Westminster

Water Supply

The City is divided into two watersheds by the northeast-to-southwest running Parr's Ridge. The western portion of the City falls into the Double Pipe Creek watershed, part of the Potomac Tributary basin area. The City's Wakefield Valley water system is located in this watershed. Also in this watershed are nine of the City's supply wells, the Medford Quarry emergency water supply, and the Wastewater Treatment Plant, which discharges into Little Pipe Creek. Future projects in this watershed include the Gesell Property well, Greenvale Mews observation well, and Little Pipe Creek intake.

The eastern part of the City falls into the Liberty Reservoir watershed and the North Branch Patapsco River 6-digit watersheds, which are part of the Patapsco/Back River Tributary basin. The City withdraws water from surface intakes on Cranberry Branch and Hull Creek in this watershed. Both creeks are tributaries of the West Branch of the Potomac. Water withdrawn from Cranberry Branch is stored in the raw water reservoir north of Lucabaugh Mill Road. Also in this watershed are three supply wells and one streamflow augmentation well. Portions of the Hampstead and Freedom water and sewer systems are located within this watershed.

Source Water Assessment

The City of Westminster relies upon both surface and groundwater for its potable supply. The unconfined fractured rock aquifer within the Wakefield Marble, Sam's Creek Formation, Marburg Formation, Ijamsville Phyllite, and Wissahickon Formation provide the source of water supply for 11 groundwater wells. Four of the City's wells (Wells 1, 2, 5, and 7) are in the Wakefield Marble. The remaining seven wells are in the crystalline bedrock formations. The City also withdraws water from the Cranberry Run Reservoir. The SWA was delineated by a consultant in accordance with the 1999 MDE SWAP guidance document. Many of the wells are susceptible to natural contaminants such as radon, as well as anthropogenic contaminants like nitrates.

Water Supply Demand

The area within the Westminster GAB is covered by both the *City of Westminster Comprehensive Plan* and the *Westminster Environs Community Comprehensive Plan*, which was developed in cooperation with the City of Westminster to cover the area with the DGA that is outside the City's corporate limits. The total future water demand assumes that everything within the GAB (also referred to in these plans as the future annexation line/limit) builds out according to the adopted land use plan. If this were to occur, the total future water supply demand for the Westminster system would be 5,338,300 gpd.

The numbers in the "Westminster Future Water Supply Demand" table are based strictly on BLI calculations. They do not reflect factors unique to the municipal system that may have been considered in the capacity management plan (CMP) worksheet calculations and figures presented in the next table, "Westminster Water Supply Capacity *Currently* Available for Existing and Future Growth."

Westminster Future Water Supply Demand
(Gallons per Day)

Community	Current Demand[1]	Planned Future Demand[2]		Other Potential Demand[3]	Total Demand
		Infill Demand	Future Demand		
Westminster	2,960,000	732,050	956,400	689,850	5,338,300
Community	**Current Demand[1]**	**Additional Demand by Land Use**			**Total Demand**
		Residential	**Commercial**	**Industrial**	
Westminster	2,960,000	1,497,250	53,130	827,920	5,338,300

[1] These data are the greatest annual average daily demand for the five-year period from 2003 through 2007.
[2] These data relate to areas located within the designated planned water service area. Infill demand is calculated for areas classified in the "Existing/Final Planning" service category; Future demand is calculated for the combined area classified in the "Priority" or "Future" service category.
[3] These data relate to areas designated in the "No Planned Water Service Area" but located within the Community Growth Area Boundary.

Source: Carroll County Department of Planning, December 2008

Calculations for future water demand used the CMP data. This demand is reflected under "Infill + Future." However, the CMP data do not account for additional demand that would occur within the balance of the planned water service area or the area that is designated in the "No Planned Water Service Area." To factor in this further demand, future development potential and existing development that would be served were estimated and calculated for water demand and are reported under "Other Potential Demand."

Water Supply Capacity

If Westminster were to build out according to the planned land uses adopted within the GAB, the City would need to expand the system beyond its current capacity to make available another 1,980,733 gpd. The information in the following table is based on the December 2008 CMP worksheets.

