



2015 Annual Report



A Message from the Executive Director



Welcome to our annual reporting of 2015 activities. We try to emphasize those items of most interest to you, our ratepayers, who own property in neighborhoods, commercial districts, and business parks. We hope you find the articles easy-to-

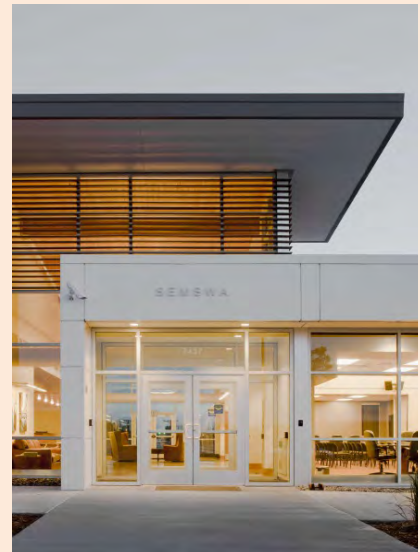
read and informative, with enough detail to provide a snapshot of what our work at SEMSWA entails.

SEMSWA is a unique organization; very few agencies in Colorado are dedicated solely to stormwater management. This singular focus allows the City of Centennial, Arapahoe County, and our special district partners to concentrate on public services they do best, while SEMSWA gives attention to the services essential to stormwater management. This includes managing neighborhood drainage infrastructure, regional collector systems, and community natural resources through flood control, water quality, master planning, construction, and maintenance activities. This singular stormwater emphasis also means that we are in an excellent position to use our collective expertise to further the practice of efficient and effective operations that benefit not only SEMSWA customers, but other neighboring agencies that also manage stormwater.

Awards are one way we can judge the merits of SEMSWA's contribution to our industry as a whole. Receiving an award is essentially getting a 'good review' for our efforts, albeit from our peer group rather than our customers. While we seek out customer service reviews from our ratepayers, submitting our projects for recognition of quality work seems to be a good feedback mechanism to measure success, and we hope it translates into an increased level of customer confidence.

During 2015, SEMSWA was awarded numerous 'positive reviews' by several organizations. Being an agency that constructs projects and maintains infrastructure, the measure of our success is almost always the tangible result in the field after the work is done. But I have found that the benefit in the act of applying for an award is the opportunity to take a look inward and make a solid assessment of the worthiness of our efforts, both in the field and in the office. This appraisal process allows us to see how well we are doing as a public service agency and where we can make improvement and promote better practices. In the end, an analysis of both the process and the end result move us forward. We strive to continue to operate at a high standard, stay relevant, maintain efficiency, and keep our customers satisfied.

John A. McCarty, PE, PWLF



Engineering News Record magazine recognized the SEMSWA Service Center with their Best Government/Public Building award



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.

Maintenance Division

During 2015, maintenance efforts included routine sediment removal from channels and ponds as well as inlet, grate, vault, and culvert cleaning. In addition, maintenance staff continued to focus on pipe inspection efforts, with a dedicated crew tasked with staffing the camera van to generate pipe system video used to update SEMSWA's Asset Management database.

A hidden champion in the stormwater management world is the urban conveyance system on and underneath our traveled roadways. This system of street inlets and pipe does its job mostly unnoticed, routing rain events to the nearest outfall, unless a large summer storm event overwhelms the system and floods the streets. Or, in some cases, unless components of the storm pipe system cause a perceived hazard to vehicles. In the case of deteriorating and broken inlets, sunken manhole covers, and the more serious pipe sinkholes, all ratepayers in the SEMSWA Service Area are directly affected in some manner by these roadway issues. The maintenance crews dedicate many staff hours to these fixes, sometimes cosmetic, but still a very vital part of maintaining a functioning and viable storm sewer system.

Additionally in 2015, the maintenance staff were essential members of the SEMSWA team that developed more streamlined permitting for their sediment removal activities. The goal is to simplify routine maintenance activities that require environmental permitting for time-sensitive work tasks.



