



2012 Annual Report



A Message from the Executive Director



We hope you enjoy the Southeast Metro Stormwater Authority's 2012 recap of stormwater management activities presented in this Annual Report. SEMSWA's 2012 on-the-ground capital projects efforts could be termed the "Year of the Ponds".

Construction of regional detention and water quality ponds provide critical infrastructure to manage stormwater and facilitate timely development. The City of Centennial and Arapahoe County require that water quality capture volume (WQCV) and flood control detention be provided for all new development, redevelopment, or expansion of a site by a developer. Regional detention, as recognized by the City and County, refers to online facilities located on a major stream designed to accommodate the fully developed flows from the upstream watershed.

Because of their size, their regional interaction with other watershed facilities, and their significance in floodplain management, regional facilities are not allowed to be privately owned. SEMSWA has made a concerted effort to complete these critical facilities because regional detention and water quality infrastructure are typically more reliable, require less land area devoted to stormwater management, and are more cost-effective to construct and maintain than private developer-owned, single lot detention facilities.

While SEMSWA uses capital funds to construct these regional facilities, there are a couple of ways we recover these costs from developers. An Excess Capacity Fee (ECF) is used to provide SEMSWA a means of recouping its investment in the on-going construction of regional detention/water quality facilities to support future development. By incorporating an ECF, developments that benefit from the recently constructed regional facilities will be assessed a fee for their impervious areas. In addition, a System Development Fee (SDF) is assessed to a developer to cover up front the construction costs of *planned* regional improvements. The benefit to the developer is the ability to use the regional facilities, eliminating or significantly reducing costly on-site facilities. This makes regional ponds a win for the watershed, for a developer, and for our ratepayers.

We invite you to read this Annual 2012 Report that highlights our efforts to manage stormwater efficiently and effectively.

John A. McCarty, PE, PULF

The SEMSWA Mission

Provide stormwater management services essential to the protection, preservation, and enhancement of our neighborhoods, community, and natural resources through flood control, water quality, construction, maintenance, and education.

2012 Highlights

- The Land Development Group instituted an award-winning electronic review process for development cases using proprietary software to streamline the time-sensitive case review and approval efforts.
- The CIP and Maintenance groups turned a pilot program for storm pipe repair/replace operations for critical infrastructure into an annual program with committed funds.
- The Water Quality group won an award for its collaborative efforts in implementing an interactive touch-screen kiosk as an educational tool along the Cherry Creek Trail.
- The Land Development Group won an award for spearheading a storm pipe Comprehensive Condition Assessment Report that allows SEMSWA to prioritize needed repairs and replacements.
- The Floodplain Group developed a flood safety education plan called "Stay Safe," with checklists for flood readiness.
- The Water Quality Group instituted a new policy for construction site controls that streamlined permitting requirements and designated some minor construction activities as low risk and not permitted.



Capital Improvement Program



This grouted boulder rundown into Regional Pond D-2 with concrete baffle energy-dissipater blocks provides stability during high flow events in Dove Creek

2012 was a very active year for capital construction of regional ponds in the developing basins of Dove, Windmill and Lone Tree creeks. These master planned facilities address flood control and water quality on a watershed basis and meet SEMSWA's goal of effective and efficient stormwater management while providing greater opportunity for more favorable riparian habitat associated with a larger greenway open space. Regional ponds optimize available land for use by the development community and provide the local community with flood control and water quality planned in accordance with good drainage practices. All regional ponds in the Dove, Windmill and Lone Tree creek basins are now complete.



Piney Creek Efforts in 2012

Currently, development and the stream environment are out of balance on Piney Creek. Upstream reaches are eroding as a result of increased flows due to development.

This erosion provides sediment that is depositing. Trails have been covered by sediment and water, and residents in low-lying homes have noticed an increase in their sump pump usage. SEMSWA and the Urban Drainage and Flood Control District focused on the privately owned Piney Creek Ranches area in 2012, conducting public outreach and initiating a conceptual design for this 2.1-mile stream segment.

