

Introduction

The most compelling tasks in implementing the utilities vision of Monroe 2020 will be to find ways of linking and expanding present systems and, in the specific arena of wastewater disposal and treatment, to establish viable approaches on a watershed-wide basis in partnership with Pennsylvania's Department of Environmental Protection. Indeed, forging a partnership with DEP for innovative approaches to water resource conservation will be as important to the success of Monroe 2020 as a comparable partnership with PennDOT in the field of transportation. Monroe County's importance to the state economically and environmentally, the fragility of its environment, and the scale of its rapid growth establish the rationale for such a relationship.

The Current Pattern

In certain respects, Monroe County is well endowed with utility systems. Electric power, telephone, fiber optics, and natural gas are fairly ubiquitous and have strong expansion capability. Not so, however, with the most basic utilities of all: water and sewer. Facilities do exist, especially in the boroughs and sections of adjoining municipalities. But Monroe's water and wastewater service is a patchwork of multiple suppliers and an overall pattern where individual wells and septic predominate. When Monroe County was predominantly rural, experiencing little pressure for growth in population or economic activity, the well and septic emphasis was fine and the streams, lakes, and groundwater resources were not in danger. That context has changed since the population explosion of the 1980s and thereafter.

At the time of the 1990 U.S. Census, about 32 percent of Monroe County's dwelling units were connected to public water systems. Only eight other Pennsylvania Counties (out of 66) had proportionately fewer dwelling units served.³⁷ These were really rural counties, the most populous of which (Bedford) had about half the residents of Monroe and almost twice the land area. Even nine years later, less than half of Monroe's population has public water service.³⁸

Also at the census time, about 25 percent of Monroe's dwellings were on public sewer. Only nine counties had proportionately fewer dwelling units on public sewer³⁹, most of which were also among those low on public water. Of these, also, Bedford had the most residents. Current figures on numbers served by public sewer in Monroe are not available.

In addition to system scarcity, the most striking characteristic of water and sewer facilities in Monroe County is their number. All told, Monroe County is host to 80 separate water suppliers, the largest of which is the Stroudsburg Municipal Authority with approximately 5400 connections and consumption of 1.8 million gallons per day. The smallest is Pocono Valley Health Center, serving 15 people at 600 g.p.d.

Sewage treatment plants with limited service areas are comparably numerous, 39 all told, with some 14 in Pocono Township mainly paralleling routes 611 and I-80.

Indeed, one of the prominent features of existing water and sewer services is, other than their concentration in the boroughs and Blakeslee, Tobyhanna, Smithfield and Middle Smithfield (sewer), the extent to which they may be found in, or adjacent to, primary transportation

³⁷ Bedford, Forest, Fulton, Juniata, Perry, Sullivan, Susquehanna, and Wyoming. Source: U.S. Census Bureau, 1990

³⁸ As estimated in Monroe County Planning Commission and RKR Hess, *Monroe County Water Supply and Model Wellhead Protection Study, Volume 1, 1997, p 1-3.*

³⁹ Bedford, Forest, Fulton, Juniata, Pike, Sullivan, Susquehanna, Wayne, and Wyoming.

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corridors which traverse the county and connect town and village centers with each other. These corridors are important, therefore, not just because of their connectivity function but because they “carry” the municipalities’ principal water and waste disposal lines and plants.

As part of Monroe County’s commitment to implement the Comprehensive Plan, it should stand ready to assist municipalities or groups of suppliers to obtain state funding for linking and expanding existing systems.

Incorporating the Water Supply and Wellhead Protection Plan by Reference

The *Monroe County Water Supply and Model Wellhead Protection Study* is a plan for water supply and distribution, completed in mid 1997. Although prepared prior to the population and housing projections of Monroe 2020 it sets forth policy and action recommendations totally in keeping with the larger planning effort. Therefore, the Water Supply and Wellhead Protection Study is incorporated by reference in the Comprehensive Plan and should be considered an integral part of the plan. It contains a model Wellhead Protection Ordinance, which is also incorporated by reference and will be part of the “tool kit” of model ordinances offered to municipalities.

The document establishes four overall objectives encompassing 13 specific policies, all of which are consistent with this Comprehensive Plan:⁴⁰

A.) **Objective:** Maintain Adequate Long-term Supply of Water for Domestic, Commercial, Industrial Uses.

Policies:

1. Encourage measures to reduce demands for water supply. Monroe County has a high number of vacation homes and recreation based communities. Efforts should be made to reduce water use by using a favorable rate structure.
2. Encourage a balance between aquifer withdrawals and aquifer recharge so that withdrawals do not exceed the long-term safe yield of the aquifer.
3. Protect the county’s natural and man-made surface waters to maintain and enhance all intended uses of the county’s waters.

B.) **Objective:** Maximize the efficiency of water supply systems.