Prepping a street inlet for concrete repair work



Putting final touches on concrete replacement



Sinkholes are associated with a void that develops in the vicinity of a storm pipe; in this instance, a pipe that takes storm flows off County Line Road at Chester Street



Vegetation can also impede detention pond function

The Routine Maintenance Program is responsible for inspecting and cleaning stormwater infrastructure so that storm flows are effectively conveyed to and from pipes, culverts, and ponds, and on to the drainageway. 2015 Work Request numbers illustrate the extent of the infrastructure maintained:

- **7,450** inlets, outfalls, grates & vaults cleaned
- **2,400** tons sediment removed
- **175** dump trucks debris, trash and vegetation removed
- **33,000** linear feet storm sewer pipe inspected
- **240** service requests processed



Forebays/channels require routine maintenance, including annual sediment & debris removal





Undersized and deteriorating culvert crossings under Rosemary Way, carrying tributary flows to Willow Creek, required upsizing to safely convey storm event flows

The newest SEMSWA CIP project in the Willow Creek neighborhood is on the **East Tributary to Willow Creek**, specifically replacement of the South Rosemary Way corrugated metal culvert crossings that had deteriorated and were further compromised during a large 2014 summer storm event. The project focused on upsizing the culvert capacity under South Rosemary Way, an important interior roadway connecting two sections of the Willow Creek neighborhood. The project did this by replacing the two failed large metal pipe culverts with a 16-foot by 8-foot concrete box culvert, sized to adequately convey larger storm events, up to the 100-year design flow. The increased conveyance capacity mitigates the potential for a South Rosemary Way road failure and makes roadway passage safer during a larger rain event. Design and construction costs were \$625,000.



Storm System Improvements

2015 was an opportunistic year for CIP, as important pipe and culvert replacement projects took center stage. Due to their poor or damaged condition, the need for increased conveyance, or both, pipe projects are important solutions to maintaining a functioning storm sewer system and solving neighborhood drainage and flooding issues. Two pipe projects completed in 2015, the Geddes Avenue at Clarkson Street and the Vincennes Way at Mineral Avenue locations, took the opportunity to replace damaged pipe, optimize conveyance and allow the storm sewer system to function as designed.

CIP Construction 2015

CIP Projects Completed:

Willow Creek's East Tributary Culvert @ Rosemary Way

Littles Creek @ Geddes Ave Storm Sewer System Improvements

Willow Creek @ Mineral Ave & Vincennes Way Storm Sewer Replacement

CIP Projects In Progress:

Littles Creek @ Broadway Storm Sewer Improvements

Little Dry Creek @ Yosemite Channel Improvements

Cottonwood Creek @ Inverness Regional Pond Improvements

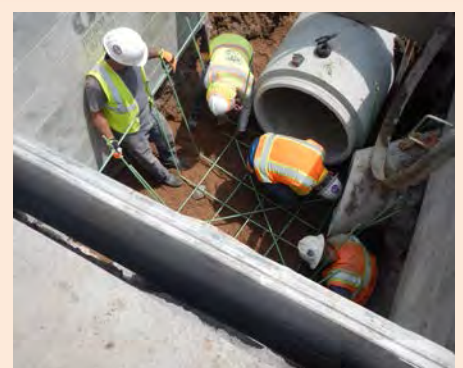
Piney Creek @ Tower, Phase I Channel Reclamation Permitting



Completed South Rosemary Way Culvert Crossing



Damaged pipe at Mineral Ave/Vincennes Way



Constructing Geddes Ave/Clarkson St pipe repair

Land Development Program staff were busy in 2015 responding to a significant number of new development applications. The real estate and development recovery is still evident in our service area with **117** new review cases in 2015. Another sign of continued growth is the record number of pre-submittal meetings staff prepared for and attended: **151** pre-submittal meetings in 2015, up from 135 in 2014, and 105 in 2013. Project submittals from an applicant typically include drainage reports, construction documents, and various permit applications reviewed for adherence to criteria. Staff also review SEMSWA capital construction projects as well as City and County Public Works projects for adherence to standards, as part of the goal of ensuring responsible and resilient development of public infrastructure. Staff coordinate their reviews with Floodplain Management and Water Quality program staff to identify permitting requirements and discuss the technical merit of variances to the standards. This coordination provides the applicant the smoothest path through the development process.

In 2015, the Land Development staff were excited to coordinate the final approvals for several high-profile commercial developments projects in the Centennial Airport/Dove Valley Business Park area. These included Top Golf, Children's Learning Adventure, and Man Caves. This developing south-metro area, within both the City and County jurisdictions, is continuing to see an influx of interesting and substantial developments that make this a vibrant destination for both residences and businesses. The regional stormwater system in this area includes both detention and water quality, maximizing the developable footprint for the owner/developer.



