



Carroll County, Maryland Water & Wastewater Options & Strategies for WRE

Strategies for Addressing Other Water and Wastewater Issues - September 11, 2009 DRAFT

This memorandum has been prepared to describe other possible strategies for addressing water and wastewater issues relevant to the Carroll County Water Resources Element (WRE). Recommended strategies that the County and its municipalities could choose to incorporate into the WRE are discussed. In some cases, the strategies are new topics not covered in prior Malcolm Pirnie deliverables for the WRE. In other cases recommended strategies touch on issues previously addressed as part of the WRE, but for which more detailed guidance may now be helpful in taking water and wastewater initiatives to the next logical steps.

Water Supply Strategies

As discussed below, several key areas of technical evaluation and regulatory coordination have been highlighted that are warranted to keep the County and towns moving forward toward implementation of expanded water supply to meet future needs.

County-Wide Planning. In general, much of the water supply planning that has been conducted historically within Carroll County has been somewhat incremental in that the needs of individual towns have often been considered without a view toward a more County-wide perspective. The County-wide perspective used in the WRE Alternatives Evaluation fostered development of several alternatives where the needs of multiple communities could be met by a single large project, thereby offering potential economies of scale. Another consideration in moving toward County-wide planning is that large projects such as reservoirs or large interconnections with other water systems can have the added benefit of helping avoid the sprawl that may otherwise occur where new development is based on individual large lots dependent on groundwater wells and septic systems. Avoiding such sprawl and instead concentrating development in selected growth zones can help achieve the goal in the Pathways Plan of preserving more open land in County.

Demand Management. In general, jurisdictions and associated utilities should be encouraging water conservation and efficiency to reduce long-term system costs and produce additional societal benefits. In addition, as part of moving forward with development of new water supply alternatives that require significant regulatory approvals, it will be important to continue to document demand management practices that are already being followed within Carroll County. It is recommended that water use tracking methods be established that will allow the County and towns to better quantify the effect of demand management efforts already being taken. Careful evaluation of existing water use data (including numbers and types of connections) is typically required to quantify such effects. These data can then be used in support of permit applications required to implement new water supply projects.

Diversification of Water Supplies. One of the most important recent trends in sustainable water supply planning is a movement toward diversified water supply development (e.g., not placing all your reliance on groundwater supplies). This new trend is often referred to as integrated water resources planning and can ensure that options still exist to meet water supply needs even if the continued use of one water source becomes severely constrained. For example, regulatory or natural constraints can greatly limit use of certain water supplies during drought or other emergency conditions. For this reason, the WRE Alternatives Evaluation emphasized the importance of demand management as opposed to just



considering new supply options. In addition, comprehensive and diverse evaluation criteria were used as opposed to just least-cost solutions. An example of this is in the explicit scoring of supply reliability as opposed to just the safe yield capacity. The result of the Alternatives Evaluation was that a diverse range of options were identified to meet the County's future needs through a combination of reservoir, quarry, groundwater and interconnection alternatives.

Future Scenario Planning. The importance of diversifying the County's water supply becomes even more clear when considering the uncertainties that exist when trying to plan for multiple possible future scenarios. Various uncertainties exist with respect to each of the County's water supply options. The concept of "Scenario Planning" provides a framework that embraces such uncertainties and can help preserve the flexibility that the County needs to ensure that its options remain open and that implementable solutions are found.

In traditional planning approaches, alternatives for the future are created and evaluated on the basis of what is known. An alternative(s) is then selected to the exclusion of other plausible possibilities. Unfortunately, it is the unknown or unexpected that are the undoing of most plans. In contrast, Scenario Planning involves framing alternative plans that are driven by critical uncertainties. Scenarios for the future are created and considered equal. Common paths to the most scenarios guide decision-making. Using Scenario Planning, one may consider the alternative future scenarios that might evolve in the key areas of water supply, water quality and the local political environment. A flexible course of action is then sought to focus on the common elements of these various scenarios.

There are probably several future scenarios that could be considered plausible and that would affect recommended water supply or wastewater alternatives for Carroll County. While a Scenario Planning analysis was not performed for the WRE Alternatives Evaluation, here are some possible future scenarios that should be considered by the County and towns as options are weighed for moving forward.