Westminster Water Supply Capacity *Currently* Available for Existing and Future Growth
(in Gallons per Day)

Community	Current			Remaining Capacity	Unserved Demand		Net Avg Day Capacity Available at Buildout
	Permitted	Avg Day Capacity Limitation	Avg Day Drought Demand[1]		Infill + Future	No Planned Service	
Westminster	3,476,000	2,273,077	3,256,000	(982,923)	307,960	689,850	(1,980,733)

[1] Average Day Drought Demand here includes an additional 10% for drought demand

Source: Carroll County Department of Planning, December 2008

These demand numbers shown in the Westminster Future Water Supply Demand table above were based on the BLI. However, in developing the CMP worksheets, the City planning staff was able to take a more detailed look at development potential based on a more intimate knowledge of the suitability of land for development in the GAB and the actual units achieved to refine the demand estimate further. Many of the residential projects that have been recently proposed or built achieved far fewer units than estimated in the BLI. In addition, City staff did not include potential lots from the subdivision of Conservation- or Agricultural-zoned land. Therefore, the demand estimates in the table, "Water Supply Capacity Currently Available for Existing and Future Growth," are lower than those in the demand table.

Water Supply Limitations

The average water usage per residential connection was calculated to be 234 gallons per day (gpd) per connection based on the existing connections and associated water usage. The buildout development for residential connections in the service area is projected to be complete in the year 2042; however, approximately 62 percent of the development is anticipated by 2027.

A linear growth rate has been used to estimate development of the available industrial and commercial development (421 acres) between 2010 and 2027. An assumed 800 gpd per acre for commercial and industrial development was used to estimate the future water demand.

The water allocation to residential, industrial, and commercial users is controlled by the City's Planning Department through the Interim Water Allocation Plan. The City has had discussions with property owners regarding the Interim Water Allocation Plan and the associated priorities. Additional growth beyond the allocated water will be dependent upon new water sources.

At the time of this plan, the City has received requests for water allocations under its Allocation Plan totaling over 228,000 gpd. Additionally, it is estimated that this demand could increase by approximately 50,000 gpd each year until buildout. It is anticipated that a portion of these requests may be fulfilled in the next 3 to 4 years by development of the Gesell Property well. Additional sources needed to fulfill the remaining requests are projected for development after 2015. Potential future sources have been identified (see Strategies later in this section), but not fully tested.

Wastewater

The Westminster WWTP is designed to handle 5.0 mgd. The average wastewater flow into the plant is 4.4 mgd. The existing infiltration and inflow amount for the system is 1.7 mgd. The projected buildout demand according to calculations by Malcolm Pirnie, Carroll County's WRE consultant, is 5.706 mgd. The City plans to start engineering for upgrades to the plant to include additional treatment capacity, and ENR technology. With these upgrades, the expanded plant will be capable of treating a flow of 6.5 mgd to the standards required by State and federal law.

Wastewater Demand

The total future wastewater demand assumes that everything within the GAB builds out according to the adopted land use plan. If this were to occur, the total future wastewater demand for the Westminster WWTP would be 6,720,670 gpd. The numbers in the "Westminster Future Wastewater Demand" table are based strictly on BLI calculations. They do not reflect factors unique to this municipal system that may have been considered in the capacity management plan (CMP) worksheet calculations and figures presented in the next table, "Westminster Wastewater Capacity *Currently* Available for Existing and Future Growth."

Westminster Future Wastewater Demand
(in Gallons per Day)

Community	Current Demand[1]	Planned Future Demand[2]		Other Potential Demand[3]	Total Demand
		Infill Demand	Future Demand		
Westminster	4,430,000	828,500	788,330	673,840	6,720,670
Community	Current Demand	Additional Demand by Land Use			Total Demand
		Residential	Commercial	Industrial	
Westminster	4,430,000	1,501,000	49,910	739,760	6,720,670

[1] These data represent, in general, the annual average daily demand over the three-year period 2005-2007, and include I&I.
[2] These data relate to areas located within the designated planned sewer service area. Infill demand is calculated for areas classified in the "Existing/Final Planning" service category; Future demand is calculated for the combined area classified in the "Priority" or "Future" service category.
[3] These data relate to areas designated in the "No Planned Sewer Service Area" but located within the Community Growth Area Boundary.

