

# Mount Airy

The Town of Mount Airy is unique among all municipalities in that it is not only divided between two counties, Frederick and Carroll. It is also divided among five watersheds. For the past five years, the Town has been under Consent Order Agreement(s) with MDE to balance its source water supplies with the increasing water supply demands. The successful groundwater exploration for the past couple of years led to an anticipated new well at South Main Street. This well potentially will help the Town satisfy the existing Consent Order Agreement, although with no additional contingencies.

In an effort to address MDE's consent agreement, much research and statistical computations were conducted which lead to the conclusion that there are greater limitations on the Town's WWTP than expected. The Malcolm Pirnie study suggest in an earlier chapter that the Town would be able to handle the projected growth. However, after learning about the physical and financial limitations of WWTP, the projected residential growth will consequently be reduced. This limitation will reduce water demand. Currently, residential growth has reduced drastically due to the restrictive water allocations given by MDE. Please note that the data compiled in the Malcolm Pirnie study referenced throughout this document did not use the current allocations given by MDE. Lastly, only the Carroll County side of Mount Airy was under study for the purposes of this document. Therefore, the data used in this section reflect current allocations given by MDE.

## Water Supply

### Source Water Assessment

The unconfined fractured rock aquifer within the Ijamsville Formation and Marburg Schist is the source of water supply for the Town of Mount Airy. The system uses 10 wells to obtain its drinking water. Well #11 is potentially being developed in the very near future and is approximately equal to Mount Airy's average size well. The Mount Airy water supply is susceptible to contamination by nitrates, VOCs (except well 8), SOCs, and radionuclides, but not susceptible to protozoans. Further, wells 2 and 7 are susceptible to bacteria and viruses.

### Water Supply Demand

The total future water demand assumes that everything within the GAB builds out according to the adopted land use plan. If this were to occur, the total future water supply demand for the Mount Airy system would be 1,189,000 gpd. These demand estimates do not reflect factors unique to this individual municipal system that may have been considered ~~in the capacity management plan (CMP) worksheet~~

**Comment [b1]:** As we discussed, I changed the numbers in the tables to match what was in Barney's comments. Please add text after each table to explain why the numbers are different than those in the Malcolm Pirnie products. Also, add in any additional strategies you would like based on the issues you want to be able to address. If you could use Track Changes to add the text and then send it back to me, I would appreciate it. I'll get it plugged back into the main document with your additions. Thanks!

**Comment [KZ2]:** Brenda we don't put an explanation after each chart, but instead, we stated it in the intro paragraph so it would stand out in the document.

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calculations and figures presented in the next table, “Mount Airy Water Supply Capacity Currently Available for Existing and Future Growth.”

**Mount Airy Future Water Supply Demand  
(Gallons per Day)**

Community	Current Demand <sup>1</sup>	Planned Future Demand <sup>2</sup>		Other Potential Demand <sup>3</sup>	Total Demand
		Infill Demand	Future Demand		
Mount Airy	765,000	87,500	221,750	114,750	1,189,000
Community	Current Demand <sup>1</sup>	Additional Demand by Land Use			Total Demand
		Residential	Commercial	Industrial	
Mount Airy	765,000	285,500	85,250	53,250	1,189,000

<sup>1</sup> These data are the greatest annual average daily demand for the five-year period from 2003 through 2007.

<sup>2</sup> 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.

<sup>3</sup> These data relate to areas designated in the “No Planned Water Service Area” but located within the Community Growth Area Boundary.

Source: Town of Mount Airy, November 2009

### Water Supply Capacity

If Mount Airy were to build out according to the planned land uses adopted within the GAB, the Town would need to expand beyond its current capacity to make available another 400,500 gpd. The information in the following table is based on the December 2008 CMP worksheets.

**Mount Airy 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 <sup>1</sup>		Infill + Future	No Planned Service		
Mount Airy	865,000	865,000	841,500	23,500	424,000	309,250	114,750	(400,500)

<sup>1</sup> Average Day Drought Demand here includes an additional 10% for drought demand

Source: Town of Mount Airy, November 2009

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 “No Planned Service.” No demands are anticipated outside the Town’s current GAB.~~

**Comment [KZ3]:** Brenda, we don’t anticipate demand for areas outside “No Planned Service” area or GAB, which is why we indicate zero.

In September 2009, subsequent to the assessments completed for this plan, the Town's daily average water appropriation was increased from 865,000 gpd to 910,000 gpd. Although this is anticipated to drop, per the Consent [Order Agreement](#), to 803,000 gpd in 2011, it is anticipated that re-appropriations on Well #6 and the addition of the South Main Street well (#11) will ultimately provide the Town with an appropriation of 897,000 gpd. This amount is just enough to meet the Consent [Order Agreement](#) without providing any contingency for Smart Growth or commercial development. The month of maximum use appropriation is anticipated to increase from 1,304,000 gpd by the appropriate month of maximum use on Well #11. The combined month of maximum use is not expected to have any limit on future growth.

