

Chapter 10. Infrastructure and Utilities

10.1 Existing and Planned Water and Wastewater Infrastructure

The County does not provide water or wastewater infrastructure or related services at this time and has no plans to provide these services in the foreseeable future. Each town provides public water and wastewater service to properties within their jurisdictions, sometimes also serving areas just outside their town limits. There are also a couple small community water systems that serve a small number of households.

Hot Springs

Water: The water system consists of two wells, a storage tank and service lines that range in size from two to eight inches in diameter. The primary well provides 250 gallons per minute, while the secondary well provides 100 gallons per minute. Current daily water usage is 90,000 gallons per day. The daily usage is high for a community the size of Hot Springs, and reflects the Town's economic base in tourism.

Analysis from Hot Spring's recent Comprehensive Plan (2008) indicates that any failure of the main well would strain the backup well beyond capacity. Additionally, portions of the Town's water service lines are two and four inch lines. These lines do not meet the State's minimum standard of six inches. Analysis also reveals lead welds in the waterlines throughout the system. These could pose a lead hazard risk and should be replaced when they are exposed during repairs of the system.

Wastewater: The Town's wastewater facility has a treatment capacity of 80,000 gallons per day. There is also a sand filtration treatment system serving the River Drive public housing development.

Projected growth in the area, and the increasing popularity of Hot Springs as a tourism destination, may strain the capacity of the Town's water and wastewater facilities. Improving and increasing water and wastewater infrastructure has been identified as a priority by Hot Springs residents.

Mars Hill

Water: In 2007, the Town of Mars Hill provided water to approximately 3,102 customers. The customer base reflected 743 residential, 78 commercial, 2 industrial and 36 institutional metered connections.

Mars Hill owns and operates a 0.8 million gallons per day water treatment plant that was built in 1996 and is located at the headwaters of Laurel Creek. There are two raw water reservoirs that provide storage for Mars Hill within the Laurel Creek reservoir. The Poplar Cove reservoir

has a capacity of about 12 million gallons, while the Carter Cove reservoir has a capacity of about 1.7 million gallons. The Carter Cove reservoir is used to supplement the Poplar Cove reservoir. Treated water is then piped to a 400,000 gallon concrete clear well and transported to the town's distribution system via gravity transmission line. A large portion of the transmission line was built in the 1920's and is made of cast iron. The Town replaced three miles of the main distribution line in 2003 and will begin replacing another two miles in 2010. Once the 2010 project is complete, this will constitute over half of the main distribution line replaced from the reservoirs to Town, and the most leak-prone areas.

Mars Hill owns four above-ground water storage tanks. These tanks store 1,160,000 gallons of water for the water customers. The water distribution system consists of approximately 37 miles of lines ranging from 12-inch cast iron to one-inch PVC. Overall the water system is in good condition.

Wastewater: There were approximately 600 connections to the Town of Mars Hill's wastewater system in 2007, with an average daily flow of around 0.165 million gallons per day. Most of the connections are within the town limits. The Town maintains seven wastewater pump stations. The wastewater collections system has over fifteen miles of mostly eight-inch PVC gravity sewer lines. A large part of the system was installed in the 1980's and remains in good condition.

The Town of Mars Hill's wastewater treatment plant that was built in the mid-1980's, and is permitted to discharge up to 425,000 gallons per day of treated effluent into Gabriel Creek.

Marshall

Water: In 2007, the North Carolina Department of Environment and Natural Resources (NCDENR) placed a moratorium on any water extensions by the Town of Marshall for two reasons: (1) inadequate water supply capacity; and (2) failing distribution system with inadequately sized lines that were longer than 1000 feet in length.

Marshall currently receives its water from three wells located in the Walnut Creek area. There are also two off-line wells located in Fortner Hollow. The active wells have a yield of about 210 gallons per minute. The Fortner Hollow wells yield around 500 gallons per minute, but are offline due to high mineral content. A new treatment facility, with an estimated capital cost of about \$500,000, would be required in order to use these wells. Marshall's water consumption averages about 125,000 gallons per day, with peak consumption around 160,000 gallons per day. Marshall is currently constructing two new wells in the vicinity of the Walnut Creek wells. The yield of these two wells is expected to be about 105 gallons per minute each.

Marshall has two water tanks with a combined capacity of 1.5 million gallons. The largest of the two tanks (one million gallons), built in the 1930's by the Civilian Conservation Corps, is antiquated and in need of replacement.

There are over 29 miles of water lines in Marshall, ranging from less than two inches to twelve inches in size. Portions of the distribution system were built with cast iron pipe in the 1930's and 1940's and are in need of replacement.

Wastewater: The Town of Marshall's wastewater collection system consists of about 13.5 miles of gravity sewer and force main. The type of lines include vitrified clay, cast and ductile iron and PVC, and they vary in size from four to ten inches in diameter. There is a small inflow and infiltration problem associated with the system.