Scenario 1: Regulatory Procedures Related to Water Appropriation Grow More Stringent. If future regulatory procedures regarding the appropriation of existing and proposed groundwater wells change so that the appropriations are set to actual use as opposed to available groundwater, this would result in lower ratings for groundwater alternatives. Planning for this scenario could favor selection of larger surface water options that are able to provide greater yield to satisfy larger water supply deficits in the County. Conversely, if required environmental flow regimes increase, or if Tier II stream designations expand to cover more of the County and the associated regulations are highly protective of surface waters, then this could result in higher ratings for alternatives that do not involve new stream intakes or surface storage impoundments.

Scenario 2: Future Service Area Boundaries Expand to a Far Larger Extent than Currently Envisioned. It is possible that future population growth pressures could result in larger service areas within the County and involve much larger municipal water supply and wastewater capacity needs than currently envisioned. Under such a future, larger surface water supply options and/or large regional system interconnections may be more favorable. This possibility was addressed to some extent within the Pathways Plan Evaluation.

Scenario 3: Rapid Climate Change Occurs with Significantly Hotter and Drier Summers and Falls. A future like this would include longer growing seasons, higher evaporation rates and higher water demands for domestic, industrial and agricultural users. Planning for this scenario could favor selection



of larger surface water options that are able to provide greater yield to satisfy larger water supply deficits in the County. Under such a future the amount of off-stream storage required for stream intake options could increase as dry season streamflows decline to lower levels.

Piney Run Reservoir Facilities Plan. In June 3, 2009 discussions with MDE, it was clear that the State views moving forward with developing Piney Run Reservoir as a water supply as a prerequisite for successfully permitting another reservoir project in Carroll County. Consequently, it is recommended that the conceptual facilities defined for Piney Run Reservoir as part of the Alternatives Evaluation be further developed so that a plan can be put in place for making eventual use of Piney Run Reservoir to serve communities in the southern half of Carroll County. One way to accomplish this would be to commission a preliminary design report for such facilities that would also include detailed consideration of all permitting requirements.

Aquatic Habitat Mitigation for Planned Reservoir Development. In developing cost estimates for reservoir alternatives as part of the WRE Alternatives Evaluation, significant allowances were included for mitigation to offset impacts to wetlands and streams that would be inundated by reservoir development. Under current Maryland policies for acreage replacement, most wetlands must be mitigated for at a ratio of 2:1 (i.e., mitigation to impact area ratio). MDE prefers in-ground, on-site mitigation projects. When that option is not feasible, MDE evaluates off-site options, mitigation banks, and, lastly, payment into the State's Nontidal Wetland Compensation Fund, a state in-lieu fee program that conducts mitigation projects statewide.

The County should also expect to incur significant costs for stream mitigation. Under today's regulatory approval processes stream impacts are also being accounted for, and the required stream mitigation can be more difficult to secure because wetland credits rather than stream credits have more commonly been made available in mitigation banks. Stream mitigation continues to be an evolving regulatory process and bears watching very closely to determine exactly how it will affect permitting and costs of Carroll County's planned reservoir projects.

Given the often great difficulty in securing adequate quantities of wetland and stream mitigation for a large reservoir project, the County should try to identify how it would provide the required quantity and type of mitigation for aquatic habitat impacts. One strategy would be to track development of credits available in commercial mitigation banks serving this region of Maryland. Another strategy would be to try to take some credit for Carroll County's aggressive program for agricultural preservation easements. Still another approach would be to consider whether the lands the County has acquired for development of Gillis Falls Reservoir may be better utilized as habitat preservation and enhancement areas to mitigate for aquatic habitat losses that would be incurred with the Union Mills Reservoir alternative. As determined in the Alternatives Evaluation, Union Mills Reservoir could serve areas in the northern half of the County where additional water needs may be better met by a new reservoir than in the southern half of the County where the existing supply from Liberty Reservoir and the potential supply from Piney Run Reservoir appear adequate to meet future needs.

