

3 Rivers Wet Weather

Basin Group Guide

on the Wet Weather Issue in Southwestern Pennsylvania

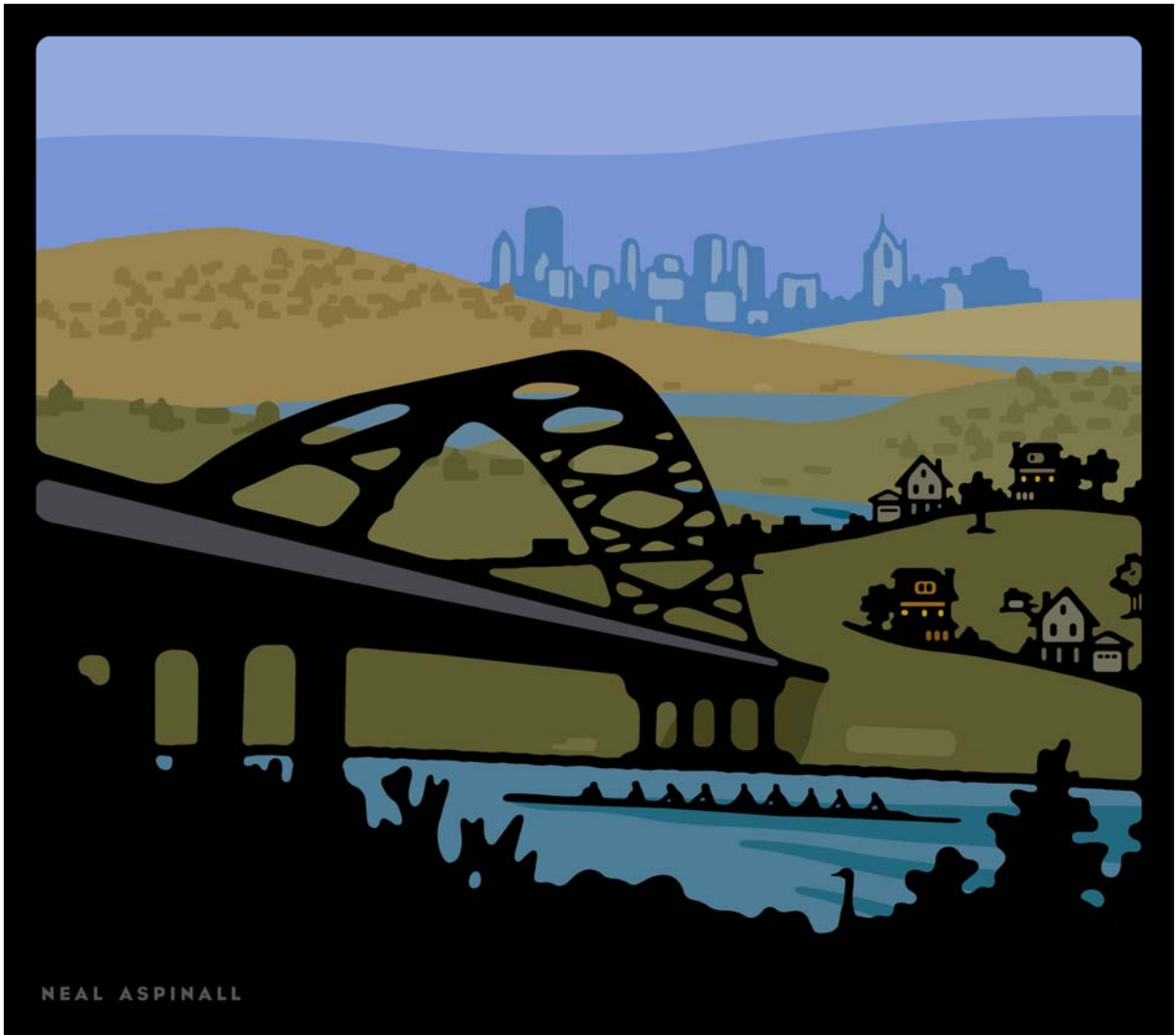


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Background on the Wet Weather Issue

The Pittsburgh region's frequent rainfall brings an underground, out-of-sight problem into clear view. As little as one-tenth of an inch of rain—an average Pittsburgh rainfall is one-quarter inch—can cause raw sewage to overflow into our rivers and streams. Melting snow can cause the same effect.