Wastewater is treated at a facility located on Blennerhassett Island in the French Broad River and has a 400,000 gallons per day discharge permit. The town generates approximately 110,000 gallons per day of wastewater, with a peak of 225,000 gallons per day. The high peaking numbers reflect infiltration and inflow into the system. The wastewater treatment plant was built in the 1980's and has had little in the way of upgrades since then. Disinfection is provided by a UV treatment system; however the system has been periodically out of service over recent years.

10.2 Future Water and Wastewater Needs

Mars Hill – Water

A recent analysis for the Town of Mars Hill prepared by McGill Associates, P.A., projected a 1% annual growth rate through 2029. Based on this projection the water treatment plant should be able to handle the average daily demand (0.349 million gallons per day) and peak daily demand (0.523 million gallons per day) through 2029. Peak demand is based on 50% greater water consumption than average daily demand.

However, the Laurel Creek watershed has been determined to have an inadequate yield of safe water during times of drought. The North Carolina Department of Environment and Natural Resources (NCDENR) mandates that public water systems look for additional water supplies when demand reaches 80% of capacity. This is projected to occur in 2025. Accordingly, the Town of Mars Hill is working on an interconnection with the Town of Weaverville's Ivy River water treatment plant in order to purchase additional water during drought conditions. The proposed interconnection will allow Mars Hill to purchase as much as 200,000 gallons of water per day from Weaverville.

In addition to the water supply needs, there are several other needs within the water distribution system that need to be addressed. Projects identified in the study by McGill Associates study include:

- 1) Water Transmission Line Replacement. This is a two-phase project that will help ameliorate the water loss throughout the water distribution system.
- 2) Banjo Branch Road and Main Street Water Line Replacement.
- 3) Frontage Road Water Line Extension.

- 4) Mountain View Road Water Line Replacement. (Two separate projects.)
- 5) Roy Edwards Road Water Line Extension.
- 6) Parkway View Road Water Line Replacement.
- 7) Bruce Road Water Line Extension.
- 8) Calvin Edney Road Water Line Extension.
- 9) Woods Ammons Road Water Line Extension.
- 10) Park Drive Water Line Extension.

Mars Hill – Wastewater

The Town of Mars Hill’s wastewater treatment plant has the capacity to meet current and projected future needs. However there are several improvements within the wastewater system needed to meet current and projected demands. These projects include:

- 1) College Street/Highway 213 Sewer Line Replacement.
- 2) Woodhaven 1A and 1B Pump Station Upgrades. (To include new electrical controls, emergency generators, hatches, pump rails and discharge piping. This is considered to be an urgent project and needs completing within the next two years.)
- 3) Interstate 26 and State Highway Pump Station Installation. (This will serve the immediate area and transfer flow to the existing Carl Eller Road Pump Station.)
- 4) SR 1605 Sanitary Sewer Service Extension. (To include installation of a Pump Station and extension of sewer lines.)
- 5) Calvin Edney Road and Frontage Road Sanitary Sewer Service Extension.
- 6) State Highway 213 (West of Mars Hill) Sanitary Sewer Service Extension. (To include installation of a Pump Station and extension of sewer lines.)

Marshall – Water

As mentioned in the previous section, the Town of Marshall has been under a moratorium from NCDENR since 2007. The highest priority water projects have been targeted to get the moratorium lifted with work slated to begin in 2009. These projects include the construction of two new wells in order to meet current demand and taking the primary one million gallon reservoir off-line and replacing it with a 0.5 million gallon reservoir. These changes will help reduce water loss within the system. Undersized and deteriorated water lines in the Rector Corner and Bailey Branch areas will be replaced with those of appropriate sizes.

Other projects identified as priorities over the next twenty years include:

- 1) Hill Street/Skyway Drive Waterline Replacement.
- 2) Rollins Road Water line Replacement.
- 3) West US25 Water Line Replacement.
- 4) Roberts Hill Road Water Line Replacement.
- 5) Redmon Road Water Line Replacement.
- 6) Walnut Creek Road Water Line Replacement.

- 7) Water Meter Replacement and Automatic Meter Read System.
- 8) Hayes Run Road Water Line.
- 9) Rector Corner Water Tank.
- 10) Well Construction at Recreation Park.
- 11) New Town Well (site as yet undetermined).
- 12) Fortner Hollow Well Rehabilitation.
- 13) Recoat/Paint Industrial Park Tank.