Minimum Releases for Planned Reservoir Development. In conducting safe yield analysis for reservoir alternatives as part of the WRE Alternatives Evaluation, it was found that use of the Maryland Most Common Flow Method prescribed by MDE to define minimum reservoir releases results in releases which are out of proportion to the safe yield benefit of the alternatives. For example, even with using the lesser of either natural runoff or calculated Maryland Most Common Flows, the average reservoir release of

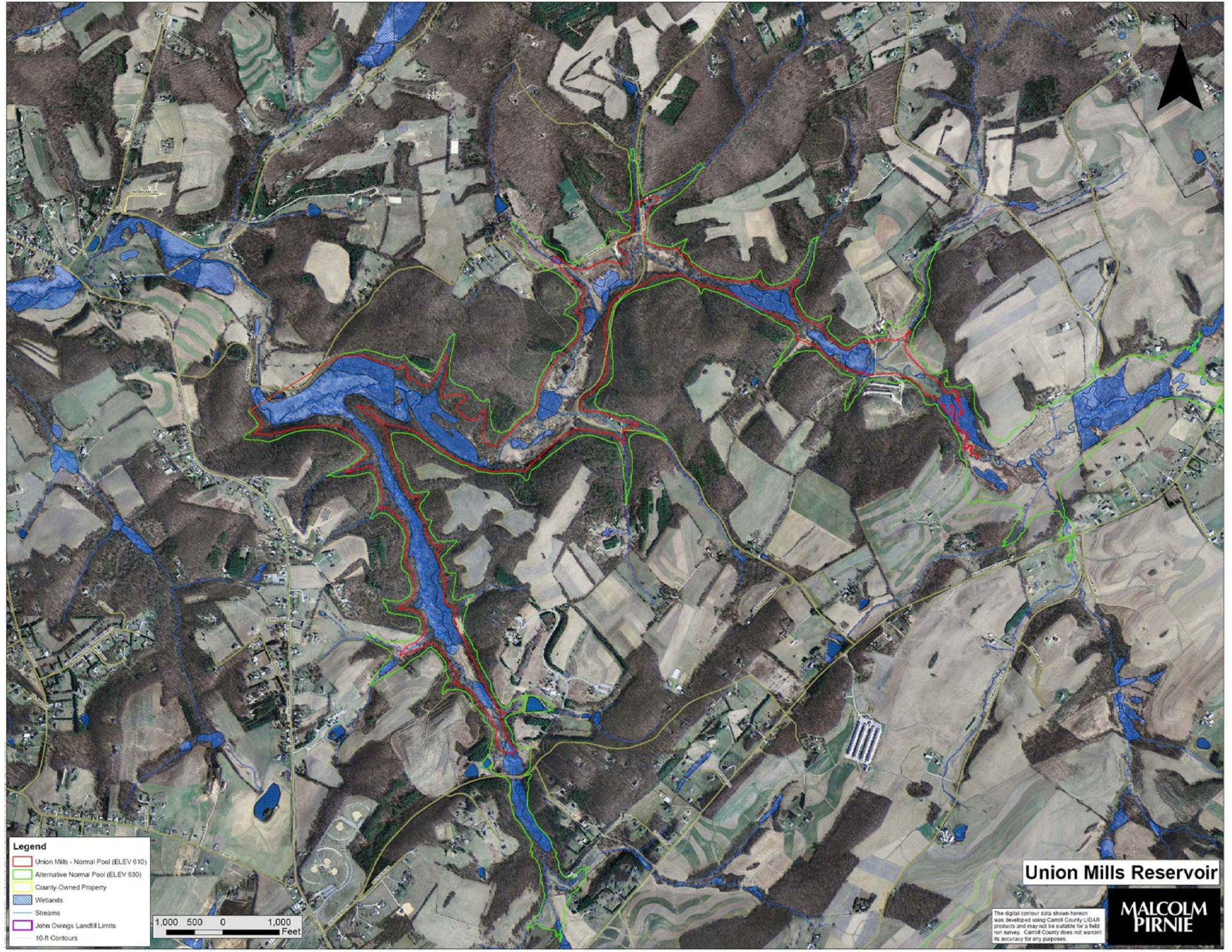


5.48 mgd was 46% greater than the 3.76 mgd estimated safe yield for Union Mills Reservoir (Alternative R-4a). Similarly, for Gillis Falls Reservoir (Alternative R-1a), the average minimum release of 5.45 mgd was 42% greater than the 3.85 mgd estimated safe yield. Minimum releases averaging more than the reservoir safe yield seem excessive based on our experience in reservoir permitting. Consequently, it will be important to try to negotiate less restrictive minimum reservoir releases with MDE to maximize the safe yield benefit of any costly reservoir project. In June 3, 2009 discussions with MDE the idea of drought relief from typical minimum releases was left as a possibility. The County should work with regulators to derive more realistic release rules that do not unnecessarily sacrifice valuable water supply safe yield by augmenting streamflows at rates significantly higher than would naturally occur under drought conditions. One way this is approached for other projects is to have progressively less restrictive minimum releases as reservoir storage declines during extended drought conditions. Regulatory agencies may require that water use restrictions be in place before a permittee is allowed to operate a reservoir with reduced minimum releases.

