

## Message from the Executive Director

In the four years that SEMSWA has been collecting a stormwater management fee, we've seen a steady increase in the number of capital improvement projects under construction. In the first years of SEMSWA's existence, many capital projects were in the design phase. Now, SEMSWA is implementing our commitment to construction of improvements that were envisioned when SEMSWA was formed to manage stormwater in the southeast Metro Denver area.

Initially, a design process is used to find the best solution to a problem, which takes from nine months to two years to complete. Then the bidding and contract award process begins, followed by formalizing contract documents and permitting. The goal is to be able to take advantage of a favorable bidding climate when contractors are eager for work, by getting prioritized projects final-designed, on the shelf and ready to go out to bid. SEMSWA saw the beginning of more competitive bids in early 2009, so an effort has been made towards building up the backlog of shelf-ready projects. We are now seeing the benefit of that goal with numerous high priority projects completed.

We welcome your interest in SEMSWA's stormwater management efforts as you read about our various activities in 2010. Please contact us with any questions or comments.

*John A. McCarty, PE*

## Major 2010 Board Funding Actions for Capital Projects

### January:

- Construct Windmill Creek Regional Pond W-5 (\$230,000)
- Design/Construct Windmill Creek Wetlands (\$100,000)
- Design Windmill Creek Pond W-1, Phase I (\$100,000)
- Design/Construct Euclid/Oneida Storm Sewer System (\$160,000)

### February:

- Construct Cherrywood Circle Storm Sewer (\$952,600)
- Design Gun Club Road Pond (\$200,000)
- Design Piney Creek Stream Restoration (\$200,000)
- Design/Construct Cherrybrook Pond (\$340,000)

### March:

- Design/Construct East Caley Pond (\$240,000)

### June:

- Construct Cottonwood Creek @ Easter (\$1.4 million)
- Construct Cherrywood Circle Storm Sewer (\$47,400 add'l)

### July:

- Design/Construct Lone Tree Creek Regional Pond L-1 West (\$232,000)

### September:

- Construct Euclid/Oneida Storm Sewer (\$20,000 add'l)

### October:

- Construct Piney Creek Stream Restoration (\$250,000)

### December:

- Design Dove Creek Regional Pond D-2 (\$100,000)
- Design/Construct Willow Creek Stabilization, Quebec To Dry Creek (\$200,000)
- Construct West Toll Gate Creek @ Fox Hill Park (\$548,000)
- Design Little's Creek Improvements (\$50,000)



# Capital Improvement Program...

The Capital Improvement Program (CIP) constructs projects to ensure safe and efficient control of stormwater. CIP projects integrate water quality, maintenance, floodplain, and land development codes, standards, and criteria to optimize construction efforts and meet the master planned goals for stormwater management. Typical projects include:

- Replace/repair/retrofit aging and undersized conveyance systems
- Construct new stormwater conveyance systems and facilities where master planned
- Stabilize stream channels and retrofit facilities to handle increased urban stormwater runoff



Before

Spring Creek Stream Stabilization



After



Before



Cottonwood Creek @ Easter



After

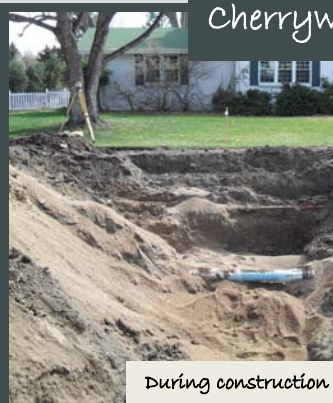
CIP projects completed in 2010 include:

- Piney Creek, Stream Stabilization, and Outfall C Conveyance, including Caley Bridge (\$2,808,000)
- Cottonwood Creek @ Easter Ave Stream Stabilization (\$1,400,000)
- Dove Creek Regional Pond D-1 (\$700,000)
- Windmill Creek Regional Pond W-5 (\$290,000)
- Cherrywood Circle Storm Sewer System (\$945,700)
- Spring Creek (Willow Creek Tributary) Stream Stabilization (\$277,000)
- Euclid/Oneida Storm Sewer System (\$174,000)

CIP projects final designed in 2010, with construction anticipated in 2011, include:

- Cherry Creek Stream Stabilization at the Eco Park
- Willow Creek Stabilization, Quebec to Dry Creek
- Cottonwood Creek East Caley Pond Retrofit
- Lone Tree Creek Regional Pond L-1 West
- Windmill Creek Regional Pond W-1, Phase 1
- Lone Tree Creek Regional Pond L-2, Phase 1
- Cherry Creek @ 17 Mile House Park Drop Structure
- Dove Creek Regional Pond D-2
- Big Dry Creek Trib @ Forest Park Channel & Bank Stabilization
- Piney Creek Stream Restoration

