Regional Water Management
Task Force

Phase I Report

May - November 2006

Regional Water Management Task Force
Phase I Report

Executive Summary

During the last five years, several excellent studies have offered recommendations for greater coordination of water resource management in southwestern Pennsylvania. These reports provided substantial information and fostered a positive regional dialogue on the issues. The current Task Force was designed to move that dialogue to solutions and implementation.

The challenges southwestern Pennsylvania is facing include:

- the nation's largest concentration of combined sewer overflows (i.e., locations where the combination of stormwater and sewage leads to discharges of untreated sewage in wet weather)
- widespread acid mine drainage, a legacy of the region's long mining history
- increasingly severe flooding, particularly along the region's tributary streams
- aging infrastructure, as reflected by leakage and serious water-main breaks
- overloaded sewage systems in many communities
- septic system failures or illegal discharges of untreated sewage in rural areas
- significant bacterial contamination of rivers and streams

Clearly the story is not all bad. Southwestern Pennsylvania enjoys abundant water resources and has greatly improved its water quality, as evidenced by its attractiveness to events like the Bassmaster Classic. But many other improvements are still needed.

The University of Pittsburgh Institute of Politics's Environment Policy Committee resolved in fall 2005 to initiate a renewed effort to address these issues. In July 2006 it released a framing paper describing southwestern Pennsylvania's most pressing problems with stormwater, sewage, water quality, and flooding. The Environment Committee also established, with the endorsement of the Southwestern Pennsylvania Commission, the independent **Regional Water Management Task Force** with the charge of finding and implementing practical, regionally relevant solutions.

The Task Force's mission is policy-oriented, not technically oriented. In other words, the Task Force seeks not to solve specific technical problems related to water management, but to determine what institutional arrangements may best help the region achieve water resource planning and management improvements and how we can put those arrangements in place.

The Task Force's geographic scope was defined as encompassing 11 counties, and a 17-member task force including representation from all 11 counties was selected. From May through November 2006, as Phase I of its work plan, the Task Force project team carried out research to fill information gaps in our knowledge about water management in southwestern Pennsylvania. The Phase I research did not cover areas where previous studies have already provided substantial information or where public awareness is already fairly strong. Rather, it focused on five areas:

- Extensive benchmarking visits to regions similar to southwestern Pennsylvania that have found ways to manage water and sewage successfully

- A survey of southwestern Pennsylvania's authorities and municipalities
- Detailed case studies to depict how various entities in southwestern Pennsylvania are dealing with their water management challenges
- Assessment of the financial viability of existing entities in the region
- Institutional analysis to identify possible alternatives that have worked elsewhere and that might be useful in this region

This report summarizes the findings of that preliminary research. Among the highlights:

- Benchmarking visits showed that progress in regional water and sewage planning is possible with relatively modest financial investment. It does not necessarily mean consolidating all entities into a single functional body. Water resource management benefits when supported by state regulatory agencies and when interrelated with land-use decisions.

- The survey of authorities and municipalities found that these entities have made over $2 billion in capital investment over the last 10 years; that levels of capital investment vary widely among these entities, as do water and sewer rates; that most customers in southwestern Pennsylvania pay reasonable rates, when compared to national standards; and that there is a correlation between higher levels of capital investment and higher rates.

- Case studies revealed examples of effective water resource management through professional leadership and well-planned coordination. One case study appears to illustrate the problem, believed to be common in southwestern Pennsylvania, of deteriorating infrastructure resulting in part from deferred investment.

- Financial analysis revealed that the great majority of water management entities are in stable financial condition (though their financial statements may not account for problems with aging infrastructure).

- Institutional analysis identified several arrangements that may be viable for southwestern Pennsylvania.

The Task Force recognizes that, given the fragmented nature of water management in southwestern Pennsylvania, any institutional change can occur only after substantial public outreach, discussion, and consensus-building. Phase II of the Task Force's work, scheduled for the first half of 2007, will entail extensive outreach, education, and public-participation activities throughout its 11-county region. If you wish to provide input to the process, you need not wait for us to come to you. Your thoughts and questions are always welcome! The Task Force hopes that these discussions will lead to the development of specific recommendations regarding new institutional or cooperative arrangements and a plan for implementation.

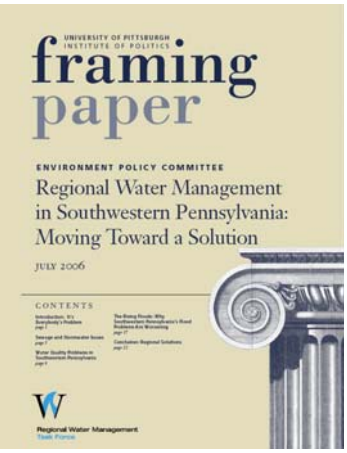
The Problem

It is easy to overlook southwestern Pennsylvania's water-related problems. After all, the region's water quality has improved dramatically, to the extent that the Bassmaster Classic, a national competition for professional anglers, has found Pittsburgh an attractive location. The great majority of the region's residents have safe drinking water and functioning sewage systems; thus they may not perceive our region as having serious problems.

But for the residents whose water is contaminated by acid mine drainage, the recreationalists affected by frequent overflows of raw sewage into our rivers, the communities that have needed emergency water supplies due to pollution or water-main breaks, or the homeowners and businesses victimized by local floods, the problems are all too real.