Flow Augmentation Credit. A key component of the Union Mills Reservoir alternatives defined in the WRE Alternatives Evaluation is flow augmentation of Big Pipe Creek through reservoir releases that could be recaptured about 11 river miles downstream to serve Taneytown. In June 3, 2009 meeting discussions, MDE made it clear that flow augmentation was acceptable to consider, especially since it's done on a much larger scale on the Potomac River through upstream releases from Jennings Randolph and Little Seneca reservoirs. However, it will still be necessary to confirm with MDE that if a specific quantity of flow is released into the creek, then that same quantity could be withdrawn downstream at Taneytown even when streamflow drops below levels prescribed as desired minimum flows. Otherwise, Taneytown's future water supply needs could not be met without some additional local raw water storage or other supplies.

Union Mills Reservoir Environmental Surveys. The Union Mills Reservoir alternatives were defined in the WRE Alternatives Evaluation to serve large portions of the northern half of the County. This alternative compared favorably to other alternatives based on scoring according to the evaluation criteria. However, most of the environmental information available for this alternative dates back to the 1970s when the Watershed Plan and EIS for the Big Pipe Creek Watershed was prepared by the USDA-SCS (June 1976). Given the age of that information, new environmental surveys conducted under modern standards will be required to move this project through the permitting phase.

As part of the WRE Alternatives Evaluation, available GIS layers were used to develop initial estimates of wetland and stream impact (i.e., 114 to 165 acres of wetlands and 8.4 to 15.1 miles of stream for the originally proposed and expanded Union Mills Reservoir footprints, respectively). The attached map shows these approximate wetland and stream areas within the Union Mills Reservoir footprints. Given the large magnitude of these expected impacts and associated costs to mitigate for such impacts, aquatic habitat field surveys are critical. In fact, the most challenging aspect of permitting this reservoir would likely be demonstrating to federal and state regulators that there are no other practicable alternatives that would have less impact to aquatic systems. Federal permitting requirements under Section 404 of the Clean Water Act govern this approval process as administered by the Corps of Engineers and its advisory agencies including USEPA and USFWS. Consequently, we recommend that a field delineation of impacted wetlands and streams be conducted since existing estimates of impacted aquatic habitat may differ significantly from ground-truthed values. Once those areas are field surveyed, the County will better know the required level and cost of mitigation and, if still deemed appropriate, be able to start designing a mitigation plan to offset those impacts.



Union Mills Reservoir

The digital contour data shown hereon was developed using Carroll County LIDAR products and may not be suitable for a field run survey. Carroll County does not warrant its accuracy for any purposes.



- Legend**
- Union Mills - Normal Pool (ELEV 610)
 - Alternative Normal Pool (ELEV 630)
 - County-Owned Property
 - Wetlands
 - Streams
 - John Owings Landfill Limits
 - 10-ft Contours





Other essential environmental reviews for the Union Mills Reservoir alternative would include a Phase 1 cultural resources survey and a rare species review to ensure that other potential environmental impacts of the project are manageable before proceeding further with the project.

Wastewater and Water Quality Strategies

The report entitled *Carroll County Wastewater Limitations* (Malcolm Pirnie, May 2009) discussed both facility-specific and County-wide strategies for addressing wastewater limitations in the WRE. Strategies addressed in that document included:

- Continuation of infiltration/inflow reduction programs
- ENR upgrades and expansions wastewater treatment plants
- Bubbling of NPDES permits and/or point-point nutrient credit trading
- Onsite disposal system hookup credits
- Effluent recycle/reuse
- Use of excess treatment capacity at industrial facilities
- Point-nonpoint source nutrient credit trading

Effluent reuse and use of industrial treatment capacity were further discussed in the report entitled *Carroll County Alternatives Evaluation* (Malcolm Pirnie, August 2009). Together with the possible construction of new wastewater treatment plants (WWTPs) to serve new employment campuses, these strategies represent the core approaches to overcoming wastewater limitations in Carroll County. This section first describes some initial next steps in evaluating the effluent reuse concept, and then moves into secondary strategies that the County and towns might employ to facilitate the primary strategies, or otherwise improve wastewater management in the County.