During dry weather, the sewage collection system, which transports wastewater from thousands of homes to the wastewater treatment plant, operates effectively. However, when it rains or snow melts, extra storm water gets into the sewage collection system through direct connections or leaky, cracked pipes. This extra volume of water overloads the sewage collection system pipes causing billions of gallons of sewage and polluted storm water annually to discharge from more than 745 sewer overflow structures into our region's rivers and streams. In addition, overflows occur through manholes or in homeowners' basements.

This extraordinary degree of pollution imposes steep environmental, human health and economic costs to citizens of the City of Pittsburgh and the surrounding 82 suburban municipalities served by the Allegheny County Sanitary Authority (ALCOSAN) and its single publically owned treatment works (POTW).

Sewage overflows present a public health risk. While exposure to disease-causing organisms, such as giardia or cryptosporidium, are not considered fatal for a healthy adult, they can be deadly for those with weaker immune systems, the elderly and small children. In addition, Pittsburgh's three rivers serve as the main source of drinking water for more than a million Allegheny County residents. While the public water systems do an excellent job of purifying water before sending it to homes, source protection is the cheapest and most effective way to ensure drinking water quality.

During the recreational boating season, May 15-September 30, Allegheny County issues river advisories to warn individuals using the rivers to limit water contact when sewage overflows have likely contaminated the water with bacteria and viruses. Each time a river advisory is issued, it could last for several days after a rainfall. Since the program began in 1995, river advisories issued by the Allegheny County Health Department have been in effect for nearly 50% (70 days) of each recreational season.

Water is an important resource for the economic development of the Pittsburgh region and sewage overflows hinder growth. Because these overflows violate the Clean Water Act, regulatory agencies, such as the U.S. Environmental Protection Agency (EPA) and PA Department of Environmental Protection (DEP), will not permit municipalities to add new connections to the existing sewer system until the overflow problem is fixed. This restriction limits the construction of new businesses and homes in many communities throughout the region.

This multi-billion problem is best addressed collectively, as the current fragmented system of government wherein 4,000 miles of deteriorated sewage collection system is operated and maintained by 83 entities obstructs the development of a long-term, sustainable solution. Since 2004, communities have been working to comply with a uniform consent order that requires

municipalities to make critical repairs, map their collection systems, assess their system condition through CCTV work, perform dry and wet weather flow monitoring, complete alternatives analysis (feasibility studies) and work with ALCOSAN on a long-term wet weather control plan.

In 2008, ALCOSAN signed a consent decree, an agreement with the EPA, DEP, and the Allegheny County Health Department (ACHD) for ALCOSAN to achieve compliance with the Clean Water Act during periods of wet weather. To comply with the Consent Decree, ALCOSAN must meet a series of requirements for planning, design and construction, operation and permitting, and the development of a long-term control plan with their 83 service communities.

About 3 Rivers Wet Weather

3 Rivers Wet Weather, Inc. is a non-profit environmental organization committed to improving the quality of Allegheny County's water resources by helping municipalities address the issue of untreated sewage and storm water overflowing into the region's waterways. To promote the most cost-effective, long-term, sustainable solutions, 3RWW cultivates regional approaches to decision making, coordinates regional compliance activities, develops regional tools to support municipalities, educates the public and advocates inter-municipal partnerships.

3RWW, founded in 1998, has a five-member Board of Directors, along with advisory panels, working groups and implementation teams, which are organized as needed to address different aspects of the wet weather issue, develop plans, provide support for municipalities and advise the 3RWW staff and Board.