Completed development projects during 2015, including Top Golf in Centennial (left), Man Caves in Arapahoe County (middle), and the Children's Learning Adventure in Centennial (right)

Master Planning Program

Master Plans, completed in partnership with Urban Drainage and Flood Control District (UDFCD), are used to guide responsible development and identify future capital construction projects. This is accomplished through the delineation of flood hazard areas, identification of regional drainage and stormwater quality improvement opportunities, and recommendations for prioritizing efforts. Master planning for a basin may include several components, including major drainageway planning, outfall systems planning, and a flood hazard study, and it may take up to three years to fully complete the planning effort. During 2015, eight basins, including **Lee Gulch, Westerley Creek, Harvard Gulch, Big Dry Creek, First Creek, Sand Creek**, and two transportation corridors in urban unincorporated Arapahoe County, including Iliff Avenue and Coal Mine Road, were studied. The following documents were completed in 2015:

- ✓ Big Dry Creek, Major Drainageway Plan (MDP)
- ✓ Westerley Creek, MDP
- ✓ Iliff Avenue Outfall Systems Plan Addendum
- ✓ Coal Mine Road Alternative Study

Also during 2015, master planning efforts commenced or were continued for the following components in the studied basins:

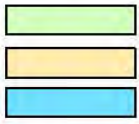
- ✓ Big Dry Creek, FHAD study
- ✓ South Platte, FHAD study
- ✓ Sand Creek Right Bank Tributaries MDP
- ✓ Harvard Gulch, MDP and FHAD study
- ✓ First Creek, Outfall Systems Plan (OSP)
- ✓ Lee Gulch, Alternatives Study



Big Dry Creek channel and bank instability identified in the master plan; this will eventually be addressed with a SEMSWA capital construction project

SEMSWA CIP Projects 2015

Completed
Under Construction
In Design



Iliff Rd Storm Sewer
Coordination (County Project)



Mesa Park Tract B
Channel Improvements

East Toll Gate Creek
Regional Pond Improvements

Caley West Regional Pond
Pond Improvements

Inverness Regional Pond
Pond Improvements

Little Dry Creek (Xanthia to Yosemite)
Channel and Culvert Improvements

Little Dry Creek @ Arapahoe Rd
Channel Stabilization

Littles Creek @ Broadway
Storm Sewer Improvements

Littles Creek @ Geddes
Storm Sewer Improvements

Dry Creek Rd @ Adams
Storm Sewer Improvements

Willow Creek East Tributary @ Rosemary St
Culvert Replacement



Willow Creek @ Mineral / Vincennes
Storm Sewer Replacement

Piney Creek @ Tower Rd - Phase 1
Channel Restoration

Piney Creek Ranches - Phase 2
Stream Stabilization

Piney Creek Ranches - Phase 1
Stream Stabilization

Piney Creek Reach 7
Stream Stabilization

Piney Creek U/S of Caley
Stream Stabilization

Cherry Creek Reach 2
Stream Stabilization

2015 marked a busy year of Floodplain Management program staff interaction with SEMSWA's Capital Improvement Program. These discussions of important floodplain considerations assist with an understanding of the potential need for a floodplain modification study, extent of modeling, and floodplain and environmental permitting requirements. They also foster an improved collective understanding of any floodplain issues and impacts to property owners.

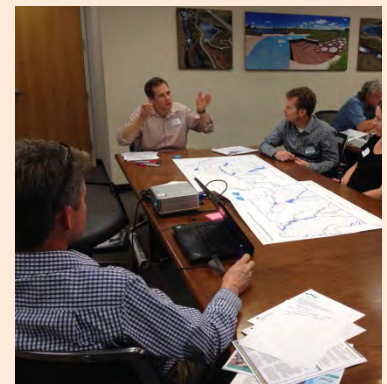
All CIP stream improvement projects have the potential to impact the floodplain. Even though there is "no rise" in flood elevations, the very nature of a channel improvement project means that while the floodplain limit still defines the required flood carrying capacity, channel cross sections have been altered. During 2015, the Floodplain Program staff assisted CIP during the floodplain permitting process review of two Cottonwood Creek projects, three Piney Creek projects through the Farm and Ranches developments, and the Antelope Creek box culvert crossing project. The staff assisted in assessing the floodplain impacts, reviewing floodplain modification studies, coordinating the Federal Emergency Management Agency (FEMA) map revision process, highlighting any flood insurance ramifications for existing residential structures in the vicinity of the stream improvement projects, and ensuring successful submittal of any Letters of Map Revision to FEMA.