The net maximum additional growth anticipated for the Town will drop at that time to 368,500 gpd. An appropriation of 150,000 gpd from the Harrison and Leishear property wells would be a significant step towards the Town meeting its ultimate capacity. The Town is encouraged to enter into an agreement with Carroll County in the very near future in [order Agreement](#) to coordinate the upgrade of Water Station #2 with the added capacity.

#### v **Water Supply Limitations**

The Town of Mount Airy has historically utilized groundwater wells for its primary water supply. The emphasis on groundwater supply has served the Town well over the last thirty years. ~~The primarily procurement of these wells has been through the residential development process and were dedicated to the Town through this process by land developers. and the Town has been fortunate to find, purchase and drill several large production wells over that period of time.~~ The Town currently has control over 11 production wells, all within our municipal boundaries ([4 wells in Carroll County and 7 wells in Frederick County](#)).

The Town would like to continue this trend to rely primarily on groundwater resources within the municipal boundaries. The Town also understands that a long-term water solution may not fit within these desired criteria. Most importantly, the ultimate water supply side must not exceed the design capacity of our WWTP, permitted at 1.2 million gallons per day processing. The WWTP has reached its design and physical limitations at its present location. A second plant would be cost prohibitive for the Town now and in the future.

The Town, however, needs to keep our long-term water supply options open, but with serious consideration of what the long-term financial limitations are for a smaller municipality. Because of these potential financial limitations, the Town may not be able to seriously consider all options possible. The Town fully intends to continue a pace of growth only in line with its water capacity limitations for the long term.

## Wastewater

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The plant discharges to the South Branch of the Patapsco River. No expansion is anticipated for Mount Airy's WWTP; however, the Town is upgrading the plant to ENR. [Environmental factors limit the ability to further expand the plant beyond the current 1.2 mgd capacity.](#)

#### v **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 Mount Airy WWTP would be 1,064,000 gpd. The estimates do not reflect factors unique to this municipal system that may have been considered in the CMP worksheet calculations.

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**Mount Airy Future Wastewater Demand  
(in Gallons per Day)**

Community	Current Demand <sup>1</sup>	Planned Future Demand <sup>2</sup>		Other Potential Demand <sup>3</sup>	Total Demand
		Infill Demand	Future Demand		
Mount Airy	640,000 <sup>4</sup>	87,500	221,750	114,750	1,064,000
Community	Current Demand	Additional Demand by Land Use			Total Demand
		Residential	Commercial	Industrial	
Mount Airy	640,000	285,500	85,250	53,250	1,064,000

<sup>1</sup> These data represent, in general, the annual average daily demand over the three-year period 2005-2007, and include I&I.

<sup>2</sup> 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.

<sup>3</sup> These data relate to are as designated in the "No Planned Sewer Service Area" but located within the Community Growth Area Boundary.

<sup>4</sup> Mount Airy performed a full system I&I camera inspection of the original 1971 sewer system. The inspection revealed three major problems that averaged 250,000 gpd I&I flow. The current demand is the two-year average since repairs were made in May 2007.

Source: Town of Mount Airy, November 2009

v **Wastewater Capacity**

If Mount Airy were to build out according to the planned land uses adopted within the GAB, the Town would have sufficient capacity available with current wastewater flows.

**Mount Airy 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	
Mount Airy	1,200,000	120,000	1,080,000	640,000 <sup>1</sup>	87,500	221,750	114,750	16,000

<sup>1</sup> Mount Airy performed a full system I&I camera inspection of the original 1971 sewer system. The inspection revealed three major problems that averaged 250,000 gpd I&I flow. The current demand is the two-year average since repairs were made in May 2007.

Source: Carroll County Department of Planning, December 2008

v **Limitations Based on Design Capacity**

Site constraints at the WWTP include a stream, floodplain, forest conservation, and a stormwater management facility; although, the design capacity of the existing plant is adequately sized to accommodate future growth. No expansion is necessary. Due to the constraints referenced above the system could not expand beyond the current 1.2 mgd.

### Limitations Based on Local Water Quality

The Mount Airy WWTP NPDES permit includes standard limits for secondary treatment facilities, and is fully protective of receiving waters. Limits for parameters, such as ammonia, were derived for local water quality protection and are expected to remain achievable even under higher effluent flows.