Historically, 3RWW received federal and state funding to support municipalities through a matching grant program for demonstrations projects that employed new technologies or used a multi-municipal approach. Since the municipal consent orders were signed in 2004, 3RWW began using its funding resources to coordinate regional compliance activities, such as system-wide GIS mapping and a regional flow monitoring plan, that benefit all ALCOSAN service communities under the consent orders. 3RWW has created tools such as the calibrated radar rainfall system to assist municipalities in evaluating their systems during wet weather and a municipal data support (MDS) system, which is a centralized online tool for municipalities to share collection system data, create reports for the regulatory agencies and ultimately to use the standardized data to develop a viable long-term plan.

In the area of public outreach, 3 Rivers focuses on educating myriad audiences about the impact of wet weather issues on public health and the region's economy through an annual sewer conference that educates more than 350 area engineers, municipal representatives and decision-makers; a public outreach campaign geared toward homeowners; education sessions with legislators; and school-related watershed education programs. 3RWW has worked to support municipal outreach efforts through such projects as the development and placement of newspaper ads that meet the public education requirement outlined in the Municipal Separate Storm Sewer System permit, a storm drain marker program, a homeowner's guide to protecting our watershed and a comprehensive, educational website accessed at www.3riverswetweather.org.

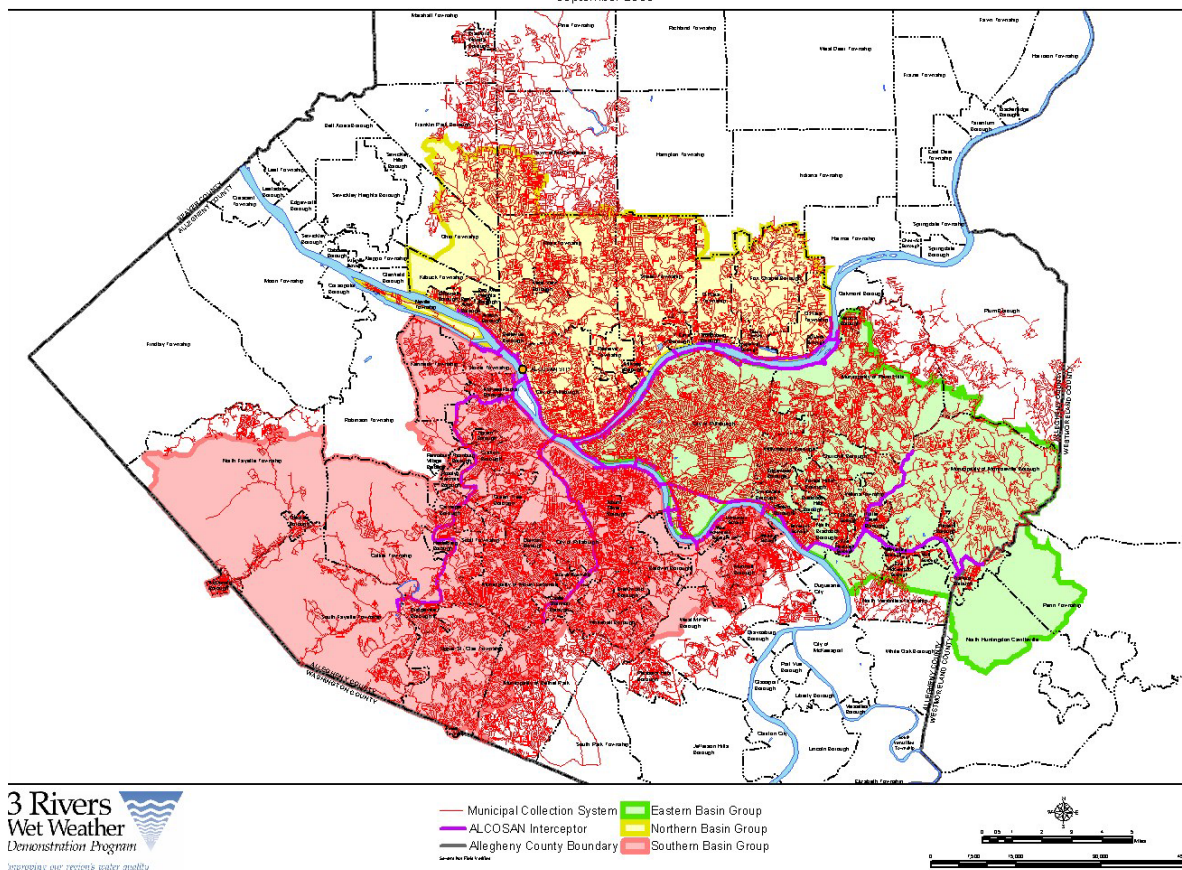
As federal and state funding have shifted to ALCOSAN for its work under a 2008 federal consent decree, 3RWW has received some limited private foundation funding to support its municipal mission, and continues to seek alternate sources of funding to help communities move toward sewer system consolidation for the most cost-effective operation and management of the system for generations to come.