Cherrywood Circle Storm Sewer System



During construction



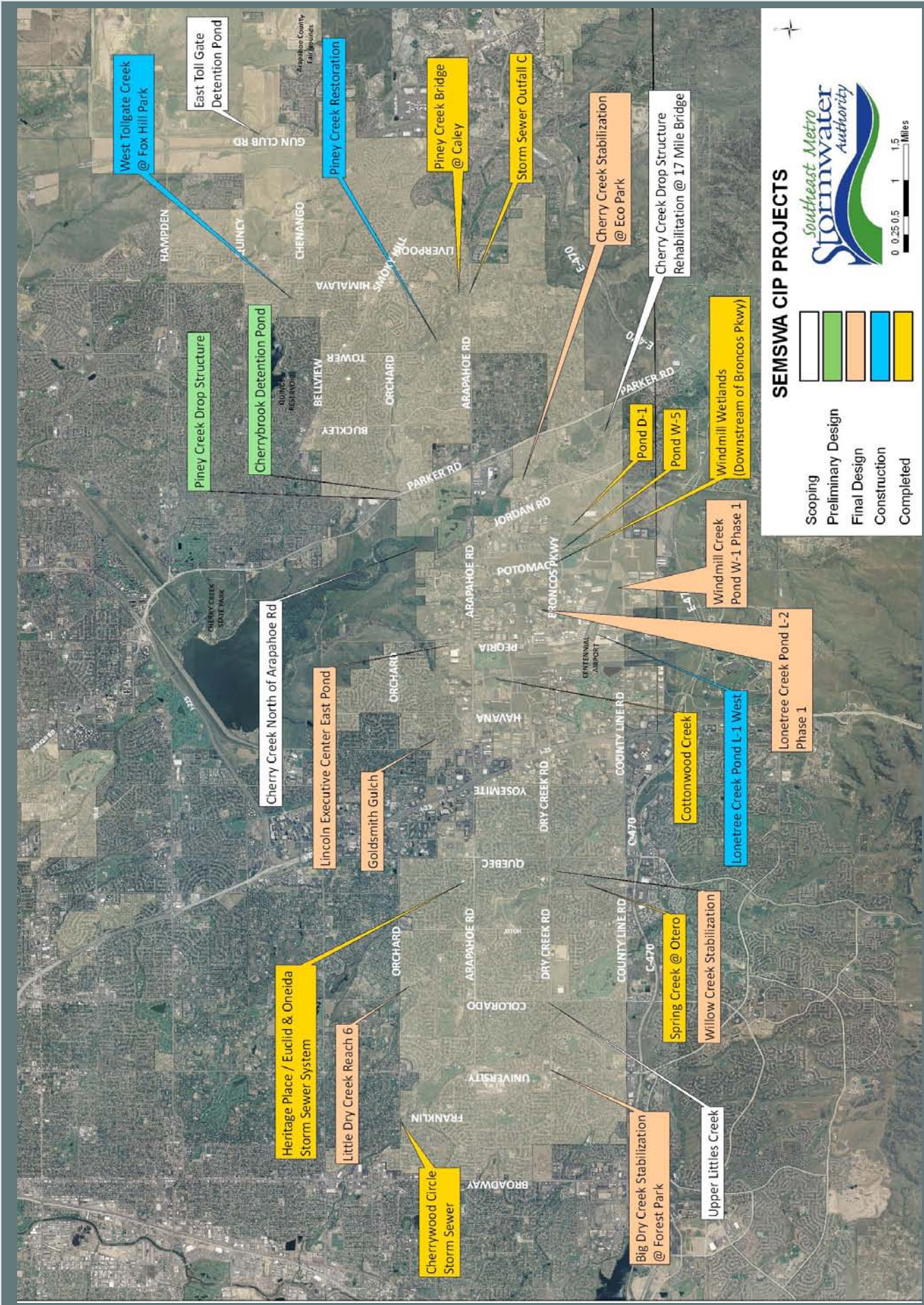
05/14/2011



After

Dove Creek Regional Pond D-1





# 2010 Capital Construction Program

# Piney Creek Stabilization and Caley Bridge Project



Before

Piney Creek  
Stream  
Stabilization



After



Before



Caley  
Bridge over  
Piney Creek



After

## Basin Focus: Lone Tree, Windmill & Dove Creeks

You might think it is a stretch to say that stormwater management could have an affect on the economics of the area, but that is exactly the case in the Lone Tree, Windmill, and Dove Creek basins, located roughly west of Parker Road, north of Centennial Airport, east of Havana Street, and south of Cherry Creek State Park. Here's why: Arapahoe County and the City of Centennial Land Development Codes require stormwater runoff detention and water quality enhancement to be part of every development site plan. The unique thing about these basins is that they have a regional system in place to accomplish these water quantity and quality requirements. This means that these controls are accounted for in a 'shared' stormwater facility instead of 'individually' on each site. However, the regional system must be built and must "have room" in the facility to take care of the runoff associated with the new development. If not, the owner must provide these controls temporarily on their site until the regional system is completed. What SEMSWA did in 2010 is get ahead of the development in this area during this down time in the economy when money to develop is tight. Several regional facilities were constructed, and several more were designed in 2010. With competitive bids from construction contractors, SEMSWA may be able to complete the regional system for these basins in 2011, allowing owners to develop their entire site, with no need to reserve valuable developable land for a temporary control facility. This is good for the developer, and economically positive for Arapahoe County, the City of Centennial, and SEMSWA ratepayers.



The Department of Natural Resources, Colorado Water Conservation Board, has finalized the *Rules and Regulations for Regulatory Floodplains in Colorado*. New regulations for structures in the floodplain that generated a lot of discussion statewide were 1) the more stringent requirements for the floodway, that area of the drainageway that has to remain open for conveyance, and 2) freeboard, a measured vertical height that allows for additional flood protection between the elevation of the flood or ground and the