Marshall - Wastewater

A recent analysis for the Town of Marshall, prepared by Michael R. Goforth, PE, projected an annual growth rate of 2% over the next twenty years. Based on this projection, Marshall has adequate wastewater treatment capacity. However, there are several improvements at both the plant and within the wastewater collection system that will require attention. Priorities over the next twenty years include:

- 1) Replace Island Road Pump Station.
- 2) Walnut Creek Road Sewer Line Replacement.
- 3) Hill Street Sewer Line Replacement.
- 4) Influent Screens at Wastewater Treatment Plant.
- 5) Replace Aerator In Digester at Wastewater Treatment Plant.
- 6) Stand-By Power Generation at Wastewater Treatment Plant and Pump Stations.

10.3 Feasibility of coordinated/consolidated regional water and waste water systems

Staff and elected leaders from the County and the towns have been meeting periodically for the past couple years to discuss common issues and needs related to water and waste water infrastructure, and to explore possible coordination of systems and services. Due to the locations of the towns and the geography of the county, it is not feasible for Hot Springs to connect to or coordinate services with Marshall or Mars Hill. But there is interest from Marshall, Mars Hill and Madison County to work together to develop infrastructure along 213, which connects the two towns. There are still topographic challenges along this route but the towns and county would like to continue to explore options and associated costs, so they can plan for future services along this corridor and for the funding necessary to accomplish this.

10.4 Communications Infrastructure

Residents and business owners throughout the County expressed needs for high-speed internet service and cell phone service. Both of these services are only available in parts of the County – see the Communications Infrastructure Map (Map 15) for tower and line locations and

coverage areas. The primary challenges to providing wired and wireless service in Madison County are the mountainous terrain and rural settlement patterns, making it expensive to run lines and difficult to reach customers with wireless signals.

Current service providers in the County include:

- Charter – Charter provides high-speed phone, internet and cable TV service through a wired service in limited parts of the County;
- Verizon – Verizon provides wireless phone and internet service through five communication tower antennas and 3.5 miles of land lines running from each tower. Verizon is the primary telephone service provider for Madison County.
- Bell South – Bell South provides land-line phone service and DSL internet service to a limited area in the Sandy Mush community.
- French Broad Electric Membership Corporation (EMC) – Through a partnership with the Education & Research Consortium of the Western Carolinas Inc. (ERC), French Broad EMC offers broadband Internet to businesses, school systems and other large organizations located within its western North Carolina service area and near its fiber optic backbone (see map below). Currently, the service is *only* provided for organizations/businesses requiring a minimum of 3Mbit of bandwidth. The service is *not* available for individual home users. Connectivity is provided via the fiber optic backbone which spans through the main towns located in Madison, Mitchell and Yancey Counties.



- Aloft – Aloft provides wireless phone and internet service and is currently trying to expand into the Mars Hill area.
- Country Cable – Country Cable serves the Wolf Laurel area and limited parts of Highway 19E with cable and high speed internet services.

10.5 Electricity Infrastructure

French Broad Electric Membership Corporation was formed in 1939, after Madison County Commissioners voted to form a committee regarding a rural electric company. A Board of Directors was appointed to set up the organization and this original Board met in March, 1940, and adopted by-laws and a charter for incorporation under the laws of the State of North Carolina.

French Broad EMC has grown into a modern-day cooperative, with 21 substations serving approximately 35,000 members in Madison County, Buncombe County, Yancey County and Mitchell County in North Carolina, as well as members in Unicoi County and Cocke County in Tennessee.

10.6 Natural Gas Infrastructure

Public Service Gas of North Carolina (PSNC) serves the Mars Hill area with natural gas service. This is the only area of Madison County that is served by them at this time.

As of 2009 there are no new planned extensions to any additional areas of Madison County. They are currently working on small extensions off of their main service lines.

10.7 Infrastructure Recommendations

10.7.1 Work with Mars Hill and Marshall to develop coordinated plans for development and infrastructure along the NC 213 corridor.

The County should continue to convene meetings with town and county officials to discuss and plan for future development along the 213 corridor. The entities should consider creating an inter-local agreement that outlines the goals for development and the responsibilities of each entity. All three entities should seek funding sources to carry out the necessary feasibility plans and eventually project plans and construction.

10.7.2 Work with each of the towns to adopt a common vision for development surrounding the towns and to provide water and waste water infrastructure, as needed, in these areas.

Each town has their own comprehensive or land use plan and now the County has this comprehensive plan. Some reconciliation of the plans and associated zoning is recommended near the towns' borders to maintain some continuity and create some consistency between them. Working with the towns to develop a common vision for these "border" areas will help

the towns and county plan for services in these areas as well as appropriate zoning for these areas.

10.7.3 Work with internet and telephone service providers and land owners as appropriate, to expand high-speed internet and phone coverage throughout the County.

The County needs to pro-actively engage in conversations with internet and phone providers to facilitate the expansion of high-speed internet and cell phone services in the county and for suppliers to provide these services at reasonable prices to residents and businesses. Businesses and organizations need these services to effectively compete and thrive and to serve their customers. Residents need these services to connect to goods, services, education, jobs and to areas outside Madison County.