



CITY OF COLORADO SPRINGS



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# Stormwater Events

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## Flood Risks

### Flood Risks in Colorado Springs

Although many people believe that they are not in danger of flooding if they do not live or work near a stream or creek, nothing could be further from the truth. As the recent rain and flood events in September illustrated, debris-clogged drainage inlets and large amounts of stormwater runoff can cause inland flooding in areas that aren't necessarily adjacent to a stream or creek. Flooding can occur in low-lying, depressed areas that are not shown on any flood maps, and can be very difficult to predict. Storm sewers can become overwhelmed, hail and debris can partially or completely clog inlets, and flat or low-lying areas may not have the drainage infrastructure required to handle significant runoff.

***Causes for flooding vary widely, and every part of Colorado is at risk. Some causes, such as thunderstorms and snowmelt, are obvious, but many are not. Be prepared to encounter flooding anywhere and at anytime!***

Colorado Springs' flash flood season, which is historically April through October, includes both snowmelt and thunderstorm flooding. As temperatures increase with the arrival of Spring, the high mountain snowpack melts and runs off, filling the streams and creeks and sometimes causing minor flooding issues. Thunderstorm flash flooding is caused by intense rainfall over relatively small, localized areas. The term "flash flood" is used to describe flood events caused by convective thunderstorms because little or no warning is provided. Be aware that an area downstream of a thunderstorm event can experience a flash flood even though it may not be raining. The average number of thunderstorm days in Colorado Springs is between 70 and 80.

***Between 20 and 30 large flood events occur somewhere in Colorado every year, and Colorado experiences a major flash flood disaster approximately once every five years. Because of damage to vegetation from the Waldo Canyon Fire in 2012, the risk of flash flooding has increased exponentially and will be an issue of concern for many years to come.***

### Safety Tips for Driving during Heavy Rain Events

Statistically, the majority of injuries and deaths occur during flood events because people attempt to drive through floodwaters that are too deep.

-Turn Around! Don't Drown! One foot of water will float many vehicles; if you're in doubt about the water's depth, turn around and find an alternate route. Six inches of water will reach the bottom of most passenger vehicles; loss of control or stalling is possible.

-If your vehicle is caught in flood water, remain calm and call 9-1-1. Debris-filled water, which can be found downstream of the Waldo Canyon Burn Scar, can create an environment that may be safer to stay in the vehicle than to flee. In areas with water that contains little to no debris, passengers should prepare to exit the vehicle if the situation warrants. Because each scenario is unique and the best action may vary, the best solution is to avoid flooded and low-lying areas. If you can't see the lines on the road, don't drive through it.

### Safety Tips for Pedestrian and Bicycle Travel

-Seek Higher Ground! Never seek shelter near a stream or creek, or under a roadway bridge or culvert; the creek may be conveying floodwaters from a thunderstorm event that occurred miles away.

-Ideally, avoid walking or biking near streams, creeks, or low-lying areas during or following a severe storm event, even on designated urban pedestrian/bike trails. Flash floods can occur quickly and without notice.

-As little as six inches of moving water can cause a person to slip and fall. For more information, go to [www.springsgov.com](http://www.springsgov.com) ditches **And Ditch Playing in Ditches!**

# VOLUNTEER

## Adopt-A-Waterway

Now in its 6th year, the City's Adopt-A-Waterway Program continues to grow. To date, 15 different groups have participated in cleanups in 2013. All together, we now have 31 different adopting groups in the program. If you or your organization is interested in participating, please contact Jeff Besse at 719-385-5566.



## Storm Drain Marking

The city's Storm Drain Marking Program continues to be a successful volunteer option. Annually, over 10 different groups (200 citizens) participate in the program and collectively mark roughly 350 storm drains in our city. If you or your organization is interested in participating, please contact Jeff Besse at 719-385-5566.



## Templeton Gap Levee Accreditation/Floodplain Maps

As has been reported previously, the Templeton Gap Levee has been under evaluation to provide FEMA with certification documentation. The documentation will confirm to FEMA that the levee can perform as intended and contain a 100-year flood safely. Without this certification FEMA floodplain maps could extend downstream of the levee showing many adjacent properties at risk of flooding. This could potentially require many property owners to acquire flood insurance. With certification the floodplain maps would show flooding confined by the levee and downstream properties would not be required to acquire flood insurance.



However, during the nation wide effort to certify levees questions were raised about FEMA rules being applied for the technical evaluation of levees. This evaluation of the rules has delayed a decision on the Templeton Gap levee accreditation and the resulting floodplain. Therefore, the City was informed that the floodplain associated with the Templeton Gap Levee will not be revised with the other floodplains in El Paso County. This means that, for now, the current floodplain maps associated with the Templeton Gap Levee will remain in effect and the relationship of downstream properties to the floodplain maps should not be effected. However, once FEMA resolves the technical issues about how to apply the new rules, revised maps may be published. What those new maps will show will again depend on the status of the levee's certification.