And the worst problems remain. Southwestern Pennsylvania still has more overflows of untreated sewage than any other region in the country, largely due to combined sewers that draw stormwater unnecessarily into the sewage treatment system. Acid mine drainage, a legacy of the region's long mining history, has occurred from Fayette County to Pittsburgh's Hill District. Our waterways are among the most severely impacted by bacteria and pollution anywhere in the U.S. Many of our rural areas face acute water-related challenges, particularly where soil content is unfriendly to on-lot septic systems. Hurricane Ivan provided the most memorable demonstration, but far from the only one, of our region's increased vulnerability to flooding.

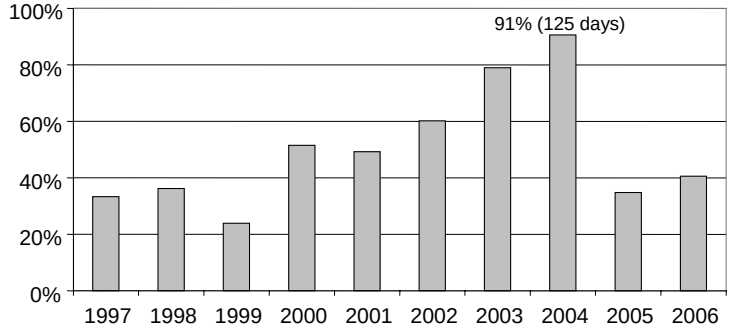
During the last five years, a number of excellent studies and respected organizations have offered recommendations for greater coordination of water resource management in southwestern Pennsylvania. In December 1999, the Southwestern Pennsylvania Commission held a day-long conference to highlight sewage-related problems and solutions. Since then, reports by 3 Rivers Wet Weather (2002), the Pennsylvania Economy League of Southwestern Pennsylvania's Investing in Clean Water Steering Committee (2002), the National Research Council (2005), and students in the H. John Heinz III School of Public Policy and Management at Carnegie Mellon University (2005) have all urged greater regional cooperation in water management. These reports provided substantial information and fostered a positive regional dialogue on the issues. The current Task Force was designed to move that dialogue to solutions and implementation.



The University of Pittsburgh Institute of Politics's Environment Policy Committee members, many of whom were involved in those prior studies, believe that **the region's water management needs must continue to be addressed**. For this reason, in July 2006, the Environment Committee released a 23-page **framing paper** describing southwestern Pennsylvania's most pressing problems with stormwater, sewage, water quality, and flooding. (Contact the Institute of Politics at 412-624-7792 or iopadmin@pitt.edu for a copy of the framing paper. It can also be accessed on the Institute of Politics web site at www.iop.pitt.edu/water.) Here are a few of the observations contained in this framing paper:

- Stormwater runoff, deteriorated conveyance pipes, and outdated treatment systems pollute the region's groundwater, rivers, and streams so heavily that much of their water is in violation of federal water quality standards.
- Sewage overflows make Pittsburgh's rivers unsafe for recreational contact up to 125 days each year. This is more than just an inconvenience to boaters; it is a public health hazard.

Percent of Boating Season Unsafe, Allegheny County (May 15-Sept. 30) [1]



- The region's floods are not simply "natural" disasters; building on and paving over more land area has caused the chances of flooding to increase.
- Acid mine drainage and industrial pollution seriously compromise many of the region's water sources.
- In dozens of communities throughout southwestern Pennsylvania, development is constrained by the lack or inadequacy of wastewater treatment systems.
- There is no comprehensive knowledge of existing water systems. An attempt to develop a comprehensive mapping after the Ashland Oil spill crisis of 1988 quickly stalled.

The Environment Committee also established the independent **Regional Water Management Task Force** with the charge of finding and implementing practical, regionally relevant solutions. The Southwestern Pennsylvania Commission (SPC) endorsed the project in March 2006. The ten SPC counties (Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Washington, Westmoreland) plus Somerset County were defined as the project's geographic scope. As a result of recommendations from county commissioners, a 17-member task force including representation from all 11 counties was selected. Carnegie Mellon University president Jared Cohon agreed to chair the Task Force, with California University of Pennsylvania president Angelo Armenti as vice-chair. With the establishment of an independent Task Force, SPC's endorsement, and the creation of a regionally diverse Technical Advisory Committee to assist the Task Force, the Environment Committee is now part of a broader group of entities within the region seeking to move toward solutions.

The Task Force's mission is policy-oriented, not technically oriented. In other words, the Task Force seeks not to solve specific technical problems related to water management, but to determine what **institutional arrangements** may best help the region achieve water resource planning and management improvements and how we can put those arrangements in place. Phase I of the Task Force's work entailed research to build on the information available from previous regional studies. This report describes the results of Phase I and the Task Force's plans for public and stakeholder engagement leading up to specific recommendations during Phase II.

Determining the Research Scope

Previous studies on water and sewage issues in southwestern Pennsylvania have effectively described the region's problems, outlined briefly how some other regions have addressed their water management issues, and suggested possible approaches to regional planning and advocacy.

The Task Force considered what additional information, obtainable within four months, could contribute to a fuller knowledge of how southwestern Pennsylvania's systems operate and options for improving them. They decided that useful information could be obtained in five ways:

- Extensive **benchmarking** visits to regions similar to southwestern Pennsylvania that have found ways to manage water and sewage successfully
- A **survey** of the region's authorities and municipalities
- Detailed **case studies** to depict how various entities in southwestern Pennsylvania are dealing with their water management challenges
- Assessment of the **financial viability** of existing entities in the region
- **Institutional analysis** to identify possible alternatives that have worked elsewhere and that might be useful in this region

The next five sections of this report discuss the results of these investigations. It should be noted that, as this research was designed to fill information gaps, Phase I did not concentrate significantly on some regional problems that are already widely acknowledged, such as acid mine drainage and increased flooding risks.