Policies:

4. Encourage the implementation of procedures correcting existing facility deficiencies and improving facility capacity.
5. Encourage the provision of water service that is consistent with growth management.
6. Encourage the delivery of potable water in sufficient quantities to meet peak emergency demands.

⁴⁰ *Monroe County Planning Commission and RKR Hess, Op. Cit. pp 9-16.*

C.) **Objective:** Protect and enhance the quality of surface water and groundwater resources in Monroe County.

Policies:

7. Promote the protection of surface water and groundwater from non-point source pollution. The largest surface water pollutant in the county is sediment caused by erosion. This can be best controlled by utilizing existing and encouraging new watershed stormwater management plans. The largest groundwater pollutant in the county is from on-lot septic. Methods such as central sewer, or central water systems with proper aquifer protection should be encouraged.
8. Encourage the prevention of water quality degradation resulting from point sources of pollution.
9. Encourage the identification and remediation of groundwater or surface water contamination areas. If remediation is found not to be a cost-effective solution, systems should research opportunities for interconnections.

D.) **Objective:** Coordinate water resources planning with other infrastructure and basic services, natural resources, and recreational planning.

Policies:

10. Encourage the use of land development, stormwater, and wastewater techniques that maintain the natural functions of the hydrologic cycle.
11. Identify the character, location, magnitude and timing of development based on the quantity and quality of water that is available without adversely affecting water quality and without reducing the sustainable yield of the water source.
12. Integrate water resources planning with land use, sewage facilities, stormwater management, natural resources, and park and recreation planning.
13. Encourage the coordination of the efforts of agencies responsible for the planning and management of water resources quality and quantity.

Accompanying these objectives and policies are a wide array of recommended actions for the County Commissioners, Planning Commission, municipalities and water suppliers (Pages 9-7 through 9-16). Of particular relevance to the Comprehensive Plan is the emphasis on interconnection of existing systems and protection of the surface and sub-surface water supply. The model wellhead protection ordinance establishes land use and related standards for areas in which wells are located, including their proximity to sewage disposal facilities of various kinds and their relation to stormwater management measures.

Applying an Array of Approaches to Wastewater Disposal and Treatment

No county-wide wastewater analysis and recommendations have been recently prepared, comparable with the *Water Supply and Wellhead Protection Plan*. Although individual

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municipalities have produced plans for addressing sewage disposal and treatment needs as required by Act 537, these plans require continuous updating because of the prospect of continuing growth in population and economic activity. When this growth potential is assessed against the fragility of the Pocono environment and the overriding Monroe 2020 goal of protecting above and below-ground water resources, continued dependence on individual on-lot septic tanks and sand mounds seems impracticable. Already failures have occurred in various locations.

Numerous alternatives can be explored. The most straightforward, in the three centers where sewage systems exist⁴¹ is expansion of distribution lines and treatment facilities. This is now occurring with the extension of Smithfield's line into Marshalls Creek.

A second option, especially for residential subdivisions, is linking multiple on-lot septic tanks to large underground treatment and discharge sites that serve a specific area and are managed by a homeowner group, a municipality or a utility district. These "decentralized" or Large Soil Absorption (LSA) systems can aggregate several hundred lots each, depending on specific local physical conditions. These are among alternatives currently supported by DEP, and they are designed to maintain water quality.

. . . the number of safeguards provided for LSA systems far exceeds those a community normally enjoys with smaller, individually owned systems. They are usually required to be installed more carefully (typically with engineering review), are monitored more thoroughly, are provided with sensible and straightforward institutional arrangements to ensure their regular maintenance and eventual repair, and they are located on the best soils available on the development parcel (among those meeting state criteria for septic systems). Regular monitoring should prevent any wholesale system failure by providing early warning signals. Even in a "worst case" scenario, the municipality would still be able to correct any malfunction by authorizing a private contractor to perform all the necessary repairs and passing the costs directly along to the system owners (as is normally done when individual septic systems fail and are not promptly fixed).⁴²

Each of the above approaches ultimately results in stream discharge of the treated effluent. It represents a matter of some controversy within environmental groups as well as within state DEP and national EPA. Land discharge and treatment, however, is yet another "alternative" approach (already being tried in some areas of Monroe County) that merits deeper examination. Arendt provides examples of Pennsylvania jurisdictions that are utilizing land discharge of various kinds.