3 Rivers Wet Weather Basin Groups of Municipal Elected Officials Statement of Purpose

We the undersigned, as representatives of the communities of the Eastern/ Northern/ Southern Basin, hereby form the Eastern/Northern/Southern Basin Group. Our purpose is to overcome the challenges facing our communities related to sewage overflows. Recognizing we share one sewer system within the Eastern/Northern/Southern Basin, we dedicate our efforts toward cultivating inter-municipal partnerships and cost-effective strategies to operate, maintain and rehabilitate the sewage infrastructure servicing our communities.

Background on the Basin Groups

- In January 2001, 3 Rivers Wet Weather established three Basin Groups (based on sewer sheds in the ALCOSAN service area). These groups are known as the Eastern Communities Basin Group (encompassing 26 communities east of Pittsburgh’s three rivers) Northern Communities Basin Group (covering 22 communities north of the rivers) and the Southern Communities Basin Group (with 35 communities south of the rivers). (See map below.)



The communities in each of these basins were grouped together because in many cases, they share the same watersheds and/or sewer sheds, and their sewer collection systems flow into the same segment of the ALCOSAN interceptor system.

- A total of nearly 200 municipal officials from each of the 83 communities serve on the Eastern, Northern and Southern Communities Basin Groups. Members also include municipal sewage authorities, Councils of Government and environmental organizations. During the first year, the groups made unprecedented progress in their collaborative efforts. The members learned about new regulations, shared resources and developed strategies for cost-effective basin-wide solutions to sewer system rehabilitation. The Basin Groups also began exploring regionalization options for managing and operating the municipal collection system in the future.

- **Basin Group Goals:**

- Develop strategies for cost-effective basin-wide solutions to sewer system rehabilitation
- Educate municipal officials
- Share information and resources
- Overcome barriers to regional cooperation
- Build consensus
- Convey a unified voice to regulatory agencies

- In January 2002, 3RWWDP published and distributed a Regionalization Report as an initial study on options for regionalizing the management of sewage collection within the ALCOSAN service area. The Regionalization Report was developed as a discussion tool for basin group members and other local decision makers to explore options for long-term, sustainable regional management of the sewage collection system in Allegheny County.

Timeline of Basin Group Progress

- **January 2001:** 3RWW Created the Basin Groups of Municipal Elected Officials

- **Summer 2001:** 3RWW Communicated with the EPA and invited them to attend the October Basin Group Meeting

- **October 2001:** Representatives from the EPA presented their non-traditional enforcement approach to the Basin Groups. The EPA chose to address these groups of educated officials as a more efficient and effective method of communication than approaching each of 83 municipalities.

