The numerous hills and valleys in the neighborhood create a need for many separate possible main extensions to provide sewer service. In addition, as the frontage of lots and the distance between houses increase, the cost to provide public service to each lot increases.

Planning level costs for the purposes of this study were developed based on sewer main extension lengths and connections for 197 developed lots. Costs have been broken down as indicated in Appendix 3 between work within the public right of way and for work on each individual lot (see Figure 5.3, for additional information).

The cost estimates and assumptions generated for these system extensions figures are included in the Appendix 3. The costs provided are for construction only and do not include design, testing and permitting costs. The pipeline costs are inclusive of excavation and backfill, piping, manholes, and other items to make a complete functioning sewer system,. Pavement restorations are added to this cost. The basis of the costs is from information gathered from local contractors, utility contractors and WSSC bid tabulations. Bid tabulations are from recent publicly bid projects that show each bidder's bid amount for construction items and are a part of the public record.

Estimated costs* for new public sewer service include the following for each property newly connected to public service are:

- For the service connection, that runs from the main in the street to the property line:
    - $4,500 per property for either a gravity connection or a pressure connection to a gravity sewer main
    - $900 per property for a pressure connection to a low-pressure sewer main.

- For the on-site work, that includes the service hookup that runs from connection at the property line to the house:
    - $26,800 per property for a gravity hookup and other on-site work.
    - $22,100 per property for a pressure hookup and other on-site work.

Combined, these estimated costs can therefore range from approximately $23,000 to $31,300 for each property depending on the type of service connection and hookup required and the type of sewer main available to provide public service.

Where public sewer service does not already exist, requiring new sewer main extensions, constructing these new mains will dramatically escalate the cost of providing new public sewer service, *Estimated* costs* for providing new main extensions, based on the sewer extensions designed for this study, are:

- $40,000 per property for gravity sewer main extensions.
- $10,000 per property for low-pressure sewer main extensions.

In considering sewer extension costs, it is important to understand that the estimated cost per property needs to be evaluated cumulatively for a proposed main extension.

- In the simplest example, a sewer extension to an existing main one lot away from the property to be served will likely abut two lots, one on each side of the street. Together, the estimated extension cost for a new gravity sewer would be $80,000 or $40,000/lot x 2 lots. The estimated extension cost for a new low-pressure sewer would be $20,000 or $10,000/lot x 2 lots.
- A sewer extension to a main three lots away from the property to be served would likely abut six lots three on each side of the street. The estimated extension cost for a new gravity sewer would be $240,000 or $40,000/lot x 6 lots. The estimated extension cost for a new low-pressure sewer would be $60,000 or $10,000/lot x 6 lots.

  *Tables providing additional factors for the preceding estimated costs are provided in the Appendix 3.

The preceding sewer extension costs were developed on the basis of using WSSC's standard system extension permit (SEP) process, which is used for almost all new main construction projects in the county. Under the SEP process, an application seeking an extension of public service is required to provide:

- The main extension design.
- Any easements needed for the main and/or service connections.
- All necessary permitting for construction.
- Construction of the main, connections, and all on-site work.
- All funding for the extension project. (Note that under the SEP process, the applicant receives no compensation from other property owners that may choose to connect to the new main at a later time.)

Following construction and WSSC's approval, the parts of the project within the public right-of-way (mains and house connections) are dedicated to WSSC for operation and maintenance. Typically, an individual property owner hires a civil engineering firm to design and manage the project.

Alternatively, WSSC also provides the non-SEP main extension process, under which, WSSC provides the main design, permits, construction of the mains and service connections, and a set financing mechanisms. This option is available only to individual property owners seeking service for existing properties, which includes cases involving failed septic systems. On-site work is still the responsibility of the applicant. The applicant pays for WSSC's work through a combination of annual front foot benefit assessment (FFBA) charges and deficit payments. Other abutting property owners are required to start paying FFBA charges when connecting to the new main, so costs are spread out somewhat among those benefitting from the new service. In cases where the County declares a public health problem due to a failed on-site system, WSSC does provide a construction cost subsidy for each property abutting the new main.

However, overall project costs under the non-SEP process are typically higher than project costs encountered under the SEP process. Given these higher costs, very few, if any, applicants currently undertake the construction of new main extensions using the WSSC non-SEP process. Applicants decide either to proceed with a main extension using the SEP process, or to abandon their request for a main extension. A joint working group, including WSSC, Montgomery County, and Prince George's County staff, is seeking to define a different "non-SEP" process for main extension financing that would make these extension costs more affordable for individual property owners.