Benchmarking

The Task Force project team evaluated 13 metropolitan regions using measures of innovation in water management and similarity of the region to southwestern Pennsylvania. The Task Force then selected four regions for review, based on their quality of performance in addressing issues similar to those that southwestern Pennsylvania faces. During July and August, project manager Ty Gourley and research team member Zach Falck conducted on-site visits and interviews in the **Atlanta, Cleveland, Milwaukee, and Minneapolis-St. Paul** regions**.** Extensive (10 pages each) summaries of what they learned on these visits are available on request. Some key conclusions follow:

- *Regional water management does **not** necessarily mean consolidating all entities into a single functional body*. It does entail bringing representatives from government, utilities, environmental groups, and business interests together to discuss regional matters and to introduce regional perspectives into their organizations.

- *Regional water management and land use are deeply interrelated*. Other regions have found that, if land-use planning does not take water resource management decisions into account, water quality can be difficult to preserve and flooding risks can remain. When individual municipalities allow development without regard for the regional environmental impact of their projects, the benefits of regional water management plans

are compromised. For this reason, successful regional water management depends on some means of ensuring that local plans are consistent with regional plans.

- *Regional water management has existed for a long time in other metropolitan areas.* Three of the four regions studied designated entities as their Areawide Water Quality Planning Agencies under the Federal Clean Water Act in the 1970s. Ever since then, they have had experts developing detailed plans for regional collaboration in water management. The fourth region, Atlanta, created its planning entity in 2001 and quickly completed a comprehensive, multi-county water management plan within four years. By comparison, in southwestern Pennsylvania, no local entity holds similar regional responsibility, and thus the management of water resources remains less fully coordinated.

- *All four regions have means, some of them very modest, to generate local revenue for water resource planning.* More than half the Atlanta regional planning entity's 2006 budget came from an annual per-capita assessment of 15 cents. In the Milwaukee area, a regional tax levy of about a dollar per person funds all regional environmental planning. Cleveland's metropolitan planning organization (MPO) devotes a portion of member counties' dues to water planning. The Minneapolis-St. Paul Metropolitan Council generates revenue by actually operating most of its region's wastewater treatment facilities. Though these organizations may have depended on state or federal funding in their initial stages, their ongoing activities rely mainly on local revenue collection.

- *Substantial efficiency and savings can accrue if a single entity can provide integrated leadership in transportation and water infrastructure development.* However, bundling these functions also can lead to budget squabbles over reserve funds.

- *In all four regions, state government supports regional water planning and management by delegating facilities and infrastructure planning to regional planners and by reinforcing their decisions with state regulatory powers.* The regional entities try to work cooperatively with local governments on plan development rather than using their position to compel compliance, but localities generally recognize that the state will deny permits or funding to municipalities that disregard regional plans. Thus the regional planning organization is able to guide efficient infrastructure investment and to advance sustainable local development. Representatives of the benchmark regions believe that the existence of such an intermediary organization is crucial to the implementation of water and sewage management plans that meet both regulatory requirements and regional goals. Regionwide planning processes have resulted in greater collaboration with state and federal environmental agencies and have reduced the risk of adverse regulatory actions.

The chart on the next page provides an overview of the regional water management entities in the benchmark regions.

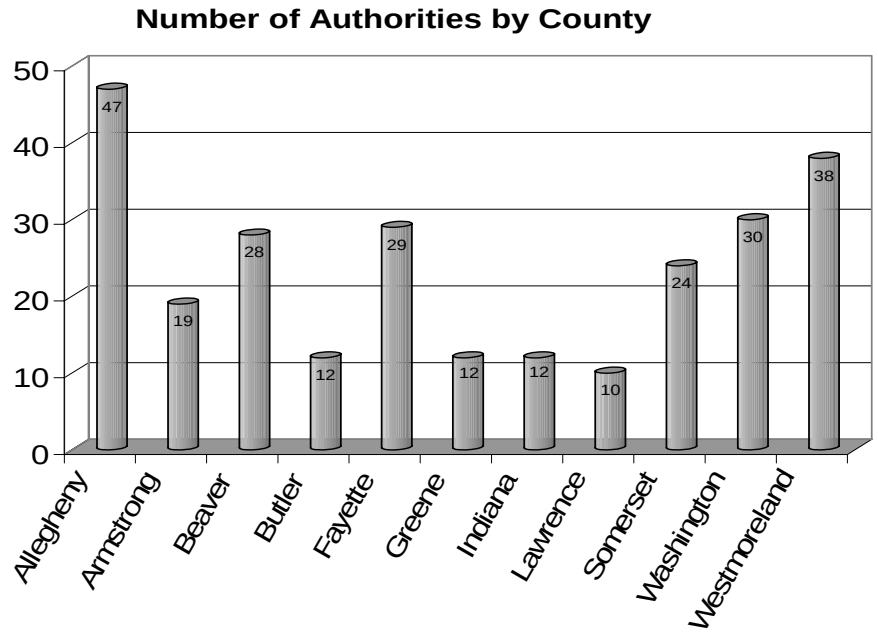
Region	Atlanta	Cleveland	Milwaukee	Minneapolis-St. Paul
Created by	State government	State government	State government	State government
Why	Water quality and supply problems	Governor/Local MPO's interest	Local MPO's interest	Water pollution problems compelling federal action
Size	16 counties, 4 million people, 5,150 sq. mi.	5 counties, 2.1 million people, 2,005 sq. mi.	7 counties, 1.9 million people, 2,689 sq. mi.	7 counties, 2.6 million people, 2,970 sq. mi.
Staffing	Atlanta Regional Commission and other regional agencies	NE Ohio Area Coordinating Agency environmental planning unit	MPO's water resource planning staff	680 Metropolitan Council Environment Services staff
Funding	Local dues (per-capita assessment), some grants	Local dues	90 percent from local levy	Wastewater service fees
Regulatory powers	Noncompliant communities lose eligibility for state funding; permit applications must conform to district plans	No permits given if inconsistent with NOACA plan	No permits given if local plan or sewer extension proposal inconsistent with MPO plan	Manages wastewater treatment; local plans cannot conflict with regional plan; role in determining where development will occur
Significant successes	Regionwide plans for wastewater capacity, water supply, conservation; comprehensive stormwater plan and model ordinances; wastewater plan that will eliminate 61 plants	Sewer service area delineation; improvements in stormwater planning, and in stormwater control at development sites; septic tank management regulations	Assisted treatment plants to merge; regional water quality management and water supply plans; coordination with land-use planning	Regional water supply plan; program to reduce inflow and infiltration; high level of wastewater treatment regulation compliance