structure. For both of these, Arapahoe County and City of Centennial already meet the new criteria with their existing regulations as well as zoning requirements that do not allow new structures to be built in the floodplain. Additionally, there are new requirements for protection of "Critical Facilities", those facilities, like hospitals, that require an extra level of protection from a flood event. This will require a change to both County and City Land Development Codes by 2013. It was a major step to have stricter state-wide regulations governing floodplain management finalized. The outcome was an effective collaboration across all watersheds that will provide consistent requirements for the protection of Colorado citizens from a 100-year flood event.

## REVISED Floodplain Tools

SEMSWA made revisions to the *Floodplain Development Permit (FPDP)* in 2010 to better manage construction activity in the floodplain, and prepared a *Checklist for Conditional Letters of Map Revisions (CLOMRs)*, and for *Final Letters of Map Revisions (LOMRs)* with their associated as-built drawings. These forms are available on the website, [www.semswa.org](http://www.semswa.org).

## DFIRMS Now Effective!

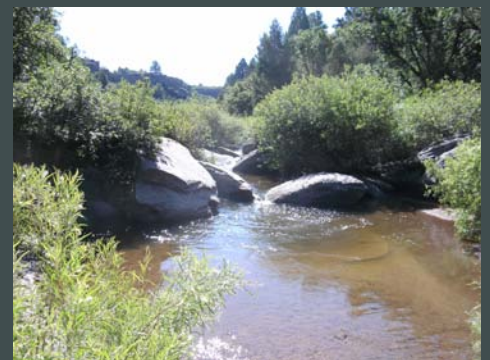
Digital Flood Insurance Rate Maps (DFIRMS) are a critical component of floodplain management, assisting greatly in the evaluation of proposed developments in the floodplain. After a 5-year process by the Federal Emergency Management Agency (FEMA) to update and digitize these maps, they became effective for the City of Centennial and Arapahoe County in December, 2010. DFIRMS are available on the SEMSWA website.

## Floodplain Outreach

SEMSWA prepared a new pocket guide for owners living in, or adjacent to, a floodplain regarding *Flood Insurance*. This brochure is the 3<sup>rd</sup> in the SEMSWA Floodplain Education Series. Other pocket guides available are the *Construction Requirements for Working in the Floodplain* and *Planning and Constructing Improvements in the Floodplain*. These are available at the SEMSWA office or can be requested by calling 303-858-8844. As part of the on-going effort to improve Arapahoe County and the City of Centennial's Community Rating System (CRS) scores that results in discounted flood insurance for its citizens, SEMSWA staff completed a "Building Footprint" GIS study. This mapping more correctly identifies structures in and adjacent to the floodplain. Subsequent letters were sent to all affected property owners with this information, accompanied by the *Flood Insurance* brochure.