- **Late February 2002:** Communities received a draft Administrative Consent Order (ACO) with a non-traditional approach:

- No initial penalties for past violations
- Tap-in restrictions self-regulated with compliance
- Local regulatory agencies (ACHD & DEP) to oversee compliance with the sanitary sewer communities (SSO) and combined sewer communities (CSO).

- **March 2002:** Basin Groups provided extensive feedback on the issues and concerns regarding the ACOs to 3RWW to be compiled and conveyed to the regulatory agencies as “one unified voice” from the region.
- **April 12, 2002:** The Core Basin Group, comprising the chairs of each of the basin groups and a few other key basin group leaders, met with representatives from the regulatory agencies (EPA, Department of Justice, DEP & ACHD) to cover the “Top Ten” broad issues/concerns of the communities.
- **April 17-18, 2002:** The agencies met with 100+ municipal engineers, solicitors and managers in four separate sessions in an open Q & A forum to discuss communities’ issues and concerns. The agencies also provided an overview of the issues presented to them on April 12 and they responded to each of those issues from the agencies’ perspective. As a result of these meetings, the agencies asked the municipalities to provide “alternative language” for sections of the ACO. The EPA encouraged the Basin Groups to approach compliance through inter-municipal cooperation, and the EPA committed to working closely with the Basin Groups to help ensure the effort is successful.
- **April 30-July 2002:** 3RWW organized municipal solicitors and engineers working groups to facilitate the development of alternative language and technical protocols for the consent orders. Fifty meetings were held in two months.
- **August 2, 2002:** 3RWW, on behalf of the municipalities, submitted draft “Consensus Orders” to regulatory agencies. These consensus orders represented the unified voice of the municipalities on key issues in the order such as penalties, activity schedule and approach, credit for past work, standard an protocols and prior enforcement action.
- **November 2002:** A core group of engineers and managers presented key elements of the Consensus Orders to local regulatory agencies.
- **April 2003:** 3RWW communicated with agencies to encourage negotiation process with municipalities to continue momentum that was started with the consensus process.
- **May-November 2003:** 3RWW facilitated negotiation meetings between regulatory agencies and municipalities (solicitors and engineers)
- **October 2003:** 3RWW organized Managers and Engineers Basin Groups to begin work in preparation for the final municipal consent orders and the regional compliance activities that would follow.
- **November 2003:** Municipalities received a final consent order with a signing deadline of January 31, 2004

• **January 2004:** ALCOSAN communities signed a consistent municipal consent order that meets the objectives of the regulatory agencies, benefits the municipalities and is supported by solicitors and engineers, who have invested countless hours in the development of the final order. The final order spans 2004-2015 (*See the separate document entitled Consent Order timeline*) and requires municipalities to:

- Televising their sewer systems
- Mapping their sewer systems
- Making critical repairs
- Monitoring flows
- Implementing Operation & Maintenance programs
- Participating with ALCOSAN in a regional long-term wet weather control plan

• **February 2004:** 3RWW hosted a “Moving Forward” event for city, county and municipal officials, regulators and state legislators to celebrate the success of an unprecedented consensus-based consent order process that included more than 150 meetings and 18 months of planning and negotiations.

• **2004-2006:** 3 Rivers Wet Weather GPS Manhole Mapping Project

- Total project cost: \$2 million.
- Funding: \$2 million from PA Safe Water Fund.
- Total cost-savings to ratepayer through regional approach: \$9 million.
- Regional approach to mapping manholes throughout 4,000 miles of sewers in ALCOSAN service area, rather than 83 municipalities attempting to complete individually.
- Used Global Positioning Satellite (GPS) technology to locate and verify more than 80,000 manholes.
- Data used by municipalities for compliance with municipal consent orders
- Consistent, standardized, high-quality data is a critical component of a long-term wet weather control plan to be developed in a few years.
- A PDA field tool was provided to communities for inputting additional physical survey data into the electronic mapping of the system
- 3RWW created an online compliance tool—the Municipal Data Support Site to help municipalities collect, organize, process, and/or report on data as required by the administrative consent orders.
- 95% of the ALCOSAN communities use the Municipal Data Support Site for reports on manhole inspections, mapping updates, etc.