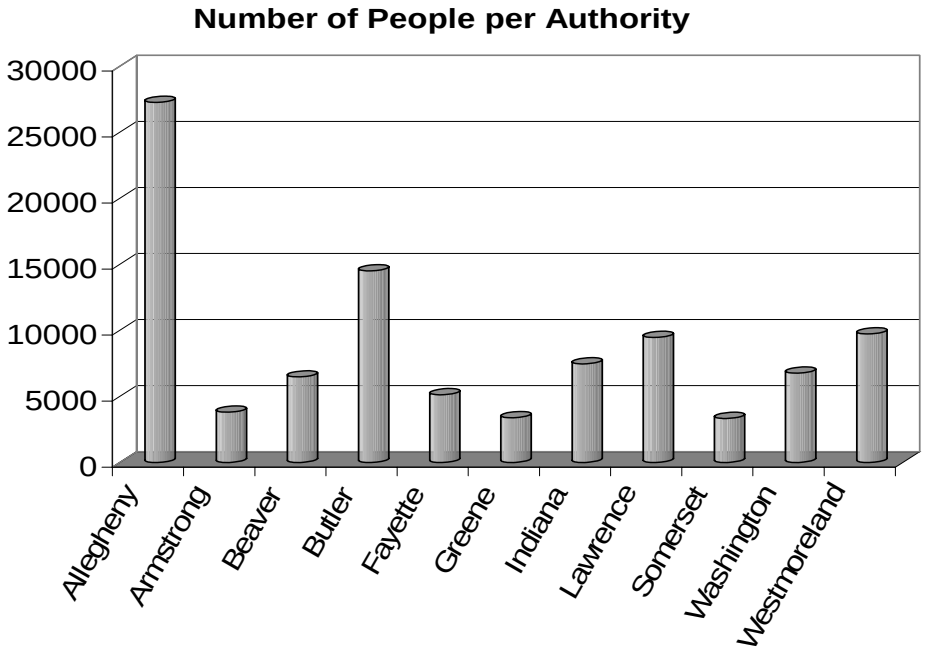
Survey

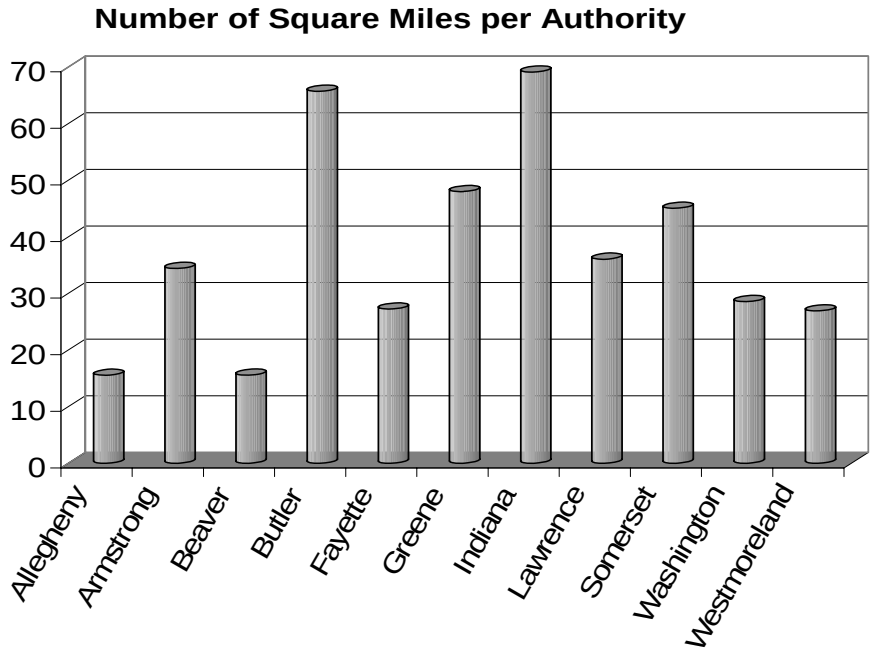
The Task Force sent surveys to 268 water and sewer authorities and all 601 municipalities in the 11-county region. Phone follow-up was used to encourage survey return and to obtain clarifying or additional information from some respondents. Overall return rate was 40 percent. Findings include:

- *Who's involved?* Water management is handled primarily by water and sanitary authorities, though one-seventh of the municipalities responding indicated that they have a role in water or wastewater management. About 55 percent of the authorities handle sewage only, 25 percent deal with drinking water only, and just 20 percent manage both drinking water and wastewater.