Appendix 3 provides addition information regarding costs such as additional detail of on-site costs, grinder pump systems purchase and installation

Operating & Maintenance Costs:

The costs that WSSC incurs for operation and maintenance of its water supply and sewerage systems are passed along to the agency's customers through quarterly utility bills. Billing is based on water use, and the more water used during a billing cycle, the higher the charge per gallon. Typical WSSC residential quarterly bills for 3-5 bedroom homes range from:

- $280 to $500 for both water and sewer service.
- $165 to $290 for sewer service alone

The use of an on-site grinder pump for public sewer service does add some additional cost to the property owner beyond the initial costs for purchase and installation. These costs include both electricity for operation the pump, and an annualized investment for pump repairs and overhaul. According to the Water Environment Research Federation, a home owner would incur an annual cost of approximately $165 to $305 for the electricity to run the pump system and for annualized maintenance costs. (Details are included in Appendix 3)

Estimated Service Life: Public Sewerage Systems

Table 5.4 – Estimate Service Life – Public Sewer Components

Component	Estimated Service Life (years)
Piping (Gravity and Pressure)	50
Grinder Pump Replacement)	16-20

The service lives in the table above are based upon the published WEF data and the current accepted industry standards. The life of individual components are known to vary widely. For instance, there many examples of pipe distribution systems 100 years old and older.