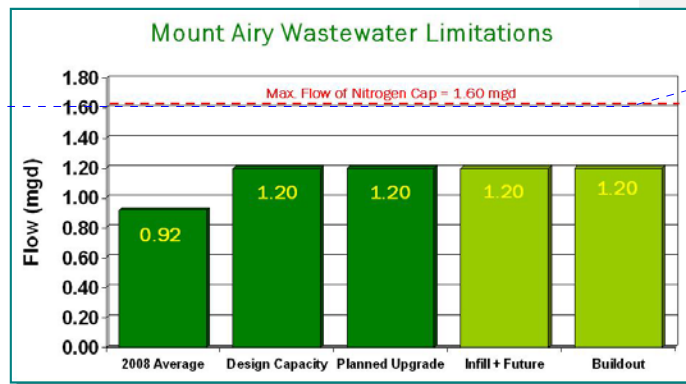
The Mount Airy WWTP discharges approximately 3 river miles upstream of a Tier II segment of the South Branch of the Patapsco River. Given the high levels of treatment and large distance to the segment, the Tier II designation is not expected to represent a controlling limitation on the Mount Airy WWTP discharge.

### Limitations Based on Bay Nutrient Caps

The planned ENR (Enhanced Nutrient Removal) 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 1.2 mgd. However, it is expected that the plant 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 Mount Airy WWTP would be limited to discharging approximately 1.6 mgd, which is more than the projected infill+future (entire planned service area) wastewater demand and the entire GAB buildout demand. Therefore, upgrade to incorporate ENR would allow the facility to meet all projected future flows.

### Summary of Wastewater Limitations

The existing design capacity (1.2 mgd) of the Mount Airy WWTP represents the controlling limitation under current and future conditions. The approximate nitrogen-based capacity limitation of 1.6 mgd is larger than the maximum projected flows and is not anticipated to be a controlling limitation.



Comment [KZ4]: Please change chart to show 1.2 as the Max Flow of Bay Nutrient Caps instead of the 1.6mgd.

## System-Specific Strategies: Mount Airy

*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.*

With the continued support of Carroll County, the Town explored the Gillis Falls area, drilled 28 wells, and performed a long-term test on a well with a marginal sustained yield. This and a couple of smaller wells together would be costly to treat and pipe into the Town, while providing such a low yield. Carroll County provided maps in which the Town could utilize up to 589 acres of the Middle Run Stream subwatershed of Gillis Falls. At an estimated 300 gpd per acre that is equivalent to 176,700 gpd of recharge area.

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Additionally, the Town tested and currently has a pending appropriation request with MDE for Wells #1, #3, #12, and #18, which are located on the Harrison and Leishear properties. This was developer-owned land when the testing was performed and more recently was purchased by Carroll County. Based on the Town's testing, in accordance with MDE procedures, the wells have a known anticipated (combined) appropriation amount of 150,000 gpd.

The wells are situated in the Middle Run Stream subwatershed and are adjacent to the Town's Water Station #2, which has been in its capital plan to upgrade almost immediately.

As mentioned early in the Water section of this document, the limited water supplies can slow or stop planned development, resulting in the inability to fulfill the vision of local comprehensive plans and implement smart growth policies. With the proximity of the wells and the need for treatment upgrade, it would be most feasible, and in the Town's best interest, to acquire water rights and easements on the Harrison and Leishear properties AND be granted the equivalent water recharge area of the Middle Run Stream subwatershed, as was proposed previously by Carroll County. The addition of these wells would provide several years of manageable water to be used towards Mount Airy's smart growth policies.

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### **1. Protect and sustain existing water supplies serving existing development**

#### System-Specific Action Items Already in Place:

- 4 Submitted to MDE a Water Supply Capacity Management Plan (WSCMP) as background data for this plan document to reflect the most current capacity
- 4 Adopted the Carroll County Water Resource Management Code, Chapter 218, which provides source water protection regulations
- 4 Adopted Wellhead Protection article into the Town Code, adopted in 1997.
- 4 Adopted Water Supply Protection requirements into the Town Code (Provides regulations related to recharge management)
- 4 Adopted an Adequate Public Facilities Ordinance, Adopted 1989 and amended in 2003, 2004 and 2007.

