

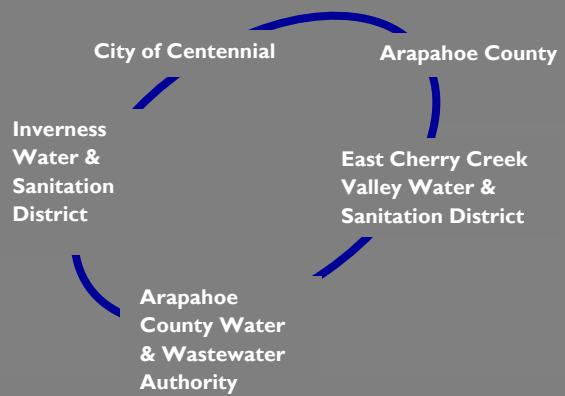


2008 Annual Report

Stormwater Management in the Southeast Metro Denver Area

The Southeast Metro Stormwater Authority (SEMSWA) is an independent governmental entity formed by an Intergovernmental Agreement among two local governments and three special districts to provide stormwater management for the south metro area. SEMSWA charges a stormwater management fee for individual and business property owners based on the amount of impervious surface (rooftops, driveways, and parking lots) on each property. The formation of SEMSWA has closed the funding gap to help protect people and property from flooding, and to protect water quality.

Funding from stormwater fees will help address critical needs in construction, remediation, and maintenance of stormwater infrastructure. New funding will also allow SEMSWA to meet Federal environmental mandates and improve water quality. All impervious surfaces have an effect on the drainage system and on downstream properties. Joining together to form SEMSWA has made stormwater management more efficient, standardized, and comprehensive in the southeast metro Denver area.