Floodplain Program Statistics

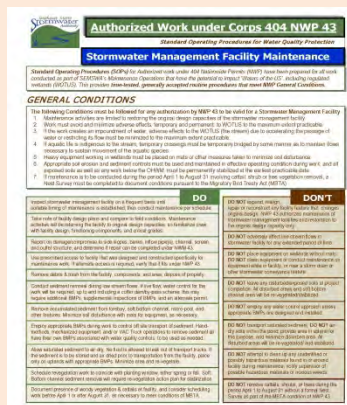
During 2015, 20 floodplain permits were reviewed, approved, and issued for work in a floodplain, 60 floodplain studies were assessed for impacts from proposed work, and six requests for modification to a floodplain were reviewed. SEMSWA also provides a map information service and responded to many inquiries requesting assistance in defining floodplain limits on a parcel and what that means to the property owner. Outreach efforts were significant in 2015 and included newsletter articles and mailings, local newspaper articles, and direct mailings with important flood risk information that reached over 40,000 residents.

Floodplain Program Items of Interest

During 2015, staff participated in the formation of the Denver Metro **Program for Public Information (PPI)** Committee on behalf of the City. This is part of FEMA's Community Rating System (CRS) to promote targeted and consistent flood safety messaging. The Urban Drainage and Flood Control District (UDFCD) sponsored and facilitated the PPI Committee comprised of seven local governments. A draft PPI Document is being vetted for eventual local adoption by the participating communities.



Also in 2015, SEMSWA/FEMA staff finalized the **CRS 5-year cycle verification** that improved both the City and County to a Class 7, with a 15% flood insurance discount for special flood hazard area properties that went into effect in October 2015. Both the City and County were recognized by FEMA with a plaque for achieving a "best of the best" community rating. In addition, the **Physical Map Revision (PMR)** process that submitted UDFCD's Flood Hazard Area Delineation studies for Piney, Antelope, First, Willow, Cottonwood, and East Toll Gate creeks for map revision, was ongoing. The new maps are anticipated to become effective Fall 2016.



Example SOP for Corps Permitting efforts

Floodplain Development Permitting and US Army Corps 404 Permits

During 2015, the Floodplain Management staff assisted with a comprehensive look at the US Army Corps of Engineers (Corps) environmental permitting process for projects impacting floodplains. The purpose is to streamline the origination of SEMSWA maintenance projects and to implement emergency or out-of-sequence projects, within regulatory guidelines and with good engineering practices. The City and County Floodplain Codes and Ordinances, and FEMA, require that all necessary environmental permits have been obtained from agencies that approve disturbance in the floodplain prior to issuance of the Floodplain Development Permit. This comprehensive review assisted in the development of Standard Operating Procedure (SOP) documents that meet Nationwide Permit General Conditions and simplify internal efforts to generate more rapid floodplain permit submittals and environmental permit approvals for SEMSWA projects.

During 2015, the State issued a 2nd draft of Colorado's General Permit for Municipal Separate Storm Sewer Systems (MS4), and the existing permit was again administratively continued. SEMSWA, along with the other designated MS4 communities and interested parties, provided comments in June. The new permit is expected to be issued in Spring 2016.

In 2015, SEMSWA met the MS4 permit requirements to reduce pollutants in stormwater runoff from residential, commercial, and industrial areas through permitting and inspecting sediment controls at over **150** construction sites; ensuring the proper construction of **10** water quality treatment facilities for new development; resolving **28** illicit discharge reports from the public; and sponsoring the safe disposal of **68,000** pounds of household hazardous waste collected via the 'At Your Door Special Collections' from over **640** City and County households.



Investigating fluid spills from commercial waste receptacles requiring cleanup and abatement

Public Outreach

In 2015, SEMSWA participated in or sponsored over **50** events that provided an opportunity for the public to learn about water quality protection and what they could do to prevent negative impacts to our creeks and greenways. The goal of this outreach is to foster partnerships between SEMSWA and residents/businesses through education and shared natural resource values. SEMSWA-sponsored outreach events reached thousands of citizens via a combination of public meetings, festivals, classroom & field projects, field tours/workshops, and HOA/volunteer events. SEMSWA believes that these events strengthen the connection between people and their watershed, and reinforces that everyone has a role in protecting a stream's water quality. Also in 2015, over **60,000** residents received utility/newsletter mailings.