- *How much collaboration?* The sheer number of separate authorities is imposing. Allegheny and Beaver Counties each have one authority for every 15.5 square miles of land. Greene and Somerset Counties, despite the fact that many of their residents still rely on private water wells and/or septic systems, have one authority for every 3,300 residents. Nearly 30 percent of authorities serve a single municipality, and fewer than one-quarter serve more than four municipalities. On the other hand, collaboration among numerous municipalities does exist at various locations throughout the region. The involvement of 83 communities in the Allegheny County Sanitary Authority (ALCOSAN) is widely known, but 10 or more municipalities are also represented in the Municipal Authority of Westmoreland County; Highridge Water Authority (Indiana County); Indiana County Municipal Services Authority; North Fayette County Municipal Authority; Southwestern Pennsylvania Water Authority (Greene and Washington Counties); and Authority of the Borough of Charleroi (Washington and Westmoreland Counties).







- *How old is the infrastructure?* Of 104 authorities answering this question, over one-quarter have infrastructure that predates 1950; six reported having infrastructure that was first built in the 1800s. At the newer end, 10 percent of the authorities are managing no infrastructure that existed before 1990, reflecting both the provision of public water and sewer lines to established residences and the continued expansion of development despite lack of regional population growth.

- *How big are the capital investments?* Estimates that our region may need to spend $10 billion or more on water infrastructure improvements are seldom compared to what we are already spending. The survey asked respondents to indicate the amount expended on capital improvements over the last 10 years. Among the 120 authorities and municipalities answering this question, total expenditures exceed $1.15 billion. Since this figure does not include data from some of the largest authorities or from private companies such as Pennsylvania-American Water, **the total amount of capital expenditures for the region over the last 10 years can be estimated as in excess of $2 billion.** A search of the Pennsylvania Infrastructure Investment Authority (PENNVEST) web site found that the total value of PENNVEST funding alone for projects in the 11 counties since 1997 has exceeded $800 million.

Estimated PENNVEST Expenditures by County, 1997-2006[2]	
Allegheny	95,280,000
Armstrong	53,371,000
Beaver	70,476,000
Butler	65,844,000
Fayette	99,452,000
Greene	36,805,000
Indiana	44,034,000
Lawrence	44,259,000
Somerset	78,543,000
Washington	76,784,000
Westmoreland	154,135,000
TOTAL	818,983,000

  The level of capital investment appears to vary remarkably. At one extreme, several authorities covering relatively modest geographic areas have undertaken projects worth $30 million or more, usually for sewage infrastructure expansion. In nine such cases the amount of capital investment per customer was more than $8,000. At the other extreme, several authorities, primarily from established but small rural communities, insisted that they have spent $100,000 or less on capital improvements over the past decade. It appears that these authorities have limited their capital investment to essential repairs needed to keep the system operating.

- *Who's running these entities?* Almost exclusively, authorities are governed by municipally appointed, five-member boards. Slightly over half of board members work in the private sector; over one-third are retired. (The actual percentage of retired persons is probably even higher, as the survey did not offer "retired" as a reply option but many respondents wrote this information in on the "other" line.) Interviews and anecdotal information suggest that finding qualified authority board members is often a challenge.

- *Who's working here?* On average, authorities and municipalities involved in water management employ 9 full-time and one or two part-time employees; the great majority have an engineer and solicitor on consulting contracts, usually lasting two years. Over two-thirds report that their average employee age is 45 or higher, suggesting the need to replace an aging workforce—or to reduce staff needs through consolidation of systems—in upcoming years.

- *What are the top operational priorities?* Respondents were asked what they consider the most important criteria in assessing organizational effectiveness. Of the seven options presented, efficiency/cost received the highest ranking overall, with environmental protection a fairly close second and accountability third. These were followed in order by leadership, security, equity, and regional competitiveness.

- *Where are the overflow problems?* Thirty-three authorities or municipalities indicated that they have combined sewers, out of 111 answering this question (30 percent). Of these 33, 29 said they have combined sewer overflows (CSOs), and seven indicated that they have 16 or more permitted overflow locations. As a reflection of the regionwide nature of the CSO problem, these seven authorities are located in four different counties: Allegheny, Fayette, Indiana, and Westmoreland. (Previous studies have determined that southwestern Pennsylvania has over 700 permitted CSOs, easily the greatest number of any region in the United States.)

CSO Outlets by County[3]	
Allegheny	413
Armstrong	18
Beaver	17
Butler	0
Fayette	72
Greene	2
Indiana	22
Lawrence	1
Somerset	15
Washington	76
Westmoreland	127
Total	763

- *What are authorities and municipalities concerned about?* Respondents were presented with one open-ended question: "What are the greatest challenges your organization faces?" Infrastructure, financial, and regulatory challenges were cited with roughly equal frequency. Many respondents pointed out the interrelationship among these issues, as aging infrastructure and regulatory requirements lead to financial strains. Numerous authority representatives expressed concern about the costs and benefits related to state and federal environmental requirements. As one sewage facility manager indicated, "Our greatest challenge is dealing with unreasonable and unnecessary changes in regulations that will require millions of dollars in plant improvements with little or no improvement in water quality released from our treatment plant."