Prioritization of Land Available for Water Reuse. As recommended in the *Carroll County Alternatives Evaluation* (August 2009), the recycling and reuse of WWTP effluent (or “reclaimed water”) is a viable long-term strategy to help overcome wastewater disposal limitations in the County. The most viable reuse option in Carroll County is water reuse on cropland and/or turfgrass, which was evaluated in Section 4.1.1 of the Alternatives Evaluation (August 2009). Water reuse alternatives were evaluated through a GIS analysis of land use in the vicinity of each of the County’s and town’s major WWTPs with capacities exceeding 0.5 mgd. This analysis also assumed that water reuse would include seasonal irrigation using reclaimed water that meets Class III effluent standards (as defined in the March 2009 Proposed Revisions to the MDE Guidelines for Land Application/Reuse of Treated Municipal Wastewaters), allowing for use in public locations.

The results of this water reuse analysis for the County demonstrated the following:

- Taneytown and Manchester both have sufficient land available within a one-mile radius of their respective WWTPs to potentially reuse 50% of their projected build-out wastewater flows.
- Westminster, Mount Airy and Hampstead all have sufficient land available within a two-mile radius of their respective WWTPs to potentially reuse 50% of their projected build-out wastewater flows.
- The Freedom Service Area does not have enough irrigable land available to meet 50% of the projected build-out demand for wastewater flows.



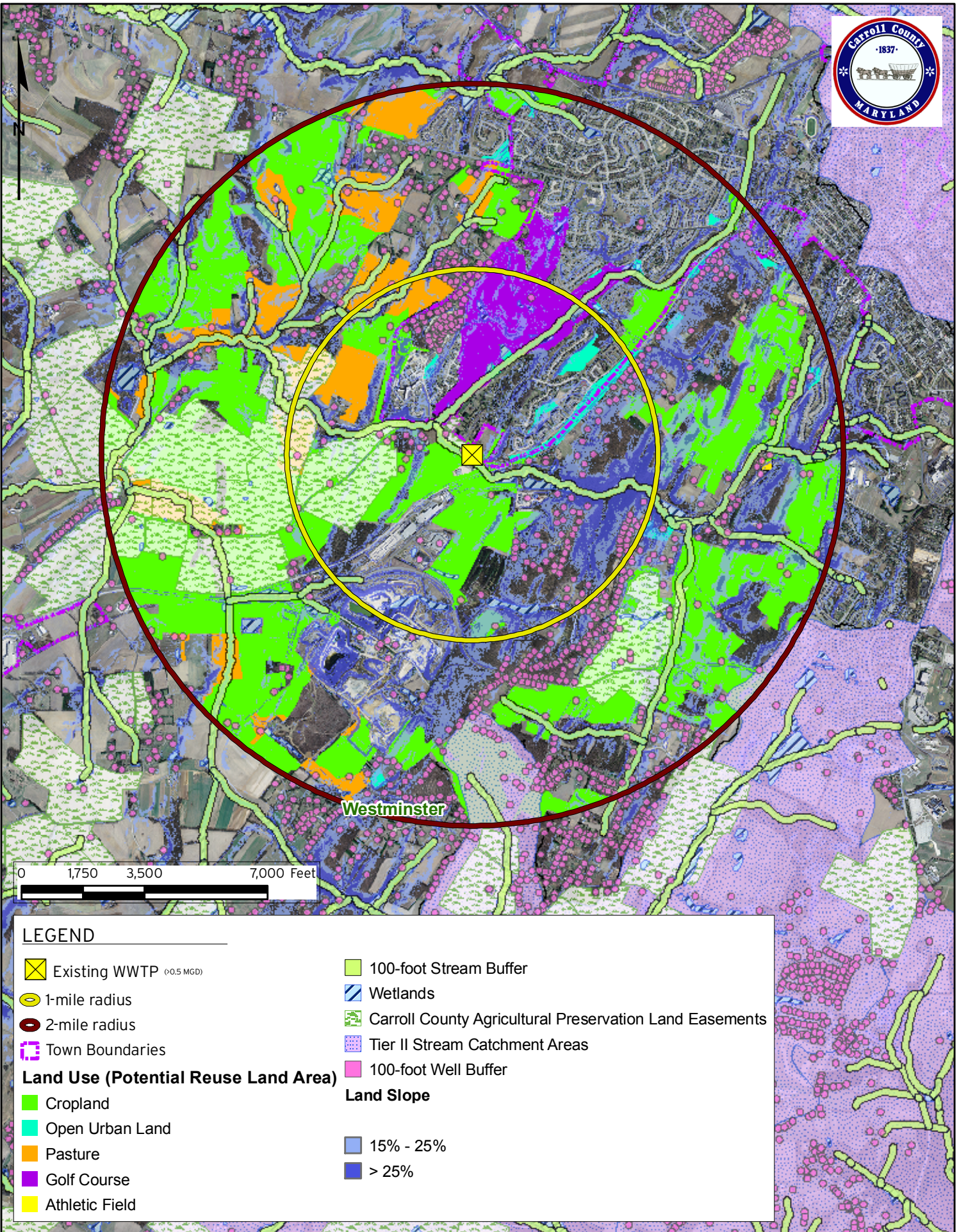
It should be noted that Maryland is currently revising its water reuse regulations to what may end up more closely resembling Virginia Water Reclamation and Reuse Regulations (9 VAC 25-740); however, for purposes of this analysis, the latest MDE guidelines were used to define potential water reuse restrictions that may be applicable when developing a water reuse strategy. The assumptions used in this analysis may change in the future, pending the outcome of water reuse regulation revisions in Maryland.