Source: Carroll County Department of Planning, December 2008

Wastewater Capacity

If Westminster were to build out according to the planned land uses adopted within the GAB, the City would need to expand the WWTP beyond its current capacity to make available an additional 705,905 gpd in wastewater flows. The information in the following table is based on the December 2008 CMP worksheets.

Westminster Wastewater Capacity *Currently* Available for Existing and Future Growth (in Gallons per Day)

Community	Current			Existing Flows	Capacity Needed			Capacity Available at Buildout
	Permitted	I&I	Remaining Capacity		Infill	Future	No Planned Service	
Westminster	5,000,000	1,743,000	3,257,000	2,687,000	397,295	204,770	673,840	(705,905)

Source: Carroll County Department of Planning, December 2008

The demand numbers shown in the Westminster Future Wastewater Demand table above were based on the Carroll County *Buildable Land Inventory*. However, in developing the CMP worksheets, the City planning staff was able to take a more detailed look at development potential based on a more detailed knowledge regarding the suitability of land for development in the GAB and the actual units achieved to refine the demand estimate further. Many of the residential projects that have been recently proposed or built achieved far fewer units than estimated in the BLI. City staff also did not include potential lots from the subdivision of Conservation- or Agricultural-zoned land. In addition, the general demand figures based on the County BLI assumed 250 gpd per household, MDE's standard planning figure, for consistency among demand estimates for each system. However, the WWCMP worksheets calculated demand at 235 gpd per household based on the City's estimate of actual usage per dwelling unit. Therefore, the demand estimates in the table, "Water Supply Capacity Currently Available for Existing and Future Growth," are lower than those in the demand table.

Limitations Based on Design Capacity

The 5.0-mgd facility must undergo expansion in order to accommodate wastewater demand projected for the planned sewer service area, as well as the entire DGA. The expanded 6.5-mgd facility will be capable of accommodating all projected wastewater flows under both planned sewer service area and DGA buildout conditions. Even under buildout conditions, the 6.5-mgd facility is projected to have an excess treatment capacity of nearly 0.8 mgd.

According to the CMP worksheets, infiltration and inflow (I&I) averaged about 1.7 mgd in 2003, which represented over a third of the total average plant influent at that time. The City has an ongoing program to identify locations of high I&I and to reduce I&I by pipe replacement or slip-lining. As I&I flow is reduced over time, estimates of future excess capacity will be even higher.

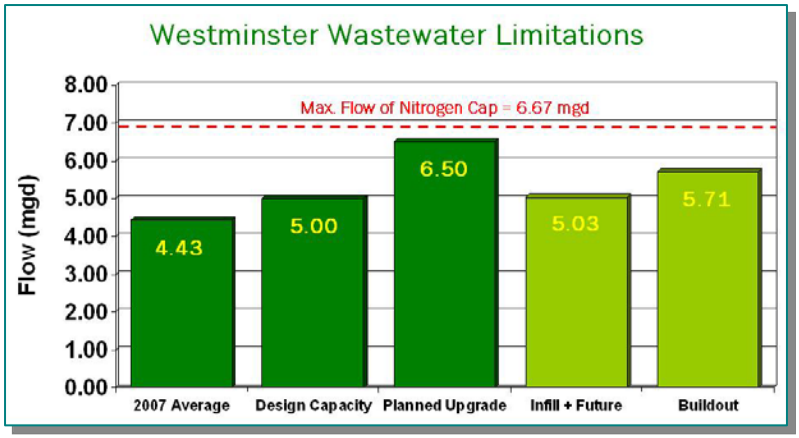
Limitations Based on Local Water Quality

Because the Westminster WWTP can readily comply with fecal coliform and TSS limits, the TMDLs for Double Pipe Creek for fecal coliform and TSS will not represent the controlling limitations to discharge. The most recent NPDES permit fact sheet for the facility states that "the evaluation of the recent water quality data collected upstream and downstream of the discharge point showed no significant impact of the effluent discharge to the receiving waters." Therefore, the future TMDL for biological impairments in the Double Pipe Creek watershed is also not expected to impose the controlling limitation on discharge rates. The future phosphorus TMDL for Double Pipe Creek is unlikely to impose phosphorus limits that are more stringent than the Bay-related nutrient caps. The Westminster WWTP is not upstream of a Tier II stream segment.