## Floodplain Program Stats

- 69 Floodplain Development Permits reviewed, approved & issued
- 31 Floodplain Studies reviewed
- 45 Floodplain Information inquiries addressed
- 4 Floodplain violations
  - 2 for extending backyard structures into the floodplain
  - 2 for unauthorized filling in the floodplain or stream channel



## Master Planning Program...

Master Planning includes the preparation of several types of documents in order to establish drainageway stabilization, regional detention and water quality, and floodplain limits for successful development/redevelopment. Master Planning involves every stormwater management program at SEMSWA, and must include future water quality requirements and upgrades, best-available-data, floodplain modeling and delineations, maintenance needs based on inventory and asset management data, as well as citizen concerns. Additionally, SEMSWA CIP project lists reflect only those improvements that have been master planned, and land development reviews include an assessment of the applicable master plan to make sure the development accounts for those improvements. During 2010, SEMSWA in conjunction with UDFCD, completed several master planning documents and initiated several others, including:

- First Creek Master Development Plan (MDP) and Flood Hazard Area Delineation (FHAD)
- Upper East Tollgate Creek MDP and FHAD
- Lower Cottonwood Creek Outfall Systems Plan (OSP) and FHAD
- Cherry Creek Stabilization Plan (downstream of the dam)
- Willow Creek FHAD

Three additional extensive master planning studies were initiated in 2010:

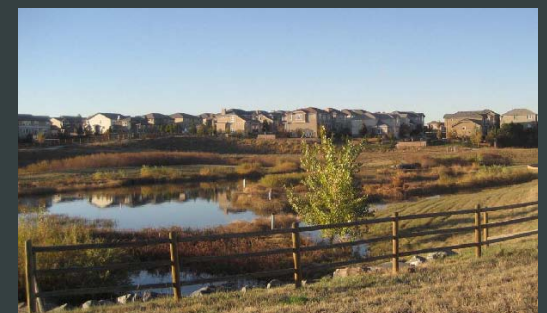
- Piney Creek OSP and FHAD
- Little's Creek (upstream of Broadway) OSP and FHAD
- West Toll Gate Creek MDP and FHAD



## Land Development Coordination Program...

The Land Development staff continued the coordination of land development opportunities within Arapahoe County and the City of Centennial to meet the objective of comprehensive, efficient, and effective stormwater management. This ensures that the community has well-planned, adequate, and long-term stormwater infrastructure. In 2010, SEMSWA received a combined total of 88 referrals from the County and City, as compared to 78 referrals in 2009. A summary of the land development referrals is highlighted in the following table.

Project Type	City	County	SEMSWA	Total
Private Development	43	39	0	82
Capital Construction	3	3	7	13
<b>TOTAL</b>	<b>46</b>	<b>42</b>	<b>7</b>	<b>95</b>