Board Member

Bart Miller
Rod Bockenfeld
Ron Weidmann

Andrea Suhaka
Jim Dyer
Linda Lehr

Frank Weddig

Jacque Wedding-Scott

Appointed by

City of Centennial
Arapahoe County
City of Centennial

City of Centennial
Arapahoe County
Special Districts

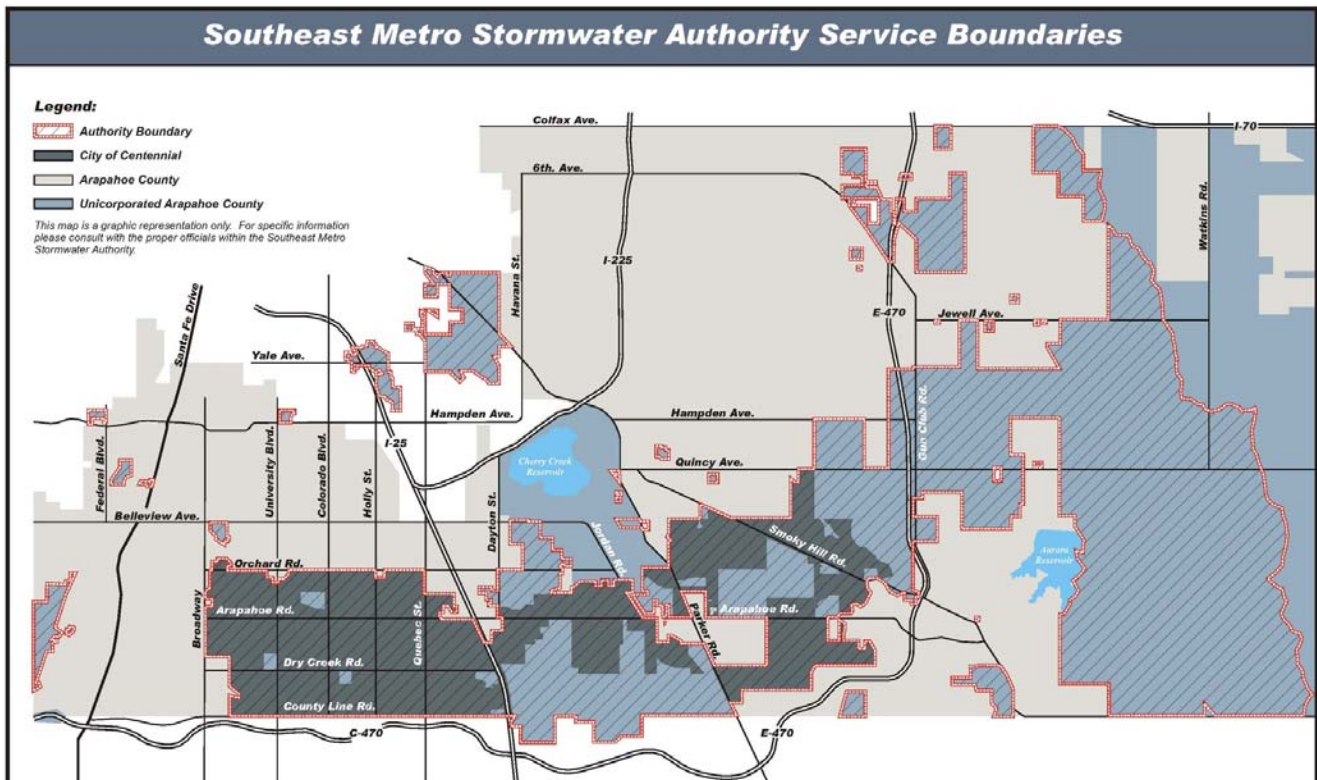
Arapahoe County

City of Centennial

Position

Chair
Chair Pro Tem
Secretary & Treasurer
Board Member
Board Member
Non-voting Board Member

Alternate Board Member
Alternate Board Member



Maintenance Program...

The SEMSWA Maintenance Program is responsible for maintaining culverts, pipes and other stormwater infrastructure to effectively convey stormwater to a major drainageway. Some of the day-to-day activities include:

- Conducting an inventory of existing infrastructure specifics, including size, type, and condition
- Responding to citizen concerns and inquiries about the storm sewer system
- Inspecting the storm sewer system
- Cleaning culverts, grates, inlets, pipes, and ponds
- Repairing outfalls, culverts, and rundowns
- Constructing minor infrastructure projects, including storm sewer pipe replacement, upsizing inlets, and modifying outfalls
- Constructing special remedial projects with in-house design, including collector system channel restoration and bank stabilization

During 2008, **330** tons of trash and debris, and **over 9,000** tons of sediment, were removed from stormwater infrastructure, including pipes, inlets, ponds, drainageway channels, and culverts during maintenance activities, and taken to the landfill.

During 2008, over **1,800** storm grates, **145** manholes, almost **500** vaults, and over **1,800** feet of storm sewer pipe were cleaned and flushed. In addition, **125,000** feet of storm sewer lines were inspected, **3,500** lineal feet of channel ditches were reconstructed, and over **350** linear feet of storm sewer pipe were replaced or rehabbed. Also during 2008, **27** detention ponds were maintained by SEMSWA maintenance crews.



Easter/Verbena Infrastructure Project

This year, several infrastructure projects were assisted by the Maintenance Program, including:

- Orchard Valley @ Cherry Creek: runoff conveyance swale for inlet overflow to detention pond
- East Tributary to Willow Creek, upstream of Rosemary Circle: Debris removal, riprap placement, and bank repair
- East Tributary to Willow Creek collector system: Conveyance swale restoration
- Filmore Tributary to Big Dry Creek: Outfall flared end section/pipe replacement and bank repair
- Easter/Verbena Intersection: Upsize inlet

What does SEMSWA do with wastes from culvert & pipe cleaning?



A designated waste disposal area for sludge removed during the cleaning of inlets, pipes, culverts, and other conveyance infrastructure is located at the Arapahoe County Road and Bridge, Peoria Street Yard near Centennial Airport. This area temporarily contains the wastes collected by the Vactor Truck during these stormwater infrastructure maintenance activities.



The Vactor Truck releases its content at this designated location in an engineered structure to assist in disposal. The multiple-bay, concrete-lined structure allows the Vactor Truck waste to dry out before disposal. The watery portion of the waste flows across a weir system while the solids settle out. This liquid then discharges into the sedimentation basin portion of the adjacent water quality pond, a permanent water quality best management practice at the Peoria Yard. Solid wastes are then dried and hauled off to the landfill to complete Vactor Truck waste disposal activities.



Maintenance Program projects...