CIP Projects Completed in 2012

- ✓ Lone Tree Creek Regional Pond L-2
- ✓ Big Dry Creek, Forest Park Tributary Channel Stabilization
- ✓ Dove Creek Regional Pond D-2
- ✓ Lincoln Executive Center East Regional Pond
- ✓ Arapahoe Road and Fairfax Avenue Storm Sewer Rehabilitation
- ✓ Tallgrass Development Sediment Pond Removal and Channel Restoration
- ✓ Windmill Creek at Centennial Airport Regional Pond W-1



Lone Tree Creek Regional Pond L-2 located north of the Centennial Airport provides regional flood detention and water quality treatment for a developing area

Land Development Coordination and Awards

Land Development staff continued coordinating development opportunities within Arapahoe County and the City of Centennial to meet the objective of comprehensive, efficient and effective stormwater management. SEMSWA responded to customer service comments during 2012 by improving several internal processes. Areas of improvements included increasing the frequency and amount of meetings with applicants prior to plan submittal to allow full comprehension of the required site plan and drainage report components; implementing an electronic submittal process that saves time, effort, and resources for the developer and SEMSWA; and streamlining permitting requirements. SEMSWA is committed to a regular assessment of our review, approval, and permitting processes to streamline where possible, making it easier to do business in SEMSWA's service area.



Regional detention and water quality facility in Centennial Airport area

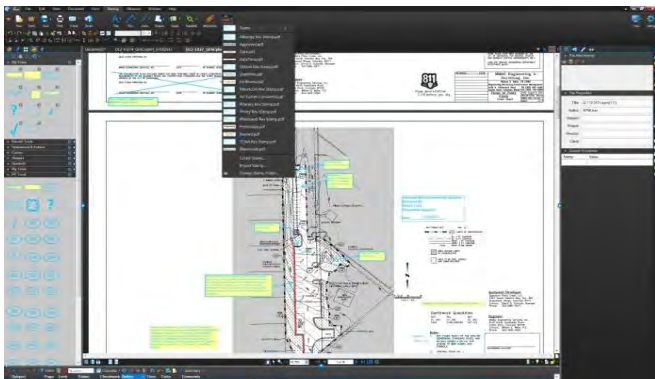
A developing area of interest to SEMSWA is the Centennial Airport area in the Dove Creek, Windmill Creek, and Lone Tree Creek basins. SEMSWA has invested in the construction of regional detention and water quality ponds for an efficient and effective approach to stormwater management in these basins. This area has a high economic development potential for both the City and County. SEMSWA remains an eager partner to facilitate a cost-effective balance between the requirements of storm flow conveyance, storage and water quality treatment for development, and the timely construction of stormwater facilities.



Example of critical pipe identified in Asset Condition Report

At its 27th Annual Awards ceremony, the Colorado Chapter of the American Public Works Association (APWA) honored SEMSWA with awards in three public works categories. APWA is an international education and professional association that provides high-quality public works goods and services. In 2012, 26 public entities submitted 50 public works projects that demonstrated innovation and creativity. SEMSWA won awards in the following categories:

- Public Works Administration, for an **Asset Condition Assessment Program** to prioritize storm sewer pipe maintenance projects and allow the SEMSWA Board of Directors to estimate future budget needs and proactively create a funding source dedicated to the repair and replacement of critical pipe
- Building Code Admin/Permitting/Enforcement, for implementing a streamlined and efficient **Electronic Plan Review and Approval System** that integrates seamlessly with the City of Centennial land development process, optimizes review comments and resubmittals, and eliminates the need for multiple paper copies
- Public Relations/Public Awareness/Community Involvement, for the development of **water quality educational content for an interactive touch-screen kiosk** at the Parker Jordan Centennial Open Space to educate visitors on the story of Cherry Creek and its riparian floodplain benefits