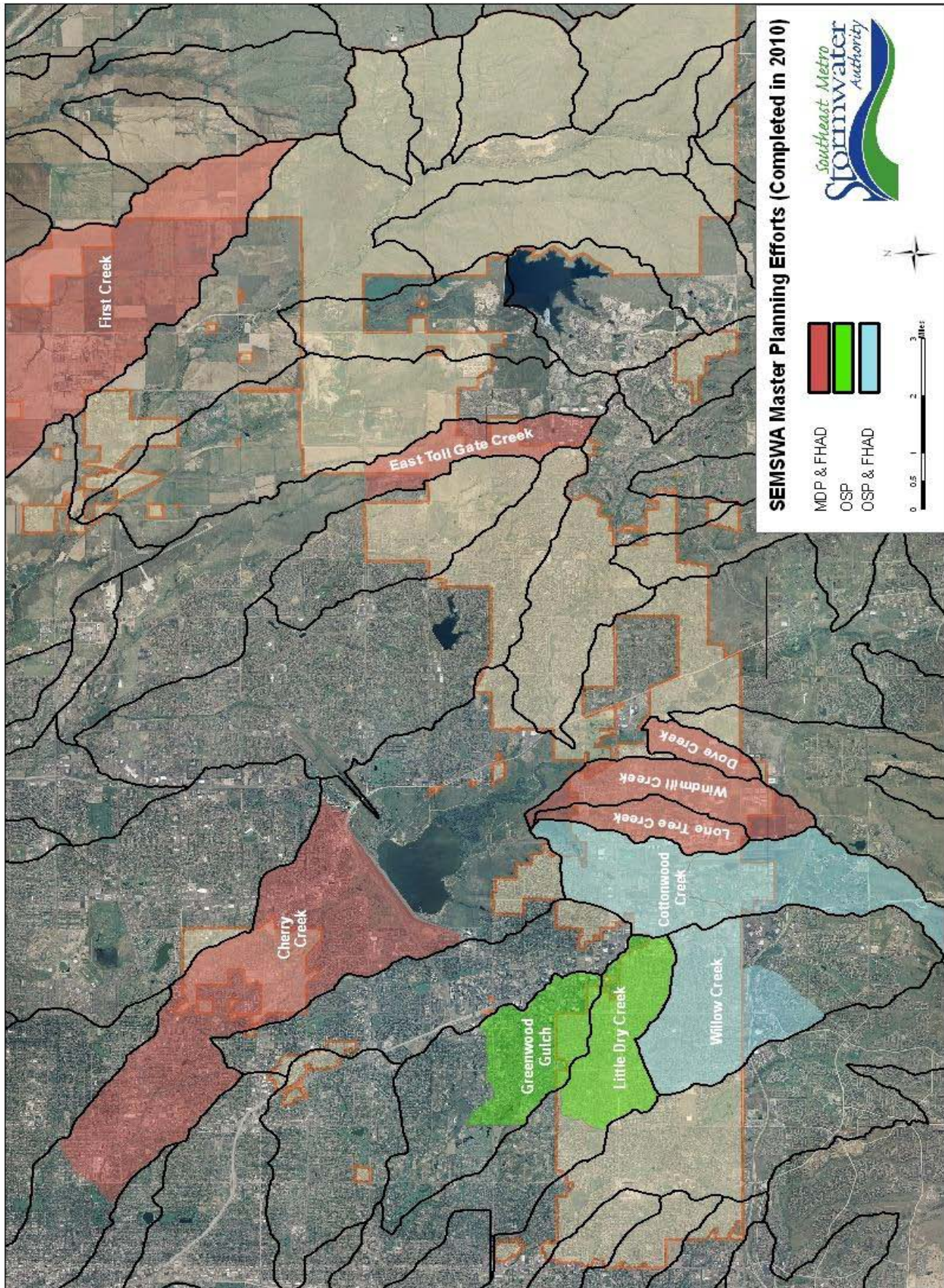


### SEMSWA Fees

In December (effective January 1, 2011), SEMSWA revised the System Development Fees (SDFs) for the Lone Tree, Windmill and Dove Creeks (LTWDC) basins. These fees are the means by which developers pay their fair share of future capital infrastructure projects to account for the added impact on the stormwater system from the development. The LTWDC Master Plan was updated in 2010, with an updated list of future capital projects necessary in these basins, which then required an update in the calculated SDFs.

In addition to the new SDFs, a new Excess Capacity Fee (ECF) will be utilized to provide SEMSWA a means of recouping its investment in the on-going construction of regional detention and water quality facilities to support future development in the LTWDC basins. Previously, these costs were borne by existing SEMSWA ratepayers. By incorporating an ECF, developers which benefit from the recently constructed regional facilities will be assessed an ECF for their impervious areas and will share in the cost. The benefit to the developer is the ability to utilize the regional facilities, eliminating or significantly reducing costly on-site facilities.

SEMSWA also adopted new review and permit fees in April 2010, after a 'cost of service' analysis and public input, to replace some of the existing fees currently collected by the County and City. All Fee information is available at [www.semswa.org](http://www.semswa.org).



# Master Planning Documents Completed in 2010

# Maintenance Program...

The SEMSWA Maintenance

Program is responsible for maintaining culverts, pipes, channels and other stormwater infrastructure to effectively convey stormwater to a major drainageway. The following infrastructure maintenance activities were conducted in 2010:

- **1,827** storm grates cleaned
- **256** vaults cleaned and flushed
- **3,980 feet** of storm sewer pipe cleaned and flushed
- **5,625 tons** of sediment removed
- **835 tons** of trash and debris removed
- **227** requests for service responded to by staff

In addition, almost **15,816 feet** of storm sewer lines were inspected, **5,244 lineal feet** of channel ditches were reconstructed, and **82** detention ponds were maintained by maintenance crews in 2010. Over **20** maintenance rehabilitation projects were also constructed. Both a comprehensive weed removal project and a mosquito abatement program for ponds were integral components of maintenance activities in 2010.



The Maintenance Program crews also assisted in several infrastructure projects, including construction of a water quality swale to Lone Tree Creek to treat runoff from the new Bronco's Parkway widening effort, and protection of the Piney Creek Regional Trail with embankment reinforcement.