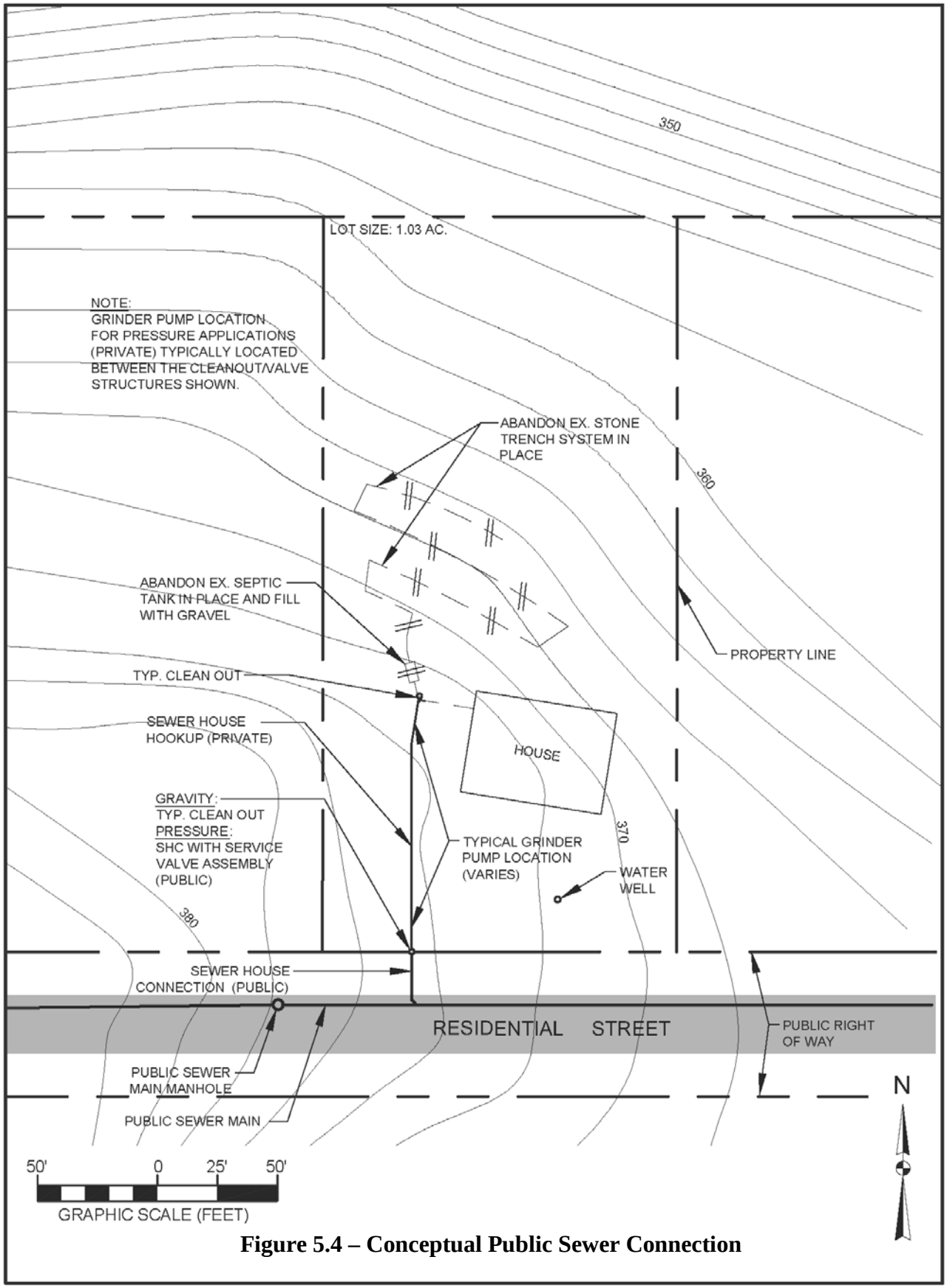


Figure 5.4 – Conceptual Public Sewer Connection

6. Summary and Next Steps

At the direction of the County Council, the Montgomery County Department of Environmental Protection (MCDEP) conducted the Glen Hills Area Sanitary Study to address the recommendation in the *2002 Potomac Subregion Master Plan* that the County undertake:

> "… a study of septic failures in Glen Hills to develop the measures necessary to ensure the long-term sustainability of septic service for new home construction and existing home renovations, and to address the need for limited sewer extensions if needed."

The master plan further recommended that the study include the following elements:

- **"Delineation [of] and possible reasons for known septic failures."** Phase 1 of the study included research into Department of Permitting Services (MCDPS) well and septic system permit records. As part of this research, existing and prior septic system failures were noted and were then mapped as part of the Phase 1 report.
- **"Groundwater testing if needed."** As MCDEP developed the scope of this study, it became clear that, given the resources and timing involved, a planning level effort would be an appropriate approach. This effort would include researching permit records and information on the condition of natural features readily available from reliable, known sources. The collection of site-specific information, requiring well sampling and soils testing, was not consistent with the planning focus of this study. The collection of water and soil testing data would provide a database of questionable value since the presence of typical contaminants (coliform bacteria, nitrogen compounds, etc.) would not directly relate to septic system failures. It is DEPs belief that the author(s) of the master plan did not know that testing water and soils would require a level of detail that could not be justified in a planning study.
- **"Preparation of a logical and systematic plan for providing community [public] sewer service if needed."** The Phase 2 report includes a conceptual design for sewer main extensions that could serve those parts of the study area in which the long-term use of deep stone trench septic system may be constrained by soil conditions or regulatory requirements. The concept sewer system layout developed for this study was to show a "logical and systematic plan" for those areas that may need sewer in the future if replacement of on-site systems proves to be problematic.
- **"Emphasis on extension of sewer mains within public right-of-way rather than within stream valleys."** As described in Phase 2 Section 5.1, the sewer extension concepts developed for the purposes of this study were designed to maximize the use of public rights-of-way and avoid stream valleys and stream buffers.
- **"An evaluation and recommendation of the abutting mains policy for this area."** Phase 2 Section 5.1 provides information on properties that now abut existing sewer mains in the study area and on properties that could abut the sewer mains designed for the purposes of this study. The Executive's report to the Council will include a policy recommendation based on this report and community input. It is not a determination that can be made based solely on the analytical data collected in this study.
- **"Exclusion of properties that are environmentally sensitive and cannot be developed in conformance with established environmental guidelines."** MCDEP has determined that no lots can be determined to be unbuildable ("cannot be developed") based on the planning level data collected and the large size of many lots having environmentally sensitive traits. In a substantially subdivided neighborhood, such as those encompassing

most of the study area, the Maryland – National Park and Planning Commission, makes this determination on a property-by-property basis for the development being proposed. Accordingly, this study did not exclude any properties from possible consideration.

Phase 2 of the Glen Hills Area Sanitary Study identified and evaluated potential sewage disposal options for the Review Areas (RAs) where Phase 1 of the study indicated that the long-term use of conventional deep-trench septic systems may be constrained by local soil and other conditions. When an existing septic system fails, a property owner, working with the County Department of Permitting Services (MCDPS), may find that a lot is unable to satisfy deep trench septic testing requirements with regard to soil percolation rates, depth to groundwater or bedrock, or setbacks from floodplains or stream buffers. In such cases, the owner will need to consider one of the alternatives presented in this report:

- A conventional shallow stone trench septic system.
- A conventional sand mound septic system.
- An innovative drip septic system.
- An extension of and/or connection to the public sewerage system.