  Several communications hinted at some sensitivity regarding the purpose of a regionwide task force. At least two authority boards took the unusual step of officially voting not to respond to the survey. A well-respected suburban sewage facility manager noted concerns that authorities like his might be pushed toward "regionalization" in the form of consolidation with or takeover by another entity. (In some cases, direct interaction with the project team has allayed concerns that the Task Force has a predetermined consolidation plan in mind.) On the other hand, the chairman of an authority near several established river communities pointed out the existence of six separate authorities in an eight-square-mile area. He wrote, "We feel strongly that there are too many authorities. More regionalization or merger is needed. Counties should consider countywide authorities to better serve and contain costs."

Case Studies

The Task Force research team sought to identify a variety of entities for intensive case studies. Three studies have been completed so far, and others are ongoing. The cases summarized below include a county-sponsored authority of wide-ranging scope (Indiana County Municipal Services Authority); a municipality recognized for high-quality planning, management, and accountability (Cranberry Township); and an older, urban entity.

Indiana County Municipal Services Authority

The Indiana County Municipal Services Authority (ICMSA) began operations in 1973 as a full-service water and sewage authority. It now owns and operates 14 water supply and 15 wastewater systems, serving a large portion of Indiana County and smaller parts of Armstrong, Clearfield, and Cambria Counties.

Initially, the ICMSA experienced skepticism in many of the communities it was designed to serve, but over 15 years its operational successes led to increased public support, and eventually to requests from various communities to affiliate with the authority. The ICMSA has invested over $100 million in capital improvements, including more than 500 miles of pipelines, and has received recognition for improving water quality in its watersheds through the use of filtration systems and settling ponds.

The ICMSA has effectively addressed serious deficiencies in sewage management within the county. For example, complaints about sewage seeping into a stream in the town of Marion Center led to an ICMSA project accommodating about 250 customers. More recently, the ICMSA took over drinking water management for the borough of Cherry Tree after that community negotiated a consent order with the state Department of Environmental Protection. Cherry Tree's water system had been suffering extremely high amounts of leakage, in part because the acidic soil common in northern Indiana County was eroding pipes. ICMSA repair activities have reduced Cherry Tree's total water usage by more than half. The Marion Center and Cherry Tree regional efforts each benefited from PENNVEST funding assistance.

The ICMSA's collaborative leadership again paid dividends when the state Department of Corrections sought to build a new prison in Indiana County and needed water and sewer access. The ICMSA's planning role not only made prison development possible by building state-of-the-art water and sewer facilities but also, as part of the project, delivered excellent services to four neighboring municipalities.

As is common in less densely populated areas pursuing infrastructure upgrades, ICMSA customers pay relatively high water rates of about $40 per month. Some of the first communities served by the ICMSA had been dependent on antiquated systems originally built by mining companies and were happy to pay increased rates for reliable, clean water. Sewage rates within the ICMSA service area are close to the regional median, at either $37.50 or $42.50 per month.

Regional management of 29 plant locations leads to operational efficiencies, as each plant does not require its own operator. Rather, the ICMSA deploys 14 staff in a circuit-rider system to visit and oversee each plant's operations regularly.

Overall, ICMSA leadership believes that collaborative water and sewage management has provided the following benefits:

- Centralization of management
- Centralization of operation and maintenance
- Shared equipment, tools, and technical resources

- Shared and common operating fees
- Elimination of shortsighted municipal interests
- Encouragement of planning
- Encouragement of stewardship of natural and human resources

The ICMSA represents a prominent southwestern Pennsylvania success story in solving pressing sewage problems and providing quality of service affordably through professional leadership and economies of scale.

Cranberry Township

Rapidly growing Cranberry Township, Butler County, is recognized as an example of effective municipal-level water management; it also illustrates one potential drawback involved in delegating water resource responsibilities to unelected, largely unnoticed authorities.

Cranberry had an independent water and sewer authority until 2001, at which time the authority was dissolved and merged into the township's operations. According to township manager Jerry Andree, this organizational change resulted in more efficient operations and clearer lines of accountability.

Prior to the township's merger with the authority, in the mid-1990s, operating permit violations caused the state Department of Environmental Protection to impose a moratorium on new tap-ins to the sewage system. The authority, township, and DEP negotiated a consent decree that restored tap-in access, provided that certain milestones were achieved. However, the township government became sufficiently dissatisfied with the authority's performance that, as the terms of existing authority board members expired, the township appointed members of its own Board of Supervisors to the authority board. Organizational changes were then implemented, beginning with a management agreement under which the township administered the authority's day-to-day affairs, and culminating in dissolution of the authority. Andree estimates that the dissolution of the authority saved Cranberry $100,000 a year in administrative costs.

Among the improvements the Township has initiated since then is an advanced infiltration and inflow program for its sanitary sewer system. This comprehensive program includes systematic monitoring of interceptor and collector systems to identify extraordinary flows, followed by internal television inspections and the use of appropriate repair technology. The Township has also implemented a program to manage and eliminate sources of fats, oils and greases (known as FOG) from the sanitary sewer system. In addition, since the township assumed control of drinking water operations, its inspection and repair program has reduced water losses from 27 percent to 9.5 percent of total water used.

Along with rigorous budgeting and performance measurement procedures, Cranberry Township pursues enhanced quality by participating in a network of organizations, called Qualserve, that seeks to identify best management practices. This benchmarking network focuses on performance measures in five areas—organizational development, customer relations, business operations, water operations, and wastewater operations—and is used by several other water and sewer operations across the Commonwealth. As an example of improved practices emerging

from this network, Cranberry has identified and carried out recommended steps to reduce undesirable odors emanating from a treatment plant.

Finally, Cranberry Township government strongly emphasizes open, two-way communication with its residents and believes that this open communication helps to produce an efficient management process.