## What if an HOA wants SEMSWA to maintain their facility?

Important to the preparation for a maintenance project is the determination of whether the property is private or publically-owned. SEMSWA fees are collected "for the common good", meaning that private property does not qualify for SEMSWA maintenance or construction funds. However, if a drainage easement is obtained from the Homeowner Association (HOA) for a potential regional facility that provides SEMSWA rights pertaining to maintenance and drainage functions, it can now be considered in public ownership and a benefit to the overall system. With this easement, SEMSWA will maintain the facility to ensure functionality for its part in the regional system, with rights limited to the enhancement or assurance of drainage functions. Although not every HOA facility will be one that is of regional interest to SEMSWA, every effort is made to assist the HOA in performing effective maintenance of their facility to benefit the collective stormwater management system.

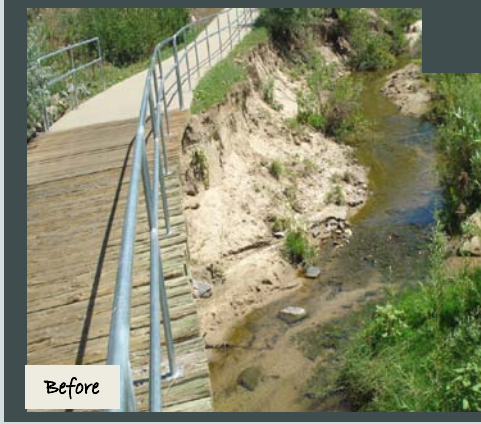




# Maintenance Program project highlights....



## Holly Street Inlet Modification



## Piney Creek Embankment, Trail Protection



## Bronco's Parkway Water Quality Swale



## Hunters Hill Area-Inlet Placement



# Water Quality Program...



1



2



3

## Household Hazardous Waste

SEMSWA has a contract with Waste Management (WM) for a Household Hazardous Waste (HHW) annual collection program to maximize our recycling potential. WM Curbside offers a door-to-door HHW collection program for the proper disposal and recycling of leftover household hazardous materials for residents of unincorporated Arapahoe County and Centennial. Residents call a toll-free hotline (800-449-7587) operated by WM Curbside to schedule an annual collection. The operator qualifies the caller, determines the types and quantities of acceptable material, and schedules a collection date. The cost to the resident is \$20.00. SEMSWA picks up the remainder of the cost, about \$90 per household collection.

SEMSWA is required by our State Stormwater Quality Permit to reduce the amount of pollutants in stormwater runoff entering streams, lakes, and rivers from residential, commercial, and industrial areas by implementing six management strategies, as follows:

- 1 Encourage the public to be willing partners in the effort to minimize pollutants, including **educational outreach** at public events and workshops
- 2 Actively engage the **public to participate** in efforts to minimize pollutants, including volunteer events, natural resource inventories, and encouraging collaboration among regional entities
- 3 Trace, investigate, and **eliminate illicit discharges**, and promote “at the curb” recycling and proper discharge of household hazardous wastes
- 4 **Reduce pollutants in stormwater runoff from active construction sites** through erosion control Best Management Practices (BMPs)
- 5 **Reduce pollutants in stormwater runoff after construction** with Permanent Water Quality BMPs & ensure BMPs are adequately maintained
- 6 Reduce pollutants in runoff associated with SEMSWA municipal operations utilizing **good housekeeping/pollution prevention strategies**

**GESC Construction BMPs**  
Grading, Erosion and Sediment Control Best Management Practices

(BMP Poster is available by contacting SEMSWA at 303-858-8844)



5



6

# Public Outreach Program...

SEMSWA staff strengthens the connection between people and drainageways with numerous and varied outreach activities. Activities range from staffing booths at neighborhood celebrations and resource fairs to building awareness of water resources with field trips and day-long service workshops. Some examples of public outreach activities in 2010 include:

- National Night Out Celebration in the Walnut Hills Neighborhood
- Cherry Creek "Run for The Watershed" Relay Rally Race
- "Explore the Ecology of Cherry Creek" Teachers Workshop
- Activities at Arapahoe County Fair promoting water quality

**SEMSWA in the Walnut Hills neighborhood...**

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

**Projects in the Walnut Hills neighborhood include:**

- Easter-Vorheis Pipe, Inlet and WQ Swale Installation
- Arapahoe Plaza tributary to Little Dry Creek Pipe Installation
- Tamarac Court Concrete Pan Replacement
- Drainage Easement tree removal, various locations
- Briarwood Inlet Repair
- Little Dry Creek channel debris removal

**Maintenance Statistics:**

- 103 inlets inspected & cleaned
- 24 corrugated metal pipe (CMP) inspected/inventoried
- 24 outfalls inspected
- All storm inventory mapped