Each of these options has advantages and disadvantages, resulting in better applicability in some situation as opposed to others. Given the conditions in the study area, it is unlikely that any one option provides a universally better choice than all of the others for the relief of existing septic systems.

The option of using replacement on-site septic systems will ultimately depend on the results of the required on-site testing to determine soil, groundwater and bedrock conditions. The results of this study indicate that within locations identified as RAs, testing for shallow stone trench, sand mound or drip systems instead of a traditional deep stone trench system could increase the probability of successful permitting, construction, and long-term operation of an on-site septic system.

The option of using public sewer service for the replacement of existing on-site septic systems will depend, in part, on sewer service policies adopted by the County Council in the County's *Comprehensive Water Supply and Sewerage Systems Plan*. (At present, new sewer service is allowed only in cases where the failure of an existing on-site system is confirmed.) Conceptual designs for public sewer extensions to RA locations were developed for this report to better understand the impact and cost of extending public sewer service further into these neighborhoods, if needed. These systems were located within the roadway to avoid stream valleys and the need for easements from private landowners. The systems consisted of both gravity lines and, where needed due to the terrain and sensitive environmental features, on-site grinder pumps and pressure sewers.

A planning-level construction cost estimate was prepared for each of the options.

The estimated on-site sewage disposal option construction costs per lot for system replacement ranges from $17,500 to $48,000.

The estimated costs for providing public sewer service, in cases where a sewer main is available to serve a property, ranged between $23,000 and $32,000 for a single property. However, if a new sewer main extension is needed, a single property owner would need to add at least an

estimated $20,000 to $80,000 to that preceding cost for the construction of the new main. The further a property needing sewer service is from the existing public sewerage system, the greater the main extension cost.

The following table summarizes and compares the options of on-site disposal and public sewer extension for the Glen Hills Area in the following categories: public disruption during construction, operation and maintenance, costs, and longevity.

Table 6.1 – Summary & Comparisons of Options

Comparison Topic	**Use of an On-Site Septic System**	**Use of Public Sewer Service [A]**
Construction/ Installation Responsibility	Property owner	Property owner requesting new service.
Construction Costs	Generally lower than public sewer, but can vary substantially according to the type of system used. All costs fall to the property owner.	Generally higher than for on-site septic systems. Affected by length of sewer extension required; this can raise costs to substantially more than for an on-site system. All on the property owner requesting new service.
Construction Impacts and Disruption	Mostly on-site for the owner	Mostly off-site for the public; some on-site as well.
Operation and Maintenance (O&M) Responsibility	Property owner	• On-site components: Property owner. • Off-site mains and connections: Utility (WSSC or Rockville)
Operation and Maintenance Costs	Depends on system type. Stone trench systems: Lowest annual O&M cost for periodic tank pumping. Sand mound and drip systems: O&M costs are higher due to pumping systems (electricity and maintenance) added to tank maintenance.	• Gravity service: Very low annual cost. O&M by utility is included in quarterly utility billing. • Pumped service: O&M costs are higher due to pumping systems (electricity and maintenance).
Direct Use Cost	None	Billed by utility (WSSC quarterly) based on water usage.
Useful Life of Components	Drain fields: 20 to 50 years or more Septic tanks: 40 years or more Pumping systems: 16-20 years	• Mains (gravity & pressure): 50 years or more • Pumping systems for subdivisions and larger flows: 25 years or more • Grinder Pump Systems: 16-20 years
Feasibility of Service	Service is dependent on testing results affected by soil conditions and on regulatory requirements.	Service is dependent on technical and financial feasibility.
[A] Assumes the use of the WSSC SEP permit process.		

This study was conducted at the request of the County Council based on recommendations from the 2002 *Potomac Subregion Master Plan*. It is intended to provide the Council with background

information on conditions in the study area and on how those conditions can affect the available options for the relief of failed septic systems. The Council will decide whether or not these conditions warrant a reconsideration of the recommendations and policies affecting on-site septic service and public sewer service for the study area in the master plan and in County's *Water and Sewer Plan*.

Towards accomplishing that goal, MCDEP will:

- Develop a staff report to accompany the study's Phase 1 and Phase 2 Reports for review by the County Executive.

- Forward the Executive's report and recommendations on the study to the County Council for consideration.

- Continue to coordinate public outreach with the Glen Hills study area community throughout the Council's consideration of the study.

- Work with the Council, the Planning Board, and other appropriate agencies to implement service policy changes the Council deems appropriate, if any.

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