Limitations Based on Bay Nutrient Caps

The City's planned ENR upgrade project will be designed to achieve 3.0 mg/L total nitrogen and at most 0.3 mg/L total phosphorus. At these concentrations, the total phosphorus loading limits would be more controlling than the nitrogen limit, and would limit discharge to approximately 5.0 mgd. However, it is expected that the WWTP will be able to achieve lower effluent phosphorus concentrations, such that the nitrogen cap will represent a more controlling limitation. At 3.0 mg/L total nitrogen, the Westminster WWTP would be limited to discharging approximately 6.67 mgd, which is greater than the planned expansion to 6.5 mgd.

Summary of Wastewater Limitations



The existing controlling limitation for the WWTP is the current design capacity. By expanding to 6.5 mgd and upgrading to ENR, the Westminster WWTP will be able to accommodate all wastewater demands to buildout, and still have excess capacity, without exceeding loading limits imposed by the City's NPDES permit. The planned design capacity of the plant represents the controlling limitation.

System-Specific Strategies: Westminster

Note: Numbers for each objective correspond to the relevant objective in the countywide strategies section of this plan. Objectives included below are those that apply specifically and uniquely to this system. Strategies that apply to the County and all of the municipal systems are included in the Countywide Strategies section of this plan.

System-Specific Action Items Already in Place: Current Protections, Practices, and Polices

✓ Services to Areas Outside City Boundaries

The City's water service area currently extends outside the corporate limits to serve approximately 3,500 of the total 9,200 connections. In other words, 38 percent of the City's treated water serves unincorporated properties. In August 2002, the Mayor and Common Council adopted Good Cause Waiver Criteria for the extension of public water and sewerage service beyond the corporate limits of Westminster. That legislation requires new or redevelopment projects to be in compliance with the Town/County Agreement, which stipulates that if the property is contiguous to the corporate limits, the project must initiate annexation into the City of Westminster if it is to be served with public water and sewer service. If the property does not meet the legal test for annexation, its owner must file a Good Cause Waiver with the Mayor and Common Council. If approved, the applicant must execute an "Intent to Annex" agreement with the City of Westminster which is recorded in the Carroll County Land Records. This procedure provides control over the extension of City utilities outside of its corporate limits.

✓ Water Allocation Policy

The City compared water availability limitations for the Westminster service area to current demands and development projections. Due to current limits on water supply, limited growth has been projected. In order to satisfy the MDE consent order, development in the City has been regulated by an allocation policy, creating a prioritized "waiting list" for available water supplies. This process gives the City control over new connections on a project-by-project basis. Due to the use of the allocation policy, the City is considering only very limited changes to the land use plan, GAB, and utility service areas. The City is continuing to evaluate options for more efficient use of existing resources, as well as development of new water sources to accommodate projected growth. Additionally, the City is planning an ENR upgrade to its wastewater treatment plant, and modified site development standards to reduce non-point source pollution.

Until new water sources are developed to balance the drought deficit and provide resources for growth, development will be tightly managed, on a project-by-project basis by the allocation policy. Once development of resources to support growth begins, the City will coordinate with County planning staff regarding land use, GAB, and service area modification to best accommodate the development projected for the Westminster growth

area. It is projected that until approximately 2015, growth will be relatively stagnant due to a moratorium on annexations and good cause waiver applications.