**Activities:**

- Walnut Hill Inlet Replacement
- Tamarac Concrete Pan Replacement
- Easter at Vorheis Pipe

Southwest Metro Stormwater Authority [www.semswa.org](http://www.semswa.org)



## Calling all volunteers!

It's not just the investment in infrastructure or regulations that contribute to enhanced water quality. The opportunities provided by connected trails and open space inspire active stewardship volunteer projects that can enhance the riparian floodplain areas by focusing on restoring and protecting our stream corridors. This works best when volunteer efforts are built into projects early, as with some of the SEMSWA stream stabilization and maintenance re-vegetation efforts. SEMSWA has plans to incorporate Standard Operating Procedures (SOPs) and specifications for volunteers into contracts, to encourage public-private partnerships and volunteerism for the benefit of water quality. This approach serves both SEMSWA's construction efforts and can serve the needs of groups looking to engage in active stewardship. Let us know if volunteering is of interest to your group.

**Southeast Metro Stormwater Authority**

**Fact Sheet on Standard Operating Procedure**

**Use of Volunteers for Planting**

**Why**

Standard Operating Procedures (SOPs) are present for SEMSWA activities that will occur with daily or infrequent operations or SEMSWA projects and provide a mechanism for training. One of the goals of the SOPs is to ensure that all personnel involved in the project are trained in the correct way to perform the task.

**What**

Volunteer Planting and Monitoring Volunteers can be used for the installation of vegetation and follow-up monitoring operations on SEMSWA projects. This activity applies to appropriate projects in both the Capital Improvement Program (CIP) and Maintenance Program but not to projects that have a partner organization, such as the Cherry Creek Stewardship Partners, that is capable of installing the work. As a benefit of an volunteer project conducted under the auspices of SEMSWA are standard safety, practice template benefits to SEMSWA employees and give contractors satisfaction in contributing to the community.

**How**

Identify volunteer projects to be a schedule as possible, preferably before final design. Consider using volunteers for installation of construction plantings and the follow-up monitoring, weeding, watering, inspection of erosion control, weeding, and follow-up negative monitoring observation.

Make proper maintenance an integral part of the project to avoid long-term maintenance costs. SEMSWA's role will be to provide the plant stock and provide training on the technical aspects.

The program goals that are clear and measurable.

For identified projects, make sure that the contract agreement between SEMSWA and the group involved includes the details of the work and specify the number of volunteers needed for the project as well as sufficient funds to provide general expenses for plant material and follow-up observation.

Coordinate with the partner organization and work together to take care of safety including, secure materials, work activities and materials, safety plan, first aid kit, and emergency call, and management, use proper preparation, and follow-up observation monitoring.

Ensure the staff and use of the resources with the appropriate skills.

Can be observed early and well-being by providing appropriate shelter and ensuring that the project area and work areas are safe.

Make a look at plan to close of volunteer weather or inclement weather.

Make the SOP the most up to date from resources and responsibilities and required structures and equipment.

Obtain the volunteer and partner organization contributions to the community.

**Who**

SEMSWA employees and contracted companies responsible for use of Volunteers in Planting and Monitoring.

**Where**

SEMSWA stormwater facilities and projects that require observation and care appropriate to conditions.

**DON'T**

DO NOT give a list of volunteer projects to a partner organization. A partner organization is not authorized for using volunteer resources and equipment.

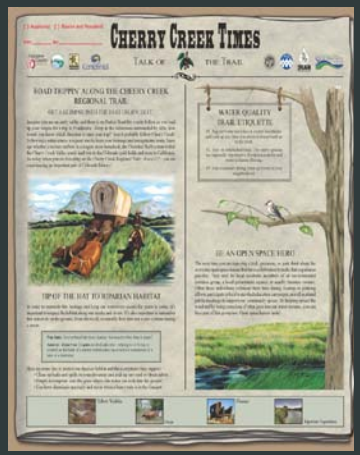
DO NOT begin to monitor the follow-up observation monitoring during project completion.

DO NOT have volunteers unprepared.

DO NOT allow volunteer use of tools that require special training or licensing (e.g. chainsaw).

## Informational Signage

Signage is a valuable way to provide outreach that encourages water quality stewardship and provides ratepayers the opportunity to check in with SEMSWA's efforts to protect and enhance water quality during construction activities. Several sign projects included Cherry Creek Regional Trail signage at the new Bronco's Parkway Trailhead and Maintenance Program signage at neighborhood projects.