Briarwood/Potomac
culvert cleanout project

Inverness detention pond
sediment removal project

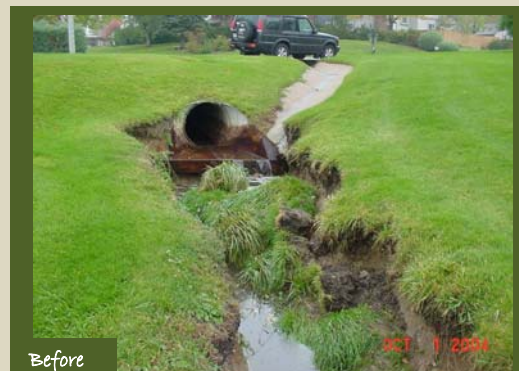
Willow Creek conveyance
system remedial project



Before



Before



Before



After



After



After

Land Development Coordination Program...

During 2008, the Land Development Program staff continued the coordination of land development opportunities within Arapahoe County and the City of Centennial to meet the objectives of comprehensive, efficient, and effective stormwater management. These objectives ensure that the community has well-planned, adequate, and long-term stormwater infrastructure.

Land development cases are referred to SEMSWA by the County and City. In addition, County and City capital construction projects are referred for review. SEMSWA Land Development staff meet weekly with City and County staff at pre-submittal meetings and Technical Review Committee meetings. During 2008, SEMSWA received **51** Arapahoe County referrals and **62** Centennial referrals.

Approvals associated with these referrals include:

- **26** City Phase III Drainage Report or Compliance Letter Approvals
- **26** City Construction Drawing recommendations for Approval
- **19** County Phase III Drainage Report or Compliance Letter Recommendation for Approval
- **19** County Construction Drawing recommendations for Approval

Also during 2008, SEMSWA Land Development staff reviewed **3** Centennial capital projects, **5** Arapahoe County capital projects, and a total of **18** SEMSWA capital projects and maintenance infrastructure special projects.

A primary component of the Land Development Program is the coordination of the water quality controls required for development and capital project construction activities, as well as the planning for adequate permanent water quality facilities for all construction efforts. In 2008, the following water quality features were approved:

- **26** Extended Detention Basins
- **16** Grass Swales and **2** Grass Buffers
- **4** Porous Landscape Detention Basins
- **1** Sand Filter Basin

Arapahoe to Easter, Havana to Lima 2002



Arapahoe to Easter, Havana to Lima 2008



Capital Improvement Program...

The Capital Improvement Program (CIP) consists of improvement projects to ensure safe and efficient control of runoff to minimize property damage. The CIP coordinates with the Maintenance Program to maximize resources among construction projects to make sure projects of all sizes and scopes are handled in a similar manner. Typical projects include:

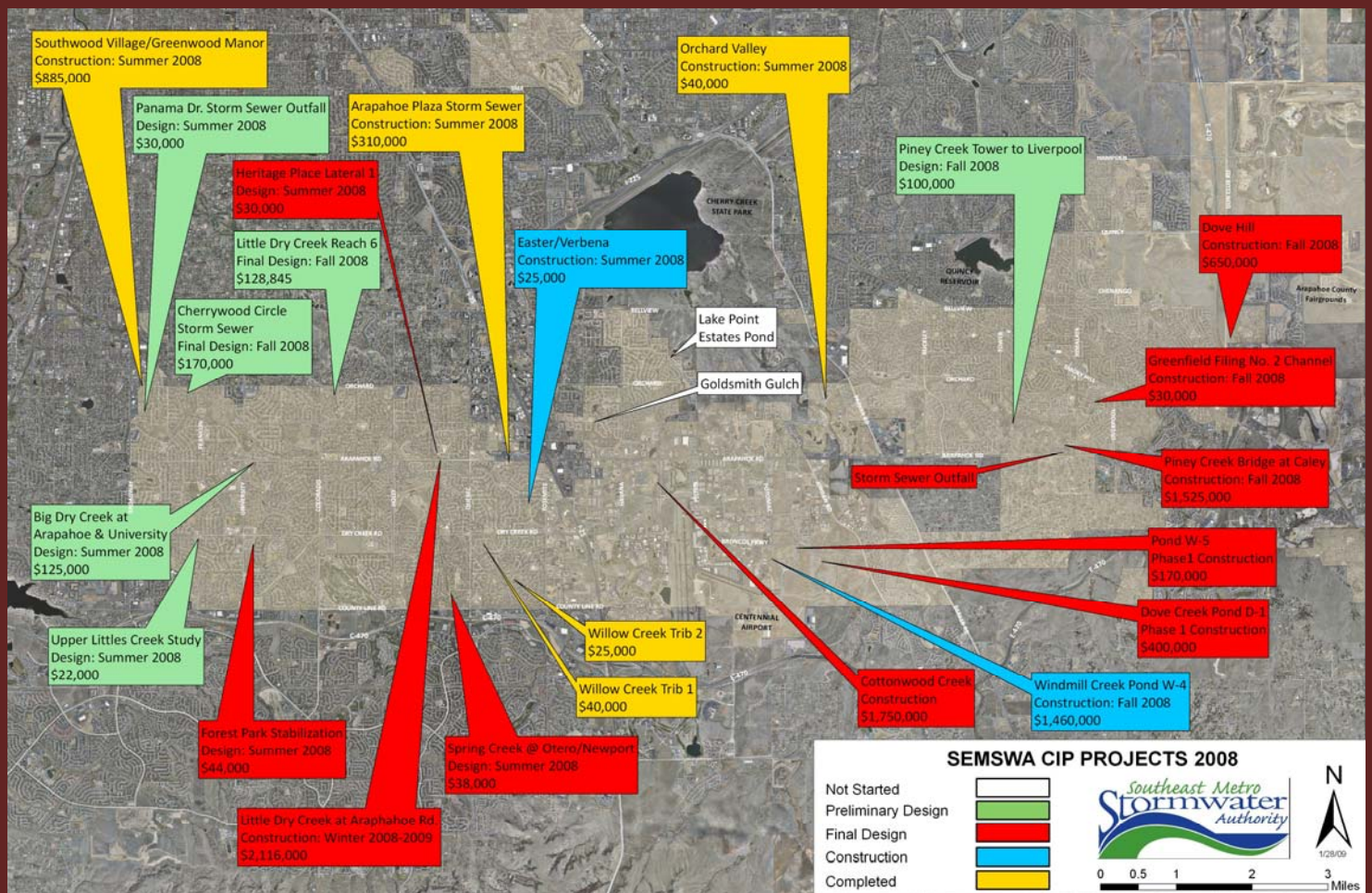
- Repair/replace/retrofit aging and undersized conveyance systems
- Construct new systems to ensure safe and efficient conveyance of stormwater
- Stabilize stream channels to handle increased urban stormwater runoff from upstream areas
- Repair channels/banks to minimize sediment transport with stormwater runoff
- Address local bank erosion problems in a reach or at a control structure

Several CIP construction projects were completed in 2008:

- Orchard Valley Overflow Conveyance Improvements (\$40,000)
- Little Creek at Clarkson & Geddes System Evaluation – Phase I (\$22,000)
- Little Dry Creek tributary at Castlewood Library Storm Sewer (\$310,000)
- Big Dry Creek at Southwood Neighborhood Outfall System (\$885,000)

Several CIP projects were final designed during 2008 for construction starting in late 2008 and continuing into 2009:

- Little Dry Creek at Arapahoe Road Conveyance Improvements (\$2,116,000)
- Dove Hill Estates Conveyance System (\$650,000)
- Piney Creek at Caley Replacement Bridge (\$1,525,000)
- Cottonwood Creek at Easter Stream Stabilization (\$1,750,000)
- Windmill Creek Stormwater Pond W-4 (\$1,460,000)
- Dove Creek Stormwater Pond D-1 Phase I (\$400,000)
- Windmill Creek Pond W-5 Phase I (\$170,000)
- Piney Creek at Greenfield Filing #2 Tributary (\$30,000)



CIP 2008 Construction Activities...



Before



Orchard valley at Cherry Creek Overflow Improvements



After



Southwood Village Conveyance and Outfall Improvements to Big Dry Creek



Little Dry Creek tributary at Arapahoe Plaza Storm Sewer Improvements



CIP 2009 and beyond...

Several CIP projects will be final designed in 2009 for construction beginning in late 2009 and beyond:

- Piney Creek, Tower to Liverpool Stabilization (\$100,000 design)
- Little Dry Creek Reach 6 Stream Stabilization (\$128,845 design)
- Big Dry Creek at Arapahoe Road & University Blvd Bridge Conveyance Improvements (\$125,000 design)
- Panama Drive Drainage Storm Sewer Improvements (\$30,000 design)
- Cherrywood Circle Storm Sewer System (\$170,000 design)
- Cherry Creek at Cherry Creek Valley Ecological Park Stream stabilization (\$100,000 design)
- Heritage Place Storm Sewer Improvements (\$30,000 design)
- Spring Creek Tributary to Willow Creek Stabilization (\$38,000 design)
- Big Dry Creek at Forest Park Stabilization (\$44,000 design)



Big Dry Creek at Arapahoe Bridge

Windmill Creek Regional Pond W-4 Groundbreaking...