A screen shot of the Bluebeam® Revu multi-faceted software that provides greater efficiency in reviewing, with a 'markup' customized symbol library for editing documents, eliminating the cost for multiple paper copies

Floodplain Management and Master Planning Programs

Arapahoe County and the City of Centennial currently have many miles of perennial and seasonal drainageways, most of which have defined 100-year floodplains. The Floodplain Management program uses corrective and preventive measures to reduce flood damage to public and private properties through a variety of components, including No Adverse Impact education, floodplain regulations, flood control improvements and floodplain studies. Additionally, SEMSWA, in cooperation with UDFCD and other local jurisdictions, develops and updates drainageway master plans that mitigate flood hazards for existing and future development by ensuring that development is properly planned, and appropriately sized facilities are constructed. An important component of floodplain management is education, and in 2012, SEMSWA instituted the *Stay Safe Plan* to provide information that the public can use to protect their property and loved ones from floods. The *Stay Safe Plan* acknowledges that SEMSWA and the public are partners in staying safe during high flow events.



Floodplain Program Statistics

During 2012, 43 floodplain permits were reviewed, approved, and issued for work in a floodplain; seven floodplain studies were assessed for impacts from proposed work; and 12 requests for a floodplain modification were reviewed. Because determining floodplain limits is more than the average property owner is equipped to handle, SEMSWA responded to 65 public inquiries requesting assistance in defining floodplain limits and property consequences. Also during 2012, five floodplain violations were investigated. Outreach efforts were significant during 2012 and included four public meetings and 65,400 mailings to residents in SEMSWA's service area with important flood risk information.

Master Plans Completed

During 2012, the following master plans and studies were completed in Centennial and Arapahoe County:

- Little Creek Flood Hazard Area Delineation (FHAD) and Master Development Plan (MDP)
- Piney Creek and Antelope Creek FHAD and MDP

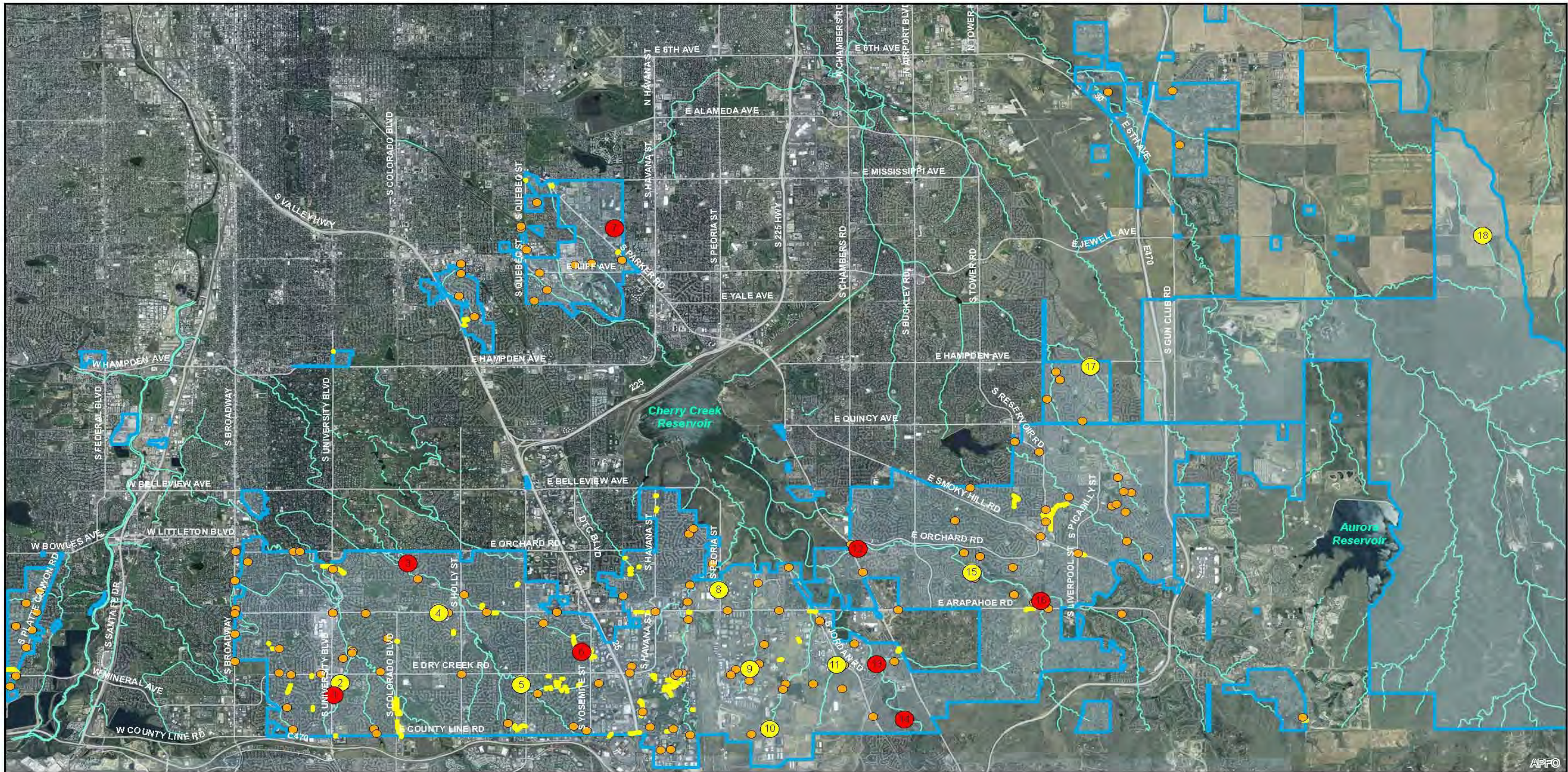
Efforts in progress during 2012 for basin master planning included finalizing the West Toll Gate and No Name Creek plan, and initiating Box Elder Creek, Iliff Corridor Study, and Happy Canyon Creek plans.