✓ Drought Management Plan

During the summer of 2002, the State of Maryland experienced a severe drought, which required the City to take extensive emergency measures to ensure adequate water was in the system to serve the entire service area. In response to the drought, the Mayor and Common Council adopted a "Drought Management Plan," which provides for a series of water restrictions once drought conditions have been met. By the adoption of this plan, it is not necessary to seek legislative approval to impose water restrictions on all users of the system. This plan also authorizes all police personnel and Westminster Code Officials to issue citations against any person who violates water restrictions. As a result of the drought, The Mayor and Common Council made it a priority to find alternative sources of water.

✓ New Cranberry Water Treatment Plant

The US EPA has taken an aggressive approach to ensure that surface water treatment plants serving over 10,000 persons are in compliance with the *Disinfection By-Product Rule* and the *Long Term 2 Enhanced Surface Water Rule*. The Cranberry Water Treatment Plant was constructed in 1921 and additional units were built in 1964 and 1976. In June 2002, WATEK Engineering found significant deficiencies and identified infrastructure improvements that were needed to upgrade the plant. The technology in the existing water plant had gone well beyond its useful life. After a thorough review of all the alternatives, the City opted to construct a new water treatment plant utilizing membrane filtration. The new Cranberry Water Treatment Plant opened in April 2009. By incorporating the membrane filtration technology into the City's water treatment system, the City will now be able to handle current, proposed, and pending regulations.

Additional Recommended Strategies

1. Protect and sustain existing water supplies serving existing development

System-Specific Action Items Already in Place: ("Continue to...")

- ✓ Implement programs educating water customers about the importance of, and methods to, conserve water
- ✓ Update a WSCMP as background data for this plan document to reflect the most current information then complete and submit a full WSCMP to MDE for review
- ✓ Provide development plans to the County to review and offer comments to the City regarding Water Resource Management

System-Specific "To Do" Action Items:

Short-Term

- ❑ Support the rezoning areas outside the City's future annexation line (Growth Area Boundary) to be consistent with other areas of the county that are not within a DGA to reflect the desired future buildout scenario for Westminster
- ❑ Periodically review and update the WSCMP as a mechanism to continue to track, monitor, and evaluate available capacity
- ❑ Adopt a moratorium on annexation and good cause waiver issuances until water supply is developed to fulfill currently known demand, or for five years, whichever is sooner
- ❑ Implement a system to track water demand for all known and potential development projects by modifying the allocation plan to include allocation of wastewater capacity
- ❑ Implement a system to track water demand demand for all known and potential development projects by modifying the allocation plan to give priority allocation status to projects that demonstrate significantly reduced demand through the use of water conservation measures

Long-Term

- ❑ Identify potential industrial/manufacturing users for which water reuse in operations may be pursued

2. Identify and develop, as needed, new water supplies adequate to support planned future growth without over-allocating available sources

MDE's goal is to ensure that the water quality and quantity at all public water systems meet the needs of the public and are in compliance with federal and State regulations. The City of Westminster will adhere to the guidelines of its allocation policy for the foreseeable future. Currently, the City is developing sources to meet the requirements of the drought-of-record demand. Once these requirements have been met, the City will develop identified sources to provide water to fulfill the 228,000 gpd of known requests plus the projected build-out demand of 4.33 mgd.

System-Specific Action Items Already in Place:

✓ Roops Mill Well: Yield 0.135 mgd, completed late summer 2009
✓ Gesell Property Well: Potential yield 0.500 mgd, still in testing phase

System-Specific "To Do" Action Items:

Short-term Strategy/ies

❑ Evaluate and adopt land use policies that promote higher densities and clustering
❑ Coordinate with efforts by the Carroll County government to develop nearby water sources that are outside City limits
❑ Coordinate with Carroll County government to obtain recharge credit for Woodward Farm
❑ Evaluate and implement measures to ensure adequate recharge for each existing and future water supply source, such as through easements, preservation programs, or purchase

Long-term Strategy/ies

❑ Continue to evaluate and develop surface water sources
❑ Phase upgrades to the newly constructed Cranberry Water Treatment Plant to coincide with projected demand
❑ Continue to implement and refine the Allocation Plan, which ensures the adequacy of water supplies for each project
❑ Continue to reduce unaccounted for water by continuing ongoing efforts to detect and repair leaks, resolve accounting errors, and reduce water that is unaccounted for to an acceptable range of 10-15 percent

Short-term Water Supply Solutions

❑ Groundwater development at Union Mills: Big Pipe Creek has a large, relatively un-tapped watershed, and could potentially produce 0.5 mgd. Due to the cost, testing, and permitting involved, this source would not likely be developed until 2015 or later.