On a cold December day, SEMSWA celebrated the start of construction on Pond W-4 with a groundbreaking ceremony. The Windmill Creek Regional Detention Pond is a master planned, 22 acre-foot detention pond that will enable continued development within the Windmill Creek Basin. The pond is located at the southwest corner of E. Broncos Parkway and S. Potomac Street. Improvements include a cast-in-place concrete outlet structure, a wetland bottom channel and a boulder drop structure. The construction contract was awarded to American Infrastructure, Inc., at a cost of \$902,200. It is anticipated that construction will be completed by Spring 2009.



Water Quality Program...

The goal of SEMSWA's Water Quality Program is to reduce the amount of pollutants in stormwater runoff entering streams, lakes, and rivers from residential, commercial, and industrial areas. SEMSWA is required to develop and implement stormwater management best management practices (BMPs), or minimum control measures, in six program areas. These control measures, when implemented together, are expected to reduce pollutant discharges into our valuable waterways to the maximum extent possible. The six controls include effective programs to:

- Encourage the public to be willing partners in efforts to minimize pollutants (education outreach) **1**
- Actively engage the public in efforts to minimize pollutants (public participation) **2**
- Trace, investigate, and eliminate illicit discharges to the stormwater system (improper dumping) **3**
- Reduce pollutants in stormwater runoff from construction activities (grading, erosion, and sediment controls) **4**
- Reduce pollutants in any stormwater runoff after construction activities are completed (post-construct pollutant controls) **5**
- Reduce pollutants in runoff associated with municipal operations (good housekeeping/pollution prevention) **6**

An Annual Report was prepared on activities conducted in support of the six program areas and submitted to the Colorado Department of Public Health & Environment. As of 2008, the City of Centennial and East Cherry Creek Valley Water & Sanitation District stormwater quality permits have been transferred to SEMSWA.



1



2



3



4



5



6

Public Outreach Program

- More than **20** education and outreach events, including booths at public events, judging at science fairs, inlet labeling, volunteer cleanup and planting events, and teacher training
- **4** Eagle Scout projects, including storm sewer inlet labeling and drainageway restorations
- More than **10** school and teacher education and training events
- **9** events enabling participants to 'get to know their watershed'
- **7** events for the public to integrate watershed interests and expand stewardship efforts
- **12** Colorado Community Newspaper ½-page water quality messages



Construction and Post Construction Programs

- Over **150** active construction sites in SEMSWA Service Area
- Over **1,500** inspections performed by Water Quality Program staff
- Enforcement actions include **34** follow-up Re-inspection Fees, **2** Warning Letters,
- **2** Pre-Notice of Violation (NOV) Warnings, **1** NOV Stop Work Order
- Over **25** Permanent Water Quality BMPs inspected annually



Illicit Discharge, Detection and Elimination Program

- **51** potential improper discharge concerns investigated
- **12** illicit discharge violations (potential for direct transport to waterway)
- **123** letters sent to residents for grass clipping education
- **520** residential curb-side collections for recycling by Curbside, Inc.
- **42,000** pounds of waste collected during curb-side collections



The SEMSWA Floodplain Management Program utilizes corrective and preventative measures to reduce flood event damage to public and private properties through a variety of components including:

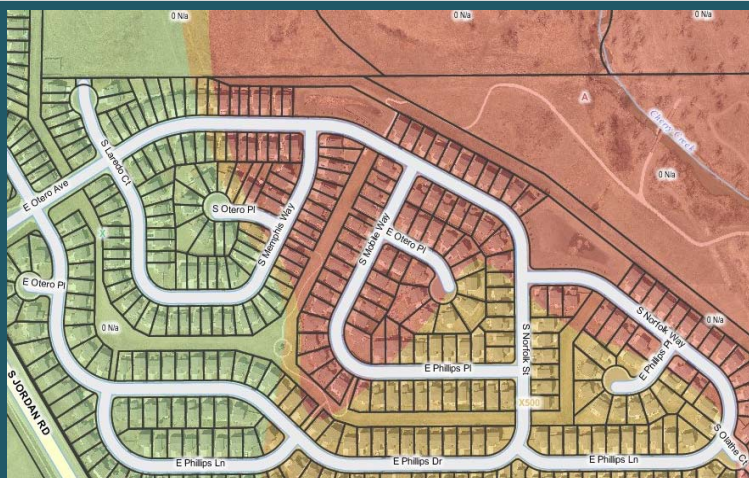
- Sensible development ensuring No Adverse Impact using floodplain management regulations and criteria
- Participating in Flood Insurance Rate Map (FIRM) updates and Flood Hazard Area Delineation (FHAD) studies
- Administering Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) that regulates floodplains and provides access to flood insurance
- Ensuring Emergency Response Procedures are in place