**Southeast Metro Stormwater Authority**

**Stormwater Maintenance**

[semswa.org](http://semswa.org)

## Customer Service

The goal of SEMSWA's Customer Service Program staff is to provide a rapid response to queries regarding stormwater management fees and services. In 2010, 789 calls were received and responded to by staff.

## GIS Program...

During 2010, SEMSWA's GIS (Geographic Information Systems) staff continued several large-scale mapping projects as well as enhancing existing datasets and processes. GIS efforts in 2010 included:

- **Stormwater System Inventory:** SEMSWA staff and interns made considerable progress mapping and field verifying SEMSWA's stormwater infrastructure. To date, nearly 95% of all infrastructure (inlets, pipes, culverts, manholes, etc) have been field verified. This information is useful in asset management, planning, and establishing a *proactive* maintenance program. A notable effort in 2010 involved detailed condition ratings for all Corrugated Metal Pipes (CMP) in SEMSWA's service area.
- **Asset / Work Management System:** GIS staff continued to improve and enhance features and reporting functionality within the Asset and Work Management System (CarteGraph). This system enables SEMSWA to efficiently track projects, permits, plans, reviews, asset inventory and work orders.

Other notable 2010 GIS projects included Impervious Surface and building footprint mapping, accurate stream channel network maps, and improved stormwater basin mapping. Each of these efforts is essential to understanding stormwater flow in urbanized environments.

GIS staff also participated in several multi-jurisdictional coordination tasks with the Denver Regional Council of Governments, Centennial, and Arapahoe County.

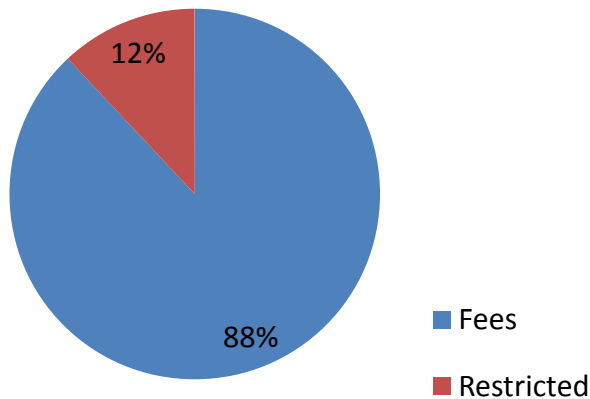
## GIS Inventory to date...

- 915 culverts
- 7,521 inlets
- 4,500 manholes
- 261 miles of pipe
- 2,115 outfalls
- 421 ponds/basins
- 160 miles of channel

## SEMSWA Financials...

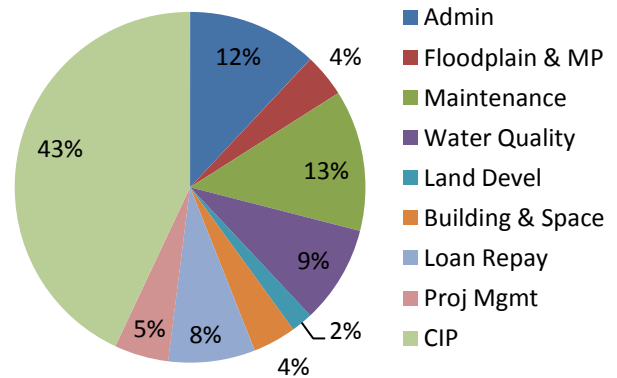
SEMSWA is a political subdivision and a public corporation of the State, falling under the guidelines of Colorado State Statute for a "drainage authority" (29-1-204.2 C.R.S.). This statute allows fee collection for stormwater management services. There are two standard methods of charging for stormwater 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 ensure there are funds available to properly manage stormwater and to meet EPA and State regulatory requirements. The 2010 financials are illustrated below.

### SEMSWA Revenue 2010



Revenues: \$10,380,180

### SEMSWA Expenses 2010



Expenses: \$9,867,558

The Southeast Metro Stormwater Authority (SEMSWA) is an independent governmental entity formed by an Intergovernmental Agreement among City of Centennial, Arapahoe County, East Cherry Creek Valley Water & Sanitation District, Inverness Water & Sanitation District, and Arapahoe County Water & Wastewater Authority to provide stormwater management for the southeast 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 that contributes runoff to the system from a storm event. Funding from these stormwater fees addresses critical needs in planning, constructing, and maintaining stormwater infrastructure, as well as protecting water quality and preserving floodplain. Please contact us for more info @ [www.semswa.org](http://www.semswa.org) or 303-858-8844.