A Smaller Urban Authority

The Task Force examined the water and sewer authority serving a small, relatively densely developed community. This authority charges below-average water rates and roughly average sewage rates.

Until 2005, the borough council owned and operated the community's water system. In 2005, facing an estimated $10 million cost for system upgrades, the borough transferred water and sewage collection system operating responsibility to the authority.

The water system's holding tanks have deteriorated to the point where, based on visual inspection, a rupture would seem possible. Two studies (conducted 40 and 10 years ago, respectively) recommended repair or replacement of several tanks, but no action was taken on either occasion. The authority does, should a rupture occur, have a contingency plan consisting of enough reserve water to last 4-5 days, followed by reliance on interconnections with a neighboring community.

Water pipes are up to 100 years old and are also in need of repair. In a three-week period during fall 2006, six line breaks occurred. In the past, such breaks have been patched, but these repairs do not appear sufficient to maintain the aging system adequately.

The total estimated cost of needed water system improvements is $25 million.

Happily, the sewage system is in better condition, but sanitary and storm drainage are combined, resulting in overflows of untreated sewage during periods of high-volume flow. The state Department of Environmental Protection has not yet pressured the authority to correct this combined system.

The authority is now considering the possibility of a substantial, long-term loan to finance needed repairs. However, given the proposed project's high cost and the community's modest economic condition, the Authority is also contemplating other options, such as merger with other systems and/or the purchase of water from other sources.

This case study is believed to be typical of many locations in southwestern Pennsylvania where deferred investment presents three risks: system failure, regulatory noncompliance, and (sooner or later) significant rate increases.

Financial Analysis

Audit Review

The research team's financial specialists examined audits of 40 of the largest authorities in southwestern Pennsylvania, along with the financial data that dozens of entities submitted voluntarily with their surveys. Key financial ratios were computed for the 40 selected authorities and compared to ratios in benchmark regions. (Audits of municipalities directly involved in water resource management were not examined, because water and sewage operations are subsumed as individual line items within broader municipal budgets and do not provide sufficient information for detailed analysis.)

The research determined that, with very rare exceptions, water and sewer authorities appear to be in stable financial condition. However, in some cases the impression of stability may be incomplete, because audit data may not reveal the presence of declining infrastructure that would require significant capital investment to repair (as exemplified by the smaller urban authority case study above). The quality of service and environmental quality of the area served are two other factors not yet taken into account in these analyses.

More intensive examination of water and sewage management entities' financial practices is scheduled for Phase II of the Task Force's work.

Rate Review

Interestingly, the rates charged by southwestern Pennsylvania water and sewer systems are not nearly as predictable as the entities' financial condition.

Because systems use widely varying billing methods (some charge a flat rate, some charge a base fee plus an amount based on usage, and others bill for usage only), the Task Force followed the practice used in 3 Rivers Wet Weather, Inc. rate surveys of comparing costs for residential use of 5,000 gallons of water per month. On this basis, **sewage rates range from a low of about $40 per three months to a high of about $210, with an average of $98 and a median of $90 per quarter. Drinking water rates exhibit less variance, ranging from about $65 to $125 per quarter.**

Survey data show a strong correlation between high levels of capital investment and high rates. Of 76 sewage authorities reporting rate data, the 10 with the highest rates include eight with major capital investments, ranging from $4,000 to over $15,000 *per customer* during the last 10 years. (In the case of combined sewer-water authorities, half the total reported capital investment is assumed to be for sewers.) The other two systems among the highest ten rates are relatively small but established authorities in outlying communities.

Two other patterns emerge from analysis of this group of sewage authorities. First, **many of the lowest rates occur in urban areas with long-established infrastructure and declining tax bases**; on the other hand, the highest rates tend to occur in outlying areas that have constructed their public water or sewage infrastructure more recently. Second, **larger authorities and**

municipal systems tend to charge lower rates: of the 25 authorities with more than 4,000 customers, 20 charge less than the median rate. This tendency, however, may result more from the denser populations of many large systems than from economy of scale.

Institutional Analysis

During its second phase, the Task Force will be encouraging broad discussion of whether regional water and sewage management should continue in its current form or should be reshaped in some way. To prepare for this phase, the Task Force project team conducted an institutional options analysis. That is, they attempted to categorize the approaches applied or considered elsewhere so that these options can be usefully compared to the status quo. The project team also developed a set of criteria by which various institutional arrangements can be judged. Eight criteria were identified: efficiency/cost, sustainability, accountability, leadership, security, equity, regional competitiveness, and political feasibility. During Phase II, the Task Force will ask stakeholders and the public to evaluate the appropriateness of the criteria and to participate in assessing how well each institutional option could advance the effectiveness of the region's water and sewage systems with regard to each criterion.

The Task Force observed that three important dynamics affect the nature of regional water resource leadership: (1) whether regional leadership is entrusted to a single entity, multiple entities, or no entity at all; (2) whether regional leadership is responsible for water and sewage *planning* only or also becomes involved to some extent in actual *operations*; and (3) whether regional leadership is taken by the region's metropolitan planning organization or by some other entity. In accordance with these dynamics, the Task Force identified six distinct options for discussion purposes, as follows:

- **Decentralized collaboration**, under which numerous entities are responsible for activities within their own boundaries and collaborate voluntarily as they see fit. This approach currently prevails in southwestern Pennsylvania.
- **Multiplicity of entities within the region participating in cooperative water resource planning.** Planning organizations could each be responsible for their own county or watershed and could also come together to allocate available funds or to address issues of regionwide relevance. The various entities involved in water resource planning in the San Francisco Bay Area function in this way.
- **Multiplicity of entities within the region taking on planning and management roles.** Under this scenario, county or watershed entities would be operators as well as planners. This approach is illustrated by the Indiana County Municipal Services Authority or by the network of countywide authorities recently established to rebuild the Mississippi Gulf Coast's water infrastructure. Again, these entities could jointly convene to discuss issues of regional relevance.
- **Centralized water resource planning role vested with the regional metropolitan planning organization (MPO).** The MPOs in Cleveland and Milwaukee fill this function, and previous studies have suggested that the Southwestern Pennsylvania Commission similarly become the hub for regional water planning here.