During 2008, SEMSWA participated in acquiring 2-foot contour topography from Light Detection and Ranging (LiDAR) data that greatly increases the resolution for floodplain mapping applications. An additional important project was the initial review of the new digital FIRMs (DFIRMs) from FEMA for the City of Centennial and Arapahoe County. FIRMs are a critical component of floodplain management, assisting the evaluation of the impact of development on the floodplain. FEMA grants the citizens and businesses in SEMSWA's Service Area access to affordable flood insurance as long as SEMSWA regulates and manages the floodplain, and the DFIRMs will be a valuable tool. An estimated 107 properties in the SEMSWA Service Area have a floodplain insurance policy (59 in the City and 48 in the County).

Floodplain Management Program...

2008 Floodplain Program statistics:

- 16 floodplain inquiries from the public
- 41 floodplain inquiries from Building Department staff
- 2 floodplain referrals from other entities
- 31 Floodplain Permits reviewed/approved
- 4 Map Revisions reviewed
- 3 floodplain modeling studies reviewed



Existing FIRM showing floodplain (pink property) IN



New DFIRM showing updated floodplain, property OUT

Master Plans are critical tools in ensuring there is adequate urban storm drainage infrastructure and flood control within the SEMSWA Service Area. Adequate infrastructure means that appropriate facilities are constructed for current and future development, as well as identifying regional solutions to watershed infrastructure needs. Master planning is when SEMSWA evaluates urban runoff and establishes parameters for successful development and redevelopment, and tests out alternative scenarios of changing needs. An important part of the master planning process is public input because only people that have lived in an area for any length of time can verify what the modeling results say will happen in a frequent storm event. In addition, no matter how much time the master plan consultant spends in the drainageway, they'll miss some localized problem that needs to be added to the planning for future work efforts. Finally, it has been proved time and again that the more people connect to their watershed, the more they will become advocates for active stewardship.

During 2008, SEMSWA completed the Dutch, Lilley, & Coon Creeks and 3-Lakes Tributary Phase B Major Drainageway Planning study, and Murphy Creek Outfall Systems Plan (OSP). Additionally, five extensive master planning studies were started, to be completed in 2009:

- Lower Cottonwood Creek OSP
- Lone Tree, Windmill, and Dove Creek Major Drainageway Plan & FHAD
- Willow & Little Dry creeks and Greenwood Gulch Major Drainageway Plan & FHAD
- First Creek Gulch Major Drainageway Plan & FHAD
- East Toll Gate Gulch Major Drainageway Plan & FHAD

In addition, SEMSWA worked with the Centennial Airport Board in 2008 on their master planning efforts in the airport area.

Master Planning Program...

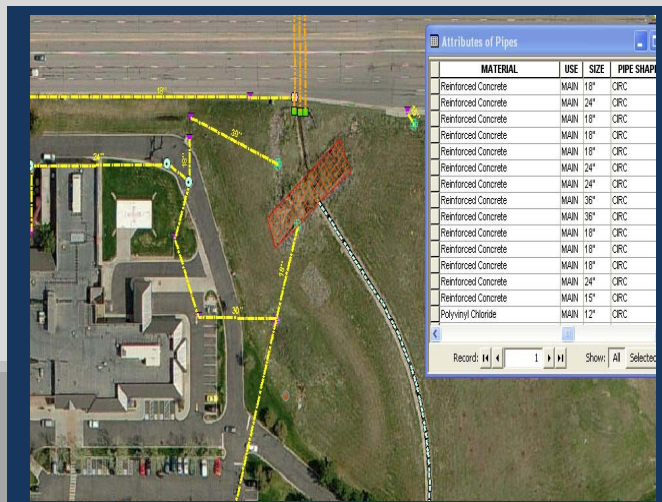


GIS Program...