In some townships in Bucks County, spray irrigation is the preferred method of treatment partly because the land it utilizes for spraying is designated as permanently protected open space. . . , and also because it helps to recharge local groundwater supplies.⁴³

Another region where this approach is currently being applied by many institutions and municipalities is southeastern Pennsylvania, where the Brandywine Conservancy, the Brandywine Valley Association, and the Red Clay Valley Association have been enthusiastic advocates for many years. One of the long-term goals of these groups is for all sewage treatment facilities in the Delaware River watershed to employ this technology, so that most of the wastewater produced in the region will be renovated and recycled on lands permanently

⁴¹ *The principal town centers encompassing portions of Stroud, Stroudsburg, East Stroudsburg, Smithfield, and Delaware Water Gap; Mt. Pocono; and Blakeslee.*

⁴² *Randall Arendt et al; Rural By Design, Maintaining Small Town Character, Planners Press, Washington, pp.212-213.*

⁴³ *Ibid, p. 218.*

dedicated to agricultural, recreational, or other open space uses. The objective is to make this watershed the first area in the country to attain the national goal of eliminating pollutant discharge into navigable waters.⁴⁴

Monroe County may be an especially favorable place to try some varieties of land treatment, especially because of the vast amounts of open space (both public lands that are not normally accessible to visitors such as the state game lands and the forest and agriculture reserves in Act 319) that are close to areas of expected high population and economic growth. It has been discussed as an option, especially in the Pleasant Valley and Pocono Mountain task forces which have been strongly in favor of testing alternative systems.

DEP's Interest, A Watershed-Based Approach

In discussions with DEP, it became clear that the review and permitting agency, which is engaged in seminal wastewater research, is not predisposed to one form of technology or another. Rather DEP is eager to explore a new and challenging idea that uses an entire watershed as the basis for analysis and permitting and might employ a number of different methods that are specifically attuned to the geologic and hydrologic conditions of the specific watershed. Termed "watershed-based risk management" the approach might involve conventional sewers, decentralized septic systems, land treatment or combinations. The managing entity could, moreover, be a county, multiple jurisdictions, or a specially created utility. This approach is best summarized in a recent journal article: *A Risk-Based Approach to On-Site System Siting, Design and Management* by Michael I. Hoover, Andrea Arenovski, Donal Daley, and David Lindbo:

On-site system siting and design has traditionally been based upon the specific conditions on the lot in question with little regard to the surrounding environment or the cumulative effect of all on-site systems in the watershed. A newly developed risk-based approach to on-site technologies provides a logical process for qualitatively assessing the risks from on-site systems on a watershed basis utilizing a siting, design and management approach to control these risks. Risk assessment and management begins by ranking the value and vulnerability to pollution of surface water and ground water receiving environments in the watershed. The next step is to develop a two-way table called a ground water and surface water protection matrix. This protection matrix determines the control measures to be used within each receiving environment depending on the value of the receiving environment to the community and its vulnerability to pollution. Control measures include siting criteria, treatment performance standards, system inspection requirements, operation and maintenance activities, and resource impact assessments of the cumulative impacts of on-site systems in the watershed. Periodic system inspection, operation and maintenance and ecological resource assessments are the responsibility of a local or regional management entity. The risk-based approach affords substantial flexibility to the site evaluation and design process; particularly when compared to the prescriptive approaches that are currently used in most state and local codes. This flexibility is possible because of the long-term system monitoring, assurance of maintenance and control of environmental impacts from on-site systems. In essence, the management entity assures that both public health and the environment are protected. Communities can then reliably depend upon both conventional and advanced on-site technologies to meet their long-term waste water treatment needs. This option fits between the two traditional community wastewater infrastructure extremes of poorly maintained conventional septic systems and highly maintained centralized wastewater treatment plants.⁴⁵

⁴⁴ *Ibid.*, p. 220.

⁴⁵ *In Proceedings of the Eighth National Symposium on Individual and Small Community Sewage Systems, 1998, Published by the American Society of Agricultural Engineers, St. Joseph, MI.*

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Staff and consultants met with DEP Harrisburg in December, 1998 to discuss Monroe 2020, DEP's interest in watershed-based approaches, and possible collaboration. Both technical and financial assistance are possible, especially if the County is prepared to play a major role in organizing watershed-wide studies and structuring management entities which might involve multiple municipalities and the County itself. DEP has recommended substantial materials on the approach for County review and is eager to continue a dialogue. Of special interest to the agency are the stormwater management plans prepared for each of the three main watersheds, the Tobyhanna, Brodhead, and McMichaels and adopted by the County. These already contain a wealth of data and analysis on the water resources which can be an excellent basis for the detailed work on wastewater approaches. The Watersheds map on page 91 indicates the location of all County watersheds.

WATERSHEDS
MONROE COUNTY,
PENNSYLVANIA

- LEGEND**
- Stream
 - Water Bodies
 - Municipal Boundary
 - County Boundary
 - Watersheds**
 - Aqueducts Creek
 - Backlund Creek
 - Backlund Creek
 - Cherry Creek
 - Delaware River
 - Lehigh River
 - Mennon/Toxley Creeks
 - Mud Run
 - Mulbachs Creek
 - Polingross Creek
 - Toxley Creek
 - Wallenpaupack Creek



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