SDA Collaboration Award

SEMSWA has worked since 2007 with the South Suburban Park and Recreation District (SSPRD) and the Arapahoe Park and Recreation District (APRD) to identify opportunities for water quality permitting collaboration. This collaboration was recognized in 2015 with the **Special Districts Association Collaboration Award**. In early 2012, SEMSWA instituted a new permitting approach to streamline the Districts' permit submittals with an Annual Permit process for construction site controls, and eliminating some permitting requirements. The key to simplifying the regulatory requirements for Districts is to use innovative/tailored best management practices specific to the greenway/park conditions that protect water quality in their drainageways. Through the implementation of a variety of new permitting processes, establishing site-specific controls, and identifying routine maintenance activities that did not require permitting, SEMSWA was able to save both of the Districts time, effort, and money with reduced or eliminated submittals.



District Annual Permit Fact Sheet



SEMSWA Board Member Stephanie Piko and Executive Director John McCarty accept SDA Award



During 2015, SEMSWA sponsored & participated in the Denver Regional Science Fair, the Cherry Creek Watershed Relay Race, and the City's Public Works Week.

Project Awards



The CIP project incorporated stream crossings



The Creekside Quest 's Settlers Homestead Cabin, stream bed, and teepees allow imaginative play



CASFM Grand Award for Eco Park Stream Improvements

At its 2015 Annual Conference, the Colorado Association of Stormwater and Floodplain Managers (CASFM) honored SEMSWA and its project partners with its Grand Award for Engineering Excellence for the **Cherry Creek Stream Reclamation at the Cherry Creek Valley Ecological Park** project. Urbanization and the resulting increase in storm runoff took a toll on the Park's natural systems, leading to stream erosion, loss of vegetation, degraded water quality, and infrastructure damage. This CIP project, with major funding partners Urban Drainage & Flood Control District, Cherry Creek Basin Water Quality Authority, and Arapahoe County, provides a stable stream corridor by raising the channel with a series of natural-looking grade control structures.

A **Creekside Quest** natural playscape area is a highlight of the stream reclamation project, designed to be a safe place for children to explore and create, while being introduced to an important theme about water in both an historical and a present-day setting. Moving through the Creekside Quest is quite fascinating, starting with the trail loop leading to a sleeping buffalo herd. The small earthen mounds shaped in the form of sleeping buffalo are seeded with long and short grasses to mimic a buffalo's hide and are of the size that would be safe to climb. A dry streambed cuts through the space representing that the buffalo, Native Americans, and settlers were drawn to areas that were associated with water for survival, in essence a 'ribbon of life in a dry land'. As a child continues along the path, there are areas where poles on the ground can be made into teepees, along with the remnant logs of a settler's homestead, encouraging a fun and physical change of pace. These interactive areas continue the theme of a stream's 'ribbon of life' as homesteads were forged. It's a special place to play, right in the middle of dense housing development and nearby businesses, and an award-winning example of an engineered solution that incorporates education and community benefits.

APWA Environmental Award for Walnut Hills Neighborhood Stormwater Improvements

At the American Public Works Association's 2015 Annual Conference, recognition was awarded to SEMSWA's **Walnut Hills CIP project** that improves a major neighborhood stormwater conveyance system. The Walnut Hills and Hunters Hill subdivisions, located north of Dry Creek Road and West of Yosemite Ave in Centennial, have experienced extensive street flooding during larger storm events due to inadequate capacity in the under-sized storm sewer system. SEMSWA utilized drainage easements on nine parcels, received new easements from 11 property owners, and built relationships with the 20 property owners to complete a project that illustrates a critical connection between transportation and drainage within a neighborhood and the surrounding area.