Happy Canyon Creek erosion, conveyance, water quality, and floodplain issues studied in 2012-2013



Cherry Creek utilizing its broad floodplain riparian area for attenuation and infiltration of receding storm flows on June 7, 2012. Peak flow during the June 5-6 storm event at Parker Jordan Centennial Open Space in Centennial was estimated at 1700 cubic feet per second (cfs), compared with the more typical 100 cfs base flow



SEMSWA CIP and Maintenance Project Map 2012



Legend

- CIP Completed During 2012
- CIP In Progress During 2012
- Maintenance Projects
- Pipes Inspected by Video
- SEMSWA Service Area

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|---|--|--|
| 1. Country Park Regional Pond Conversion (Detention to EDB) | 7. Mexico Pond Retrofit | 13. Cherry Creek Stream Reclamation @ Eco Park |
| 2. Big Dry Creek Trib B (Forest Park) Stabilization | 8. Lincoln Exec. Center East Regional Pond | 14. Cherry Creek Drop Structure at 17 Mile Ped Bridge |
| 3. Little Dry Creek Reach 6 Channel Improvements | 9. Lone Tree Creek L-2 Regional Pond Construction | 15. Piney Creek @ Tower Rd Channel Reclamation (Phase I) |
| 4. Arapahoe Rd @ Fairfax Storm Sewer Rehab (CIPP) | 10. Windmill Creek W-1 Regional Pond Construction | 16. Piney Creek @ Caley Channel Reclamation (Phase II) |
| 5. Willow Creek Stabilization (Quebec to Dry Creek) | 11. Dove Creek D-2 Regional Pond Construction | 17. Tallgrass Sediment Pond Removal |
| 6. Little Dry Creek @ Walnut Hills Outfall Improvements | 12. Piney Creek @ Parker Rd Channel and Regional Pond Improvements | 18. First Creek Culvert Replacement (Jewell Ave) |