During 2008, SEMSWA continued the drainage inventory system data collection, documentation and verification efforts that started in 2007. A Technical Memorandum was prepared to summarize the data, source, coordinate system, quality and level of detail, as well as the framework of the Geographical Information System (GIS) database in terms of file structure, component summary, and attribute information. The GIS database efforts in 2008 included:

- The assessment and re-design of the GIS database (Geodatabase) created from As-built drawings, drainage inventory maps, and field GPS efforts. SEMSWA's Geodatabase design has taken into account existing stormwater models and terminology, as well as other asset management and geospatial software programs in use.
- The participation in a citywide LiDAR project resulting in detailed elevation data. In addition to greatly improving the overall GIS database and stormwater flows, this elevation information is proving useful for Floodplain & Master Planning, Land Development, and CIP programs.
- The establishment of an in-house GPS program focused on gathering sub-meter accuracy positions and associated attributes of the entire stormwater system within SEMSWA's jurisdiction.
- Further development of the asset inventory and valuation to estimate the asset value and condition of components in the drainage inventory.

In addition, 2008 efforts included updating GIS components, creating a process and specified procedures for outside agencies to use when providing data to SEMSWA, developing standards for survey and GPS collection by SEMSWA staff, and incorporating additional query, reporting and other features to the GIS database to streamline mapping efforts.



The goal of SEMSWA's Customer Service Program is to provide a rapid response to queries regarding stormwater management fees and services. During 2008, **600** Customer Service Inquiries (CSIs) were received and responded to. These CSIs can be categorized as follows:

- **90** Stormwater system maintenance requests
- **440** Assessed fee and delinquent fee inquiries by citizens and Title companies
- **70** General information requests

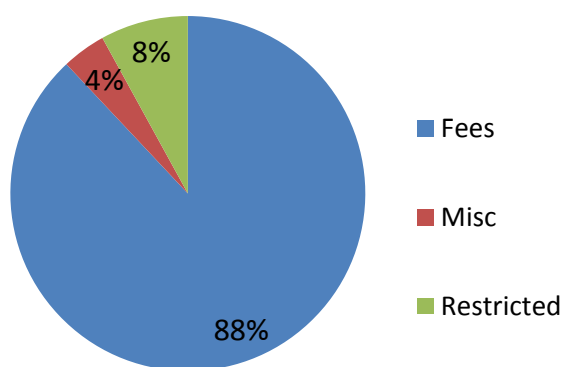
SEMSWA's Customer Service representative can be reached at **303-858-8844**.

Customer Service...

SEMSWA Financials...

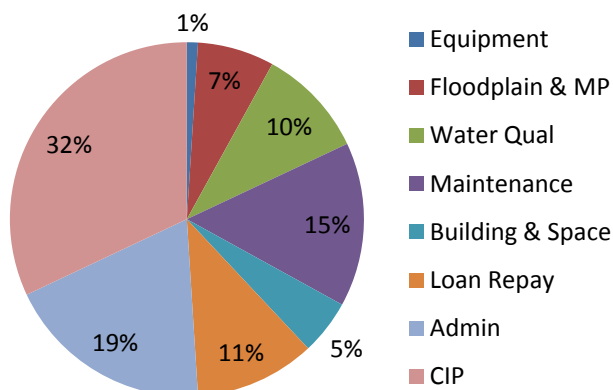
SEMSWA is a political subdivision and a public corporation of the state, falling under the guidelines of Colorado State Statute for a "drainage authority" (29-1-204.2 C.R.S.). This Statute permits collection of stormwater fees, which are fees for stormwater management services. There are two standard methods of charging for stormwater services in use by SEMSWA and others in metro Denver and Colorado as well as across the country: 1) stormwater utility fees, calculated as an annual charge to residential and non-residential property owners based on impervious area per property; and 2) new development fees, referred to as a 'System Development Fee', calculated per acre and paid by developers. SEMSWA sets fees at levels to insure there are funds available to properly manage stormwater and to meet EPA & State regulatory requirements. The 2008 revenues and expenditures are illustrated below.

SEMSWA Revenue 2008



Revenues for 2008: \$9,285,550

SEMSWA Expenses 2008



Expenditures for 2008: \$7,463,602