The next steps in pursuing water reuse opportunities in the County include further evaluation of land available for irrigation using reclaimed water, and prioritization of each municipality's water reuse strategy. Additional GIS analysis could be conducted for potential land use constraints in order to identify and prioritize land areas that should be pursued for water reuse opportunities. The following GIS layers represent examples of additional land use constraints that could be evaluated when prioritizing a water reuse strategy for a particular municipality:

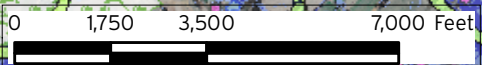
- Carroll County Agricultural Preservation Land Easements: While the presence of agricultural land easements should not eliminate parcels from further evaluation, water reuse in these areas should be limited, and only considered if a sufficient quantity of other suitable land area is not available within a two-mile radius of the WWTP.
- Tier II Streams and Tier II Catchment Areas: Water reuse should not occur on land within a Tier II Catchment Area (which would include land adjacent to Tier II stream segments) due to the potential for additional water quality degradation.
- Wetlands: While Class III effluent guidelines do not identify specific set-back distances from wetlands or other bodies of water, it may be prudent to avoid identified wetlands for reclaimed water use.
- Well Separation Distances: According to proposed guidelines, reuse of Class III effluent should not occur within 100 feet of potable wells, both private and public.
- Streams: According to proposed guidelines, slow rate systems not generating aerosols, (such as a drip irrigation system and a ridge and furrow system), should not occur within a 100-foot buffer of streams.
- Slope Restrictions: According to proposed guidelines, slopes of land to be irrigated via slow rate systems (such as a drip irrigation system and a ridge and furrow system) must be less than 15% on cultivated lands and less than 25% on uncultivated (forested) land.

We have developed an example analysis for the Westminster area using available GIS layers to address the criteria listed above to further prioritize potential lands for water reuse around the Westminster WWTP. As part of the analysis presented in the *Carroll County Alternatives Evaluation* (August 2009), it was determined that Westminster would require 1,669 acres of land to utilize 50% of its Build-out wastewater demand (i.e., 50% of 5.71 mgd = 2.85 mgd) for reuse of reclaimed water, assuming an application rate of 1 mgd per 585 acres (see Table 4-4 of Alternatives Evaluation). Through a GIS analysis of land use within a one and two-mile radius of the WWTP, it appears that the City has sufficient open land within a two-mile radius of the WWTP (1,866 acres) to satisfy the potential water reuse demand of 2.85 mgd (see Table 4-3 of Alternatives Evaluation).