- **Regional planning and management roles vested with the regional MPO, SPC.** This model appears in Minneapolis-St. Paul, where the Metropolitan Council operates the sewage treatment system as well as guiding regional water planning.
- **Regional planning and various management roles vested within an existing or newly created entity.** This model appears in the Atlanta region, which created a new regional water district to guide its water resource decision-making.

Key Conclusions and Observations from Phase I

- The Task Force has observed a wide range of attitudes toward the way in which southwestern Pennsylvania is currently organized to manage its water resources. Some are very proud of the excellent work they do for their communities and want to maintain institutional arrangements that permit them to do this work locally. Others wonder why there are so many separate entities and urge improved cooperation or even consolidation.

- The benchmark regions have gained financially, in efficiency of infrastructure investment, and in environmental quality through more clearly defined means of regional cooperation than currently exist in southwestern Pennsylvania. However, getting to that level of cooperation was not an easy process, entailing regionwide funding agreements and state legislation.

- The evolution of the benchmark areas from fragmented water management systems to more coordinated regions occurred over a period of years. An elected official in one benchmark area warned not to "oversell regional solutions for water management; all that can be hoped at first is to give regional coherence to what is truly a regional problem." New institutional arrangements in southwestern Pennsylvania will not solve our daunting problems immediately, but can contribute to gradual and long-lasting progress.

- Achieving efficient use of existing infrastructure and new investment dollars is difficult without some means of influence in localities' land-use decisions.

- Some authorities and municipalities in southwestern Pennsylvania have invested aggressively in water and sewage infrastructure improvements, while others are making minimal investment even when the deterioration of infrastructure is apparent.

- Some communities in southwestern Pennsylvania, usually those where significant recent investment in infrastructure improvements has taken place, are paying relatively high water and/or sewage rates, but most are paying reasonable rates by national standards.

- Anecdotal reports indicate that citizens are generally willing to support rate increases when they know the money will be used to correct an identified problem such as untreated sewage or malfunctioning septic systems.

- In its considerable interaction thus far with local leaders and stakeholders, the Task Force has found a high level of concern about southwestern Pennsylvania's water resource problems, and a high level of energy and commitment to improving the situation. At the

same time, the Task Force is cognizant that—absent a serious crisis or decisive action by the General Assembly—considerable public engagement and consensus-building will be needed to achieve broad support for any change in the region's approach to water resource planning and management.

What's Next?

The Task Force recognizes that, given the fragmented nature of water management in southwestern Pennsylvania, **any institutional change can occur only after substantial public outreach, discussion, and consensus-building.** Accordingly, Phase II of the Task Force's work plan will feature an energetic effort to acquire more complete information about existing systems, educate the general public about our water resource needs, and solicit regionwide public input.

During the next six months, the Task Force plans to carry out **extensive outreach, education, and public-participation activities** throughout its 11-county region. Additional information will be obtained from authorities, municipalities, regulatory agencies, elected officials, technical specialists, watershed organizations, and other sources. The Task Force will also hold public meetings to explain southwestern Pennsylvania's water resource needs and obtain feedback. As the region's citizens become better educated about the current situation and possible institutional arrangements to address our problems, they will be invited to discuss the criteria by which the region should measure its success in water management and then evaluate various options using those criteria.

These discussions are designed to lead to the development of specific recommendations regarding new institutional or cooperative arrangements and a plan for implementation.

Phase II will also include examination of **rural infrastructure** issues. Nearly one-fourth of the municipalities responding to the Task Force's survey rely on private wells and/or private septic systems. Many of these may face pressure to link to public systems due to development activity or environmental concerns. However, installing new infrastructure in sparsely populated areas can be extremely expensive per customer. The Task Force will seek to understand the decisions facing these rural communities and whether any assistance or collaboration could improve the efficiency and sustainability of new infrastructure investment.

If you wish to have a voice in southwestern Pennsylvania's water resource management future, you **need not wait for us to come to you**. Your input or questions are always welcome! Feel free to contact Task Force project manager Ty Gourley at (412) 624-7792 or dtg9@pitt.edu. He can also put you in contact with Task Force board and technical advisory committee members who represent your professional discipline, geographic area, or topic of particular interest.

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[1] *SOURCE:* Allegheny County Department of Health web page, http://www.achd.net/. Detailed 2006 statistics are available at: http://www.achd.net/pr/riveradvisory.htm.
[2] *SOURCE:* Pennsylvania Infrastructure Investment Authority web page, http://www.pennvest.state.pa.us/.
[3] *SOURCE:* Pennsylvania Department of Environmental Protection Combined Sewer Overflow List, http://www.dep.state.pa.us/eps/docs/extras/TG/Finals/wswm/CSO_LIST.xls.

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Technical Advisory Committee

The Technical Advisory Committee consists of individuals from a wide range of stakeholder groups who have expertise relevant to the Regional Water Management Task Force's purpose. These individuals will be consulted during the Task Force's work and will be invited to review Task Force reports and offer their input prior to the reports' publication.

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