Long-term Water Supply Options

Note: These are options that will be considered for long-term supply. However, inclusion here does not imply that there is a definite plan to move forward with an option. Exploring additional sources, even for those systems that currently project enough capacity to meet demand, is included in order to be prepared for policy changes or other changes that would result in the need for additional available water capacity.

❑ Groundwater Wells: Drill and develop 9 groundwater wells (based on the average MDE appropriation of existing Westminster wells) to meet projected additional demand requirements of approximately 1,176,000 gpd
  - ❑ Obtain control (annex, purchase, or designate as planned WSA) over sufficient acreage in the appropriate watershed(s) to meet the MDE-required amount of recharge
  - ❑ Begin MDE water appropriation permitting process
  - ❑ Acquire ownership or easement of well site(s)
  - ❑ Drill and develop well site(s)
  - ❑ Conduct pumping test(s) and source water quality analyses
  - ❑ Finalize MDE water appropriation permit process

- ❑ Install permanent wellhead(s) and fencing and constructing treatment / transmission infrastructure necessary to connect wells to the WSA distribution system

❑ Surface water intake on Little Pipe Creek**:** An intake on Little Pipe Creek, with storage at Hyde's Quarry, could potentially yield 0.150 mgd.

❑ Union Mills Reservoir: Safe yield 3.76 mgd with normal pool elevation of 610 ft.; planned reservoir; to serve as regional source of supply for Westminster, Hampstead, Taneytown, and Manchester Service Areas

❑ Finished water purchase from City of Baltimore

4. Promote water conservation measures and manage demand for potable water to ensure adequate supplies are available for planned development

System-Specific Action Items Already in Place:

✓ Public Education: Community conservation education and outreach activities
✓ Water Loss Management: As part of the Water Conservation Plan, testing and replacing, as needed, water meters, leak monitoring, and water use audits; City owns its own leak detection equipment
✓ Drought Management: Three-staged drought management plan adopted
✓ Low-Flow Devices: Currently distributing low-flow toilets to customers
✓ Water Use Rate Schedule: Progressive water-rate schedule
✓ Billing Cycle: Quarterly billing cycle

System-Specific "To Do" Action Items:

Short-term

❑ Adopt changes to the Landscape Manual to require the use of xeriscaping principles
❑ Coordinate with the County government to promote and educate about water conservation

Long-term

❑ Seek grant funding to supplement City contributions to programs which promote conservation and implement demand management recommendations
❑ Evaluate and enforce the City's Drought Management Plan to require reductions in water use during times of drought

5. Sustain existing wastewater treatment capacity

System-Specific "To Do" Action Items:

Short-term Wastewater Solutions:

❑ Continue efforts for planned ENR (Enhanced Nutrient Removal) upgrade, enabling the current facility to operate at the limits of technology in terms of nitrogen and phosphorus removal
❑ Conduct an I&I study to determine current level of inflows from I&I to potentially regain some capacity; make system improvements to reduce I&I; adjust the capacity on the WWCMP worksheets to update available capacity

6. Develop new public wastewater treatment and disposal capacity

System-Specific "To Do" Action Items:

Long-term

- ❑ Should the loading rates approach the permitted limits prior to completion of the planned upgrades, evaluate options for spray irrigation and onsite treatment/reclamation of industrial effluent to divert flow from the WWTP
- ❑ Continue to plan for and implement the specific expansion projects described or included in the adopted *Carroll County Water and Sewerage Master Plan*

9. Reduce the amount of impervious surface that could result from new development

System-Specific "To Do" Action Items:

Long-term

- ❑ Implement recommendations from the December 2004 *Source Water Assessment and Wellhead Protection* report, prepared by Advanced Land and Water, Inc.