In order to identify and prioritize the most suitable land within a two-mile radius of the Westminster WWTP, the above-mentioned potential land use constraints were identified in GIS. Figure 1 illustrates the land previously identified as areas for potential water reuse, as well as the additional six example land use constraint layers that should be avoided if possible. As shown in this figure, a significant quantity of land appears suitable for reuse of reclaimed water, even after considering the additional land use constraints.



Westminister



LEGEND

- Existing WWTP (0.5 MGD)
- 1-mile radius
- 2-mile radius
- Town Boundaries

Land Use (Potential Reuse Land Area)

- Cropland
- Open Urban Land
- Pasture
- Golf Course
- Athletic Field

- 100-foot Stream Buffer
- Wetlands
- Carroll County Agricultural Preservation Land Easements
- Tier II Stream Catchment Areas
- 100-foot Well Buffer

Land Slope

- 15% - 25%
- > 25%



Pursuing water reuse opportunities on the lands outside of the constraint areas should receive the highest priority when developing an overall water reuse strategy for Westminster and in other communities in the County.

Other Strategies. The remainder of this memorandum addresses secondary strategies that the County and towns might employ to facilitate the primary strategies, or otherwise improve wastewater management in the County. Most of the strategies presented in this section are different but related facets of the enhanced approaches to County-wide water quality management planning, addressing both point and nonpoint source pollutant reduction.

Carroll County's WRE is required to include both point source and nonpoint source elements. It is Malcolm Pirnie's understanding that the County has performed an analysis of nonpoint source nutrient loads using MDE's spreadsheet-based approach. Various regulatory programs are expected to continue to require County-level or HUC-level planning of pollutant load reductions. For example, the USEPA and Chesapeake Bay states have announced the intention to develop Watershed Implementation Plans (WIPs) for the forthcoming Chesapeake Bay nutrient and sediment TMDL. The WIPs will require the setting of 2-year milestones for implementation at the County level. As stated by the USEPA (<http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/index.html>):

"Within the context of the Bay TMDL, the two-year milestones will provide EPA with the means for measuring and ensuring that the jurisdictions continue to make necessary progress toward the goal of restoring Bay water quality. The two-year milestones will provide: 1) commitments for loading reductions to occur during those two years; and 2) commitments on actions necessary to achieve those loading reductions....Jurisdictions will be held accountable for the progress represented in their implementation plans and two-year milestone documents."

It still unclear whether the setting of County-level 2-year milestones will be led by localities or MDE itself. However, it is reasonable to assume that MDE will be looking to localities to provide information on potential implementation activities, and perhaps even enforcing these activities through NPDES permits, MS4 permits, and WRE updates.

With this background, there are various related activities that the County could consider to improve long-term, joint planning of point and nonpoint source pollutant reduction activities. Strong County leadership on this issue could help ensure that WIPs and 2-year milestones are reasonably attainable, cost-effective, properly targeted, and achieve ancillary public benefits. Improved watershed management planning activities would utilize and build upon the extensive GIS data and WRE-related planning activities that the County has already performed. Specific concepts for enhancing the County's watershed management planning capabilities include the following:

Watershed Implementation Plan Work Group. If the County chose to take the leadership in developing local 2-year milestones, one manner to accomplish this would be the establishment of a work group to plan specific pollutant reduction activities and communicate with MDE. The Chesapeake Bay TMDL will require pollutant reductions from multiple sectors in Carroll County, including point sources, stormwater, agriculture, and possibly other sectors such as septic systems. A County-led work group could thus have representatives from multiple sectors and jurisdictions, including public works departments, utilities, the soil and water conservation district, or other non-point source agencies. In addition to developing 2-year milestones for communication with MDE, the work group could use GIS modeling tools to target specific management practices, explore grant funding opportunities, and play a role in public outreach/education



programs. Conceivably, a Watershed Implementation Plan Work Group could address not only the Bay TMDL implementation, but other local TMDLs and source water protection efforts.

GIS-Based Tools for Watershed Management. The County could build upon existing GIS databases and loading analyses to create a system for targeting, planning, and tracking watershed implementation activities across the County. Such systems can be created at various levels of sophistication, from relatively straightforward geodatabases and spreadsheets to more complex GIS-based applications or models. These tools can help target BMPs in the most advantageous locations and calculate nutrient and sediment reductions that would be achieved by different combinations of BMPs. Importantly, a system could ensure that the County is able to track and “take credit” for all implementation activities, including those already accomplished. It could also provide an accounting tool for point-point nutrient credit trades, point-nonpoint nutrient credits trades, and septic system hookup credits.