• **2004-2009:** 3 Rivers Wet Weather Regional Flow Monitoring Plan

- Total project cost: \$10-15 million.
- Funding: \$2 million through PA DEP.
- Total cost-savings to ratepayer through regional approach: up to \$10-12 million.
- 3RWW created a Flow Monitoring Work Group in August 2004 to begin development, refinement and review of a regional flow monitoring plan.

- The Flow Monitoring Work Group comprised 30 municipal engineers representing 76% of the ALCOSAN communities and met monthly.
 - Workshops with individual communities helped to define the plan's details.
 - Original estimates of 900 flow meters (if municipalities completed flow monitoring individually) were reduced to 514 meters based on a regional approach.
 - The plan is so refined that many of the meters will be in the ground less than year.
 - Consistent, reliable data was collected for the development of a more cost-effective, efficient long-term control plan.
 - 95% of ALCOSAN communities requested to participate in the regional flow monitoring plan
 - A draft plan was submitted to the regulatory agencies on June 1, 2006 and finalized by October 2007.
 - Flow monitoring implementation, coordinated by ALCOSAN, spanned February 2008-February 2009
- **February 2009:** 3RWW developed the Feasibility Study Work Group to help municipalities comply with the next phase of their consent order.
- **Ongoing:** 3 Rivers Wet Weather will continue its role of representing the municipalities and expressing their unified voice to the regulatory agencies and ALCOSAN. Recent 3RWW stakeholder surveys and interviews showed that one of the organization's top priorities over the next five years (2009-2014) should be to focus on regional solutions to the sewage overflow problem, including consolidation of the sewage collection systems throughout the ALCOSAN service area. 3 Rivers Wet Weather is committed to providing the municipal support necessary to meet that goal.

Eastern Communities Basin Group

Communities, Authorities, Environmental Groups & COGs

- Braddock
- Braddock Hills
- Chalfant
- Churchill
- City of Pittsburgh
- East McKeesport
- East Pittsburgh
- Edgewood
- Forest Hills
- Monroeville
- North Braddock
- North Huntingdon
- *North Huntingdon Municipal Authority*
- North Versailles
- *North Versailles Municipal Authority*
- Penn Hills
- Penn Township
- Plum
- *Plum Municipal Authority*
- Pitcairn
- Rankin
- *Steel Valley COG*
- Swissvale
- Trafford
- Turtle Creek
- *Turtle Creek Watershed Association*
- *Turtle Creek COG*
- Verona
- Wall Borough
- Wilkins Township
- Wilkinsburg
- *Wilkinsburg-Penn Joint Water Authority*
- Wilmerding

Northern Communities Basin Group

Communities, Environmental Groups, Authorities & COGs

- *Allegheny Valley COG*
- Aspinwall Borough
- Avalon
- Bellevue
- Ben Avon
- Ben Avon Heights
- Blawnox Borough
- City of Pittsburgh
- Emsworth Borough
- Etna Borough
- Fox Chapel Borough
- Franklin Park
- *Girty's Run Joint Sewer Authority*
- Indiana Township
- Kilbuck Township
- McCandless
- *McCandless Township Sanitary Authority*
- Millvale Borough
- Neville Township
- *North Hills COG*
- O'Hara Township
- Ohio Township
- *Ohio Township Sanitary Authority*
- *Quaker Valley COG*
- Reserve Township
- Ross Township
- Shaler Township
- Sharpsburg Borough
- West View Borough
- *West View Water Authority*