Previously, large rain events flooded streets



Contractors worked in back yards to install pipe

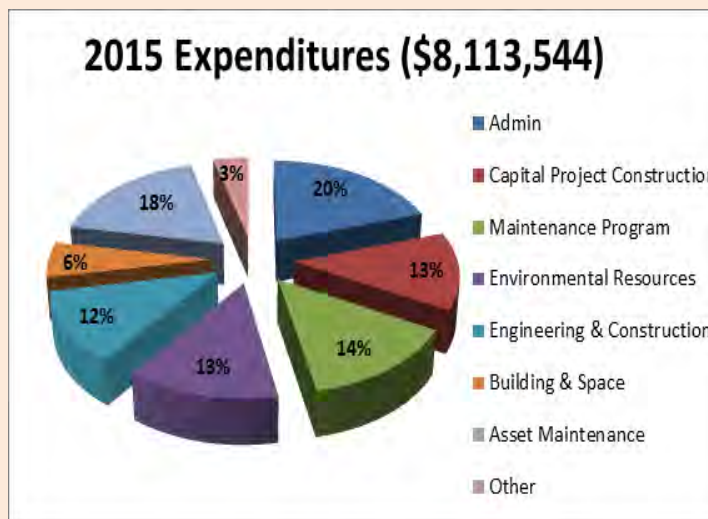


The neighborhood welcomed the project fix

SEMSWA is a political subdivision and a public corporation of the State, formed pursuant to Secion 29-1-204.2 of the Colorado Revised Statutes. SEMSWA is an enterprise activity that is financed by fees based on the amount of runoff each property contributes to the storm sewer system, calculated from the amount of impervious area (e.g. roof, driveway, parking lot) and density.

SEMSWA's purpose is to plan, fund, construct, and maintain drainage and flood control facilities within the service area. The SEMSWA Board has set fees to provide sufficient funds to properly manage stormwater runoff, protect water quality, and meet State and Federal regulatory requirements. Property owners can find more information about the fee calculations at www.semswa.org.

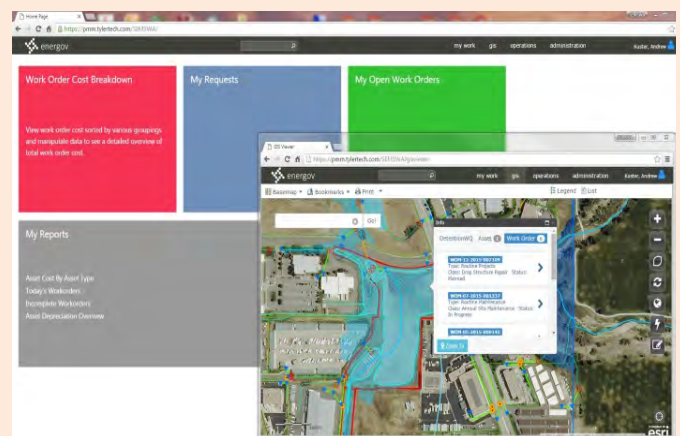
The charts below show 2015 Revenue and Expenditure percentages. All program area expenses for 2015 were typical for any given year, with the exception of Capital Project Construction which can vary significantly from year to year depending on design and construction schedules.



GIS/IT Solutions

During 2015, the Geographic Information System (GIS) / Information Technology (IT) Solutions group conducted routine updates and enhancements to SEMSWA's spatial databases and related systems. These efforts included the annual impervious updates, stormwater infrastructure database updates, stream inventory and photography, sign "asset" creation, floodplain layer improvements, and permanent water quality BMP tracking improvements. Near the end of 2015, the GIS group began consolidation of its massive pipeline video (CCTV) database to facilitate easier retrieval of stormwater video inspections.

The highlighted GIS/IT effort of 2015 was the implementation of the **Energov Land Management (LM)** and **Public Maintenance Management (PMM)** software system used for plan review, permitting, fee tracking, inspections, contact management, work requests, work orders, and stormwater assets. SEMSWA went "live" with this web-based system in March 2015 and has since been working on optimization, 'work flow' configurations tailored to SEMSWA, City and County business processes, data development, and cross training. The GIS/IT staff is currently working on a web-based Customer Portal to the Energov system that will provide customers information regarding their stormwater related projects and requests.



Screenshot of PMM software for Maintenance Work Order generation



One of SEMSWA's most awe-inspiring outreach events, the annual 50-mile Cherry Creek "Run for the Watershed" race; photos provided by Susan Brown, Valerian Ilc

SEMSWA 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. SEMSWA, 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 2015 Board Members, Representation, and Contact Information

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This Annual Report is an informal compilation of activities to highlight SEMSWA program accomplishments, and record them in a single narrative document to provide a continuing history of our program area achievements.