Targeting of Sustainable Watershed Management Practices. Best management practices (BMPs) intended to protect water quality have other environmental effects that can be positive or negative with regard to ecosystem services and overall sustainability. Some BMPs provide net benefits to greenhouse gas (GHG) emissions, energy usage, wildlife habitat, flood risks, baseflow protection, *etc.* whereas other practices cause net detriments in these regards. Similarly, BMPs vary greatly in their cost-effectiveness; *i.e.*, environmental benefit gain per dollar invested. For example, urban stormwater retrofits tend to be very expensive relative to the pollutant reduction achieved, and provide relatively low ecological benefits compared to other practices such as forestation, riparian buffers, and agricultural BMPs. WWTP treatment plant upgrades increase GHG emissions, whereas nutrient management planning decreases GHG emissions and is extremely cost effective per pound nitrogen load reduced.

In the planning of 2-year milestones, Carroll County could specifically target the most sustainable practices in terms of both cost effectiveness and ancillary environmental benefits. Spreadsheet-based tools such as SUSTAIN version 1.0 can be used to quantify these costs and benefits.

Funding Sources for Implementation. Implementation of the Chesapeake Bay TMDL is expected to significantly increase financial burdens on all pollutant source sectors. ENR upgrades at WWTPs will largely be funded by Maryland’s Chesapeake Bay Restoration Fund. However, implementation for stormwater, agricultural, and other nonpoint sectors will probably need to be met by a combination of sources, including local tax revenue and utility fees, state grants and cost-share programs (e.g., Maryland’s Bay Restoration Fund), and federal grant and cost-share programs (e.g., 319 nonpoint source implementation grants, the Conservation Reserve Enhancement Program, the Environmental Quality Incentives Program), and out-of-pocket landowner costs. The financial burden of TMDL-related mandates is thus a major element of the planning process, especially for the stormwater sector.

In conjunction with other planning activities, the County could initiate focused efforts to evaluate the total costs of TMDL implementation, identify both internal and external funding sources to meet those costs, and pursue specific grant opportunities to ensure that County jurisdictions received an equitable share of available public funding. Studies could include an evaluation of the impact of TMDL implementation costs on utility fees, and the need/practicality of new revenue structures (e.g., stormwater utilities).

Review of Stormwater Programs and Ordinances. In response to Maryland’s Stormwater Management Act of 2007, MDE has revised the state’s stormwater management regulations, updated that state



stormwater design manual, and published a “model stormwater management ordinance” to assist localities with implementing provisions of the Act. Although the County and towns are expected to review and revise their own stormwater programs and ordinances, this process could be facilitated by coordinated efforts between localities. It might be more cost-effective to perform a County-wide review of individual programs and ordinances, relative to the new requirements. Coordination of this effort could also achieve more consistency in stormwater ordinances across the County.

Septic System Improvements. Failing septic systems are a high-priority target for both nutrient reduction and protection of public health. If not already included, the WRE could include a strategy focused on identification and repair of failing septic systems, prioritization of systems to either connect to sanitary sewer or provide alternate treatment, and leveraging of funds (*e.g.*, the Bay Restoration Fund) to pay for such improvements.

Coordination and Funding of Infiltration/Inflow Reduction Activities. As discussed in the *Carroll County Wastewater Limitations* (May 2009) report, infiltration/inflow (I/I) represents a significant portion (10-30%) of the total inflows at WWTPs within Carroll County, and thus occupies a significant proportion of the total wastewater treatment plant capacity. Most but not all of the towns within Carroll County have ongoing programs to reduce I/I. Union Bridge and New Windsor do not have formal I/I reduction programs at this time, and appear to be resource-limited in this regard. These and other localities might benefit from greater sharing/coordination of I/I reduction activities among localities. Lower costs might result from sharing of equipment to detect I/I, and economies of scale in I/I mitigation projects. This task could include identification of external funding sources (*e.g.*, community development block grants, revolving loans) to assist resource-limited communities with I/I reduction.