Southern Communities Basin Group

Communities, Authorities, Environmental Groups & COGs

- Baldwin
- Baldwin Township
- Bethel Park
- *Bethel Park Municipal Authority*
- Brentwood
- Bridgeville
- Carnegie
- Castle Shannon
- *Char-West COG*
- *Chartiers Flood Control Authority*
- City of Pittsburgh
- Collier Township
- *Collier Township Authority*
- Crafton
- Dormont
- Green Tree
- Heidelberg
- Homestead
- Ingram
- Kennedy
- McDonald
- *McDonald Sewage Authority*
- McKees Rocks
- Mt. Lebanon
- Mt. Oliver
- Munhall
- North Fayette
- Oakdale
- Peters Township
- Pleasant Hills
- Robinson Township
- *Robinson Township Municipal Authority (MATR)*
- Rosslyn Farms
- *Scott Conservancy*
- Scott Township
- *South Fayette Municipal Authority*
- South Fayette
- *South Hills Area COG*
- Stowe Township
- Thornburg
- *Twin Rivers COG*
- Upper St. Clair
- West Homestead
- West Mifflin
- *West Mifflin Sanitary Sewer Municipal Authority*
- Whitaker Borough
- Whitehall Borough

Sewer-Related Acronyms and Terms

3RWW – 3 Rivers Wet Weather
ACHD – Allegheny County Health Department
ACO – Administrative Consent Order
ACOE – Army Corps of Engineers
ALCOSAN – Allegheny County Sanitary Authority
CAP – Corrective Action Plan
CCTV – Closed circuit television
CFR – Code of Federal Regulation
CIPP – Cured-in-place pipe
CMOM – Capacity, Management, Operation and Maintenance
COA – Consent Order and Agreement
CSO – Combined Sewer Overflow
CWA – Clean Water Act
DEP – Department of Environmental Protection
EPA – Environmental Protection Agency
GIS – Geographic Information System
GPS – Global positioning system
I/I – Inflow and infiltration
LRB – Legislative Reference Bureau
LTCP – Long-term Wet Weather Control Plan
MS4 – Municipal Separate Storm Sewer System
NMC – Nine Minimum Controls (part of the CSO Policy)
NPDES – National Pollutant Discharge Elimination System (permitting program)
POTW – Publicly Owned Treatment Works
SBA – Small Business Administration
SBE – Small Business Enterprise
SBRA – Small Business in a Rural Area
SSO – Sanitary Sewer Overflow
TEA-21 – Transportation Equity Act of the 21st Century
WBE – Women’s Business Enterprise
WRDA – Water Resources Development Act

WET WEATHER TERMS: _____

Inflow – When water enters into the sewer system through an opening such as a manhole lid or roof drain.

Infiltration – When water enters the sewer system through leakage such as a cracked pipe. This can be caused by rainfall or by a high ground water table in the soil.

Combined Sewer System – A system that is designed to carry both stormwater and sewage in the same pipe. Combined sewer system communities are regulated by the CSO Policy (Nine minimum controls).

Sanitary Sewer System – A system that is designed to carry only sewage. Sanitary sewer system communities will be obligated to meet standards outlined in the new SSO Rule (CMOM) in the very near future.

Municipal Separate Storm Sewer Systems (MS⁴) – A system designed to carry stormwater only. MS⁴ systems will be regulated by the Storm Water Phase II regulations.

CSOs (Combined Sewer Overflows) – When a combined sewer is too full of rainwater and sewage, untreated sewage is discharged through design structures. This is designed to occur during wet weather, but can also occur due to poor operation and maintenance. Overflows also can occur through overflowing manholes or basement backups.

SSOs (Sanitary Sewer Overflows) – When a sanitary or separate sewer is too full due to inflow and infiltration, untreated sewage is discharged through overflowing manholes and basement backups. This occurs primarily during wet weather, but can also occur due to poor operation and maintenance.

HOMEOWNER TERMS: _____

Driveway drain – This drain channels water away from the driveway. On a driveway sloped toward the house, the drain is frequently improperly connected to the sanitary sewer.