Water Quality Program

The Federal Clean Water Act requires that SEMSWA, as the operator of a storm sewer system in the Cherry Creek Basin, obtain a State Stormwater Discharge Permit with stringent requirements to reduce pollutant discharges, and actively protect water quality through education, standards, oversight, and enforcement. To ensure that SEMSWA's permit is effective for water quality over 1,100 inspections at over 140 active construction sites were conducted; 33 potentially improper or illegal discharges were investigated and resolved, with six enforcement actions; 18 public education and outreach events were planned, promoted and participated in; and over 57,000 pounds of household hazardous waste were collected from almost 600 households. Additionally, as part of an effective construction site control program, 19 non-compliance re-inspections fees were collected to enforce the standards.

Regional Approach to Quality

As a tributary stream to Cherry Creek and the Reservoir, water quality within Cottonwood Creek is of utmost importance and is the primary reason that there is a regional approach to stormwater management in the Cottonwood Creek basin. This regional approach includes regional detention and treatment of an additional volume of storm flows, stream stabilization, source control, and retrofit of existing detention ponds to include water quality. The benefits of a regional system are demonstrated for each SEMSWA program area, from the maintenance efficiencies, to the mutual goals realized for cost-effective facilities for the developer and SEMSWA, and to the high level of water quality treatment achieved in the basin.

Streamlined Permitting

In 2012, SEMSWA established a new policy to permit land disturbances that balances environmentally sound construction practices with efficient use of resources for SEMSWA, the development community and contractors. This new policy allows an abbreviated and streamlined process for activities that are not expected to contribute sediment to our stormwater system and will not adversely impact water quality. A series of fact sheets and guidance documents are available to assist a homeowner or contractor in minimizing their impact during construction.



Drop structure in Cottonwood Creek, a component of the regional stream stabilization efforts to minimize transport of sediment to Cherry Creek and the Reservoir

Maintenance Program

During 2012, maintenance efforts continued to consist of routine sediment removal from channels and ponds; inlet, vault, and culvert cleaning; and pipe inspection, both visual and with a camera. Additionally, the crews were active on transportation drainage infrastructure in 2012, repairing roadside drainage swales to increase conveyance of storm flows and keep overflows out of traffic lanes, raising manholes to mitigate safety concerns, and repairing, replacing, or slip-lining corrugated metal pipe (CMP) in the road right-of-way, depending on the severity of the pipe condition.

One of the special projects conducted by the Maintenance Program in 2012 was the conversion of the Mexico retention pond in the Four-Square-Mile area of unincorporated Arapahoe County to a sub-regional water quality pond. This entailed installing an outlet structure that releases storm flows to the stormwater system at a rate that invites the settling of sediments, leaving the released flows cleaner and improving water quality.

The June 6-7 storm event created additional maintenance activities, specifically the erosion of Picadilly Avenue at Coal Creek in the northern portion of the SEMSWA service area. The crews cleaned out the plugged and ineffective CMP culverts, added flared end sections, and reinforced the upstream side to get a greater flow volume through the culverts.



Retention pond at Mexico Ave. and Beeler St.



Completed WQ outlet structure at Mexico Pond



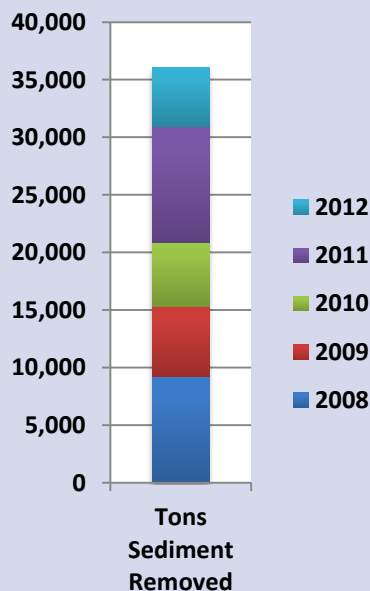
Plugged culverts at Picadilly Ave. and Coal Creek