System-Specific “To Do” Action Items:

Short-term

- ~~○ Support the rezoning by the County of appropriate areas outside the Town’s future annexation line (Growth Area Boundary) to be consistent with other areas of the county that are not within a DGA to reflect desired future buildout scenario for Mount Airy~~
- Update the WSCMP worksheets developed as background data for this plan document to reflect the most current information, then complete and submit a full WSCMP to MDE for review
- Amend the *Mount Airy Comprehensive Plan* to reduce the size of the Mount Airy GAB to more closely reflect a balance between future demand and potential water supply capacity
- Amend the Municipal Growth Element of the *Mount Airy Comprehensive Plan* and associated annexation areas, as needed, to reflect the changes recommended in this plan

Long-term

- Periodically review and update the Water Supply Capacity Management Plan (WSCMP) as a mechanism to continue to track, monitor, and evaluate available capacity

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

System-Specific “To Do” Action Items:

Short-term Water Supply Solutions

- Middle Run Branch (Harrison/Leishear) Wells: Anticipated yield 0.150 mgd
- South Branch Well: Anticipated yield 0.075 mgd
- Middle Run Branch (Gillis Falls) Well: Anticipated yield 0.050 mgd
- Ben’s Branch Well: Anticipated yield 0.XXX mgd

Short-term Strategy/ies

- Amend the Mount Airy comprehensive plan to reduce the size of the Mount Airy GAB to more closely reflect a balance between future demand and potential water supply capacity

Long-term Strategy/ies

- Explore additional sources for future water supply to prepare for policy changes or other changes that would result in the need for additional available water capacity

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*

**Comment [b5]:** Barney, You didn’t mention this one in your comments. Did you want it to stay? If so, what anticipated yield should I fill in?

**Comment [KZ6]:** Anticipated yield 0.03 0mgd

an option. Exploring additional sources, even for those systems that currently project enough capacity to meet demand, is included in ~~order order~~ to be prepared for policy changes or other changes that would result in the need for additional available water capacity.

- O Groundwater Wells: Drill and develop 5 groundwater wells (based on the average MDE appropriation of existing Mount Airy wells) to meet projected additional demand of approximately 364,000 gpd. This is based on the 2003 adopted town comprehensive plan and the 2006 adopted 'environs' plan. [Note: The number of wells estimated by Malcolm Pirnie to be needed would be less with the increase in appropriation to 910,000 gpd.]
  - o 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
  - o Begin MDE water appropriation permitting process
  - o Acquire ownership or easement of well site(s)
  - o Drill and develop well site(s)
  - o Conduct pumping test(s) and source water quality analyses
  - o Finalize MDE water appropriation permit process
  - o Install permanent wellhead(s) and fencing and constructing treatment/transmission infrastructure necessary to connect wells to the WSA distribution system
- O Surface Water Intake in Gillis Falls Area: Safe yield 0.85 mgd; develop new surface water intake on Carroll County-owned property near planned Gillis Falls Reservoir; 100-120 mg off-stream storage impoundment
- O Interconnection with Freedom: Interconnect with the Sykesville/Freedom water system and purchase agreement to supply approximately 0.85 mgd; 9.7 miles
  - Piney Run Reservoir (as built): Safe yield 3.65 mgd with normal pool elevation of 524 ft.; existing reservoir; to serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas
  - Piney Run Reservoir (expanded): Safe yield 4.11 mgd; increase capacity of existing reservoir by raising the spillway riser and emergency spillway; to serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas
- O Interconnection with Frederick County: Interconnection with Frederick County water system and purchase agreement to supply approximately 0.85 mgd (with a maximum agreement of 1.2 mgd)
- O Gillis Falls Reservoir: Safe yield 3.85 mgd with normal pool elevation of 610 ft.; planned reservoir; to serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas

[The Long term water supply options beyond further ground water exploration may not be financially feasible and may be severely limited due to wastewater capacity.](#)

#### **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:

- 4 Public Education: Website postings, water conservation brochures, posters available at town hall
- 4 Water Loss Management: Annually locate and repair leaks in distribution system; all meters replaced a couple years ago; perform quarterly water loss audits; water loss currently 10-12 percent
- 4 Drought Management: Tiered approach to restrict use during water emergencies
- 4 Low-Flow Devices: Give out free low-flow devices
- 4 Water use Rate Schedule: Progressive water rate schedule
- 4 Billing Cycle: Quarterly billing cycle
- 4 Other Measures: Provides rain barrels to residents at discounted price

#### **5. Sustain existing wastewater treatment capacity**

##### System-Specific Action Items Already in Place:

- 4 Performed I&I inspection of entire 1971 original sewer system in 2007; I&I improvements are ongoing each year to minimize unwanted flows to the WWTP.

##### System-Specific "To Do" Action Items:

###### Short-term

- O Amend the Mount Airy comprehensive plan to reduce the size of the Mount Airy GAB to more closely reflect a balance between future demand and potential wastewater capacity, reducing the future demand to bring it under the 1.2 mgd WWTP capacity
- O On a regular basis, or as actions are taken or completed that would change the capacity calculation, update the WWCMP worksheets developed as background data for this plan document to reflect the most current information, then complete and submit a full WWCMP to MDE for review
- O Complete ENR upgrade, enabling the current facility to operate at the limits of technology for nitrogen and phosphorus removal
- O Identify potential industrial/manufacturing users for which water reuse in operations may be pursued