Foundation drain (also known as a French drain) – A drain installed around a home’s foundation to prevent ground water from entering the basement. Water should be routed to the storm water system and not the sanitary sewer system.

Sump pump- A system typically installed in a homeowner’s basement that collects water and pumps it into the storm water system to avoid wet basements. Sump pumps are frequently illegally connected to the sanitary sewer system.

Dye Test - A tracer test that is done to determine if downspouts or drains are connected to the sanitary sewer.

House lateral - The pipe that conveys sewage from the house to the public sewer system connection.

Wye - The term for the point of connection between the house lateral and the public sewer.

MUNICIPAL SYSTEM TERMS: _____

Municipal Satellite Collection System – The portion of the sewer that is owned by the municipality. Excludes the house lateral. Carries sewage from many individual homes to the trunk sewer.

Trunk Sewer - Carries sewage from multiple municipal collection systems to the inceptor.

Interceptor Sewer – Carries sewage from the trunk sewers to the treatment plant.

Manholes – Structures that are placed at changes in direction and elevations of sewer systems. Manholes are used as access for cleaning the sewer system and other maintenance activities.

Pump Station – When a sewage connection cannot be made by gravity, this facility collects the sewage and pumps it to an adjacent sewer shed.

ALCOSAN SYSTEM TERMS: _____

POTW – Publicly Owned Treatment Plant, i.e. ALCOSAN.

Parallel Interceptor or Relief Sewer – A parallel sewer constructed to carry extra sewage volumes, which exceed the capacity of any segment of the system.

Regulator/Overflow Structures – Structures that are designed to regulate sewage flows to the treatment plant by discharging excess flows into the rivers.

Deep Tunnel System – A system of large diameter tunnels buried up to 120 feet deep under the rivers that are the main conveyance of sewage to ALCOSAN.

Retention or Storage Facility – A tank that is built to store excess wet weather flows from sewer systems to prevent overflows. The tanks are drained back to the treatment plant during dry weather.

Direct Stream Connections – Creeks and streams in municipalities that are captured into the sewage system and conveyed to ALCOSAN rather than channeled to the river.

Satellite Treatment Facility – A small wet weather sewage treatment facility located at a point of a combined sewer overflow to treat the sewage before discharging it to streams and rivers.

Long-Term Wet Weather Control Plan (LTCP) - A detailed plan required under NPDES permits for combined sewer systems. The plan, which includes costly infrastructure projects, must reduce overflows to only 3 or 4 wet weather events annually, and must not impact water quality.

MAJOR REGULATION TERMS: _____

Clean Water Act – A 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to waters of the United States. The Act, enforced by the Environmental Protection Agency, prohibits any sanitary sewer overflows and requires that combined sewer overflows be controlled to 4 or 5 annually.

Clean Streams Law – State regulation similar to the Clean Water Act. Enforced by the Pennsylvania Department of Environmental Protection, this law is one of the first such environmental laws in the country to bring industrial wastes under legal control.

NPDES – National Pollutant Discharge Elimination System – A national permit system for all discharges to waterways.

CMOM (Capacity, Management, Operation & Maintenance) - Also known as the SSO Rule, this proposed regulation sets stringent guidelines for the capacity, management, operation and maintenance of municipal sanitary sewer collection systems.

CSO Policy - Sets short (nine minimum controls) and long-term (long-term control plan) requirements for municipal combined sewer collection systems.

ACO/COA - Administrative Consent Order/Consent Order and Agreement. In January 2004, municipalities in the ALCOSAN service area signed legally binding consent orders that require repair, assessment and long-term planning activities of each municipality's sewage collection system. Sanitary sewer communities received the administrative consent orders which are monitored by the Allegheny County Health Department and combined sewer communities received the Consent Order and Agreement overseen by the PA Department of Environmental Protection.

Feasibility Studies – Outlined in the municipal consent orders. Requires communities to analyze alternatives to manage sewage and stormwater, from both a technical and economic perspective.