Culvert and roadway repair work in progress

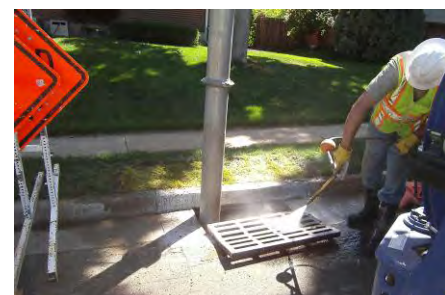


Completed culvert repair to increase conveyance

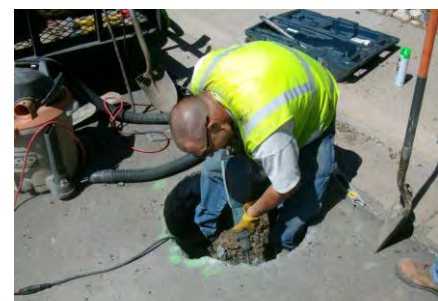


The Maintenance Program is responsible for inspecting, cleaning, repairing, and replacing stormwater infrastructure so that storm flows are effectively conveyed to the drainageway. The 2012 Work Order statistics illustrate the infrastructure cleaned and the tons of sediment and debris removed:

- **3,592** inlet grates and vaults cleaned
- **2,950** feet storm pipe cleaned
- **5,120** tons sediment removed
- **236** tons overgrowth removed
- **792** acres mowing/weed control
- **122** pond maintenance events
- **30,219** feet storm pipe inspected
- **382** service requests processed



Cleaning inlet grates along City/County roadways



Raising manholes in roadway right-of-way

Public Outreach



'Working in Waterways' re-vegetation training



Inlet labeling in the Walnut Hills neighborhood



The SEMSWA Vector Truck at Public Works Week

SEMSWA staff are involved with numerous and varied outreach activities that strengthen the connection between people and their watershed, whether it's a capital project being constructed in the creek adjacent to a property, a water quality education effort in an attempt to change impactful behaviors, or an appeal to be aware about the flooding potential of a creek and encourage floodplain insurance. The goal is to foster partnerships between SEMSWA and residents and businesses with the purpose of managing storm event runoff as a natural resource benefit rather than a nuisance or harmful event. 2012 outreach events reached over 100,000 citizens via a combination of public meetings, booths, mailings, newsletters, and HOA/volunteer events.



Teachers learning about water quality lessons for the classroom



Cherry Creek Outreach: A special interest watershed

Cherry Creek is an example of a watershed where public outreach is a regulatory requirement identified in the State Control Regulation. To encourage the community to share in the responsibility for watershed environmental health, it is important to educate on the story of Cherry Creek, the benefits of riparian floodplain areas, and the importance of water quality, while creating opportunities for environmental and open space interaction. In 2012, the award winning touch-screen kiosk was unveiled at Parker Jordan Centennial Open Space, enabling the visitor to use it as a guide as well as encourage activity and interest in the greenway.



A screen shot of an interactive activity at the educational Kiosk



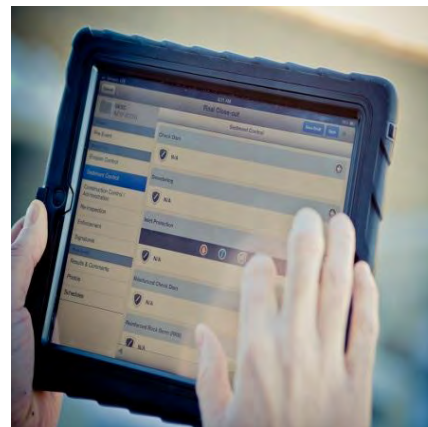
Cherry Creek is a natural place to educate on water quality

GIS/IT Solutions

During 2012, the GIS/IT Solutions group continued to lead the integration of GIS data into all SEMSWA program areas to enhance usage of the custom Cartegraph™ database. Projects included upgrades to mobile inspections, incorporation of infrastructure as-built information, and continuing enhancements to the storage, tracking, and retrieval of critical data.

To meet the need for a more efficient field inspection process, the GIS/IT Solutions group tested the use of iPad® tablets with the specialized Application *FieldID* for completing an inspection in the field, with signature, photographs, and direct emailing ability without any office time required. Integrating as-built data into the database tracking system allows the Maintenance and CIP programs an ability to use the best available data for project planning and assists the Floodplain and Master Planning programs in planning future stormwater system facilities for development.

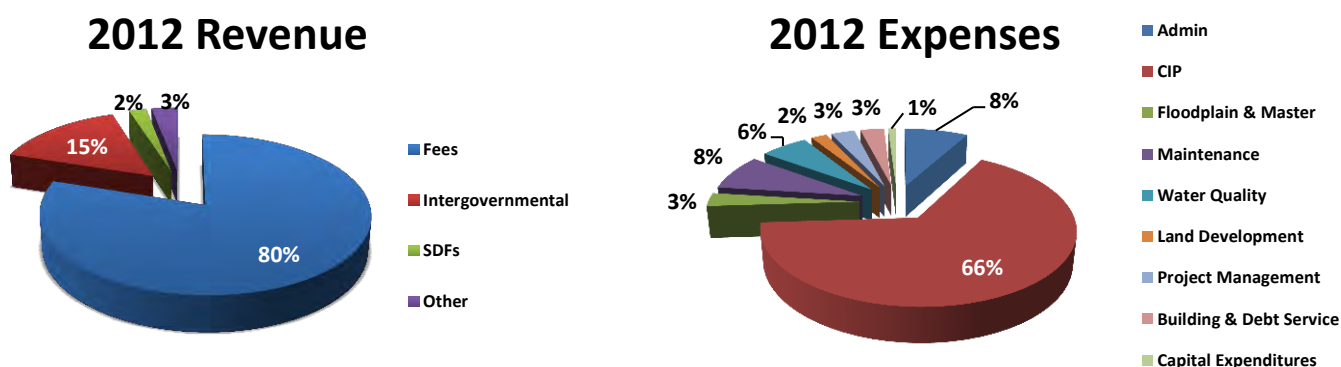
During 2102, GIS/IT continued to both refine impervious area calculations for billing purposes and polish the stormwater system Asset Condition Assessment reporting. GIS/IT also provided support to the MS4 Permit Annual Report process to achieve a completely paperless tracking system.



SEMSWA field personnel can complete an inspection report and provide it to the contractor for immediate follow-up using an iPad® mobile software application

SEMSWA Financials

SEMSWA is a political subdivision and a public corporation of the State, falling under the guidelines of the Colorado Revised Statutes (C.R.S.) for a "drainage authority" (29-1-204.2 C.R.S.). Fees are based on the amount each property contributes to stormwater runoff and the demand their property's runoff places on the drainage system. Fees paid by owners of existing properties are not used to pay for new development infrastructure, again ensuring an equitable assessment of fees for stormwater management services. Property owners can dispute their fee, specifically their calculated amount of impervious area and density through an appeals process. The SEMSWA Board has set fees to provide sufficient funds to properly manage stormwater and meet State and Federal regulatory requirements. Detailed information is available at www.semswa.org.



2012 SEMSWA STAFF





The Southeast Metro Stormwater Authority is a legal entity formed through an intergovernmental agreement between Arapahoe County, the City of Centennial, Arapahoe County Water and Wastewater Authority, East Cherry Creek Valley Water and Sanitation District, and the Inverness Water and Sanitation District. The boundaries of SEMSWA cover the City of Centennial and the developed areas of the unincorporated portions of the County. The Stormwater Authority, which is also an Enterprise, provides the resources and funding to protect people and property from flooding while also complying with water quality regulations.

SEMSWA thanks Mr. Josh Duncan, PE, Vintage Sparks Photography, for artistic photos of the stormwater facilities presented in this Annual Report.