## The Summer of Stickers

As a college kid attempting to obtain a decent job straight out of college, there are only a few things that I can do to make sure that happens. I can get good grades and be a part of a group/team, but perhaps the best way to secure that job is to show my work experience and how I interact with a team of professionals.

The first two weeks of this internship was solely placing fish stickers on storm drains in an attempt to decrease the amount of pollution being dumped into the storm water sewage system. At the end of that second week, the summer seemed to be crawling by and the overwhelming thought of “no more” took over in the mind. Thankfully, Jeremy Carlston was also hired and I had a colleague with whom to share a growing dislike for sticker fish. By the time the presentations started in June, those seemingly infinite places to put stickers had shrunk but my relationship with the office staff had done the exact opposite.

I was interned under Jeff Besse for the Stormwater Education Program due to my five years of teaching children and adults how to swim. Teaching young men and women about being safe when it rains, as well as about the dangers of pollution, was by far one of the most enjoyable things about this internship. The most enjoyable experience about this internship, however, was getting to know everyone in the office and developing a relationship with them. Being tutored by Jeff, Elizabeth Nijkamp, Patrick Morris, Joel Mackey, and Ben Sheets allowed me to gain an insight into a number of different technical areas that will help me in my journey to become an engineer. Elizabeth took time from her busy schedule to teach Jeremy and me about reviewing grading and erosion control plans. Patrick showed the two of us about being an inspector, going out to different sites and describing what to look for, and where to look for it. Joel took us out and let us take GPS points of various drainage and how to transfer that information into GIS. Ben let us work on one of the most technical projects I’ve had the pleasure to work on through the joy of HEC-RAS.

By doing these various tasks around the office, as well as shadowing around Elizabeth to engineering meetings, I felt a part of this system of bettering the city and attending to the needs of the population. This internship illustrated the life of an engineer and solidified my choice in pursuing that degree. That choice was based off not only what I can succeed at, but also because of the types of people I’ve met at the City of Colorado Springs. I hope to return next summer to the same position.



## Summer Internships

Nowadays internships have almost moved from “optional, but good” to “mandatory” if one wishes to succeed in his or her career. With that in mind, I feel very fortunate for the opportunity to have interned for the Colorado Springs Engineering Review and Stormwater Department. I graduated with a Bachelor of Science in Civil Engineering in May, and with plans to attend graduate school in the fall, I saw this summer as a great chance to gain some of the coveted “real-world” experience. Try as they may, institutions of higher learning cannot teach very much of what occurs outside of the classroom walls. There simply is no substitute for hands-on, in-person experience.

Eleven weeks may seem like a short period of time, but a lot can be learned in less than 3 months. One of my primary tasks over the summer was to work with Joe Bauer, another intern, to obtain a hydraulic analysis of Spring Creek just north of Fountain Boulevard and Chelton Road for use in a preliminary cost estimation. Due to the amount of water expected to flow through Spring Creek from a 100-year storm (a storm that has a 1% chance of occurring in any given year), it is proposed that the 4 undersized box culverts that Chelton Road passes over be replaced with a simple span bridge to prevent flooding. Using HEC-RAS software developed by the Army Corps of Engineers, we succeeded in producing meaningful data for review by the Capital Improvements Projects Team. I am very appreciative of hydraulic engineer Ben Sheets for helping us out and overseeing the project.

Another valuable insight I gained from my short stay was the review process the City uses to ensure regulations pertaining to stormwater management are met. As the economy recovers, more and more companies seek to resume construction. Although they are not directly profitable to these companies, best-management practices (BMPs) are vital to our environment, economy, and our overall well being to protect stormwater that ultimately ends up in our rivers, lakes, reservoirs, and other bodies of water all around us. Both temporary and permanent BMPs, which prevent erosion and pollution, must be installed during the construction process. I was fortunate enough to review and observe first-hand the planning and implementation of these BMPs as well as other important aspects of construction. This knowledge will certainly be of use to me when I one day work as an engineer to help design various projects. I'd like to thank review engineers Patrick Morris, Elizabeth Nijkamp, and Lydia Maring for taking time out of their busy schedules to work with us on this.

As most are already aware, the west side of Colorado Springs was hit with a devastating fire last summer, known as the Waldo Canyon Fire. Citizens living in the neighborhoods affected by this fire now have to deal with flooding and erosion that will occur as a result. As much of a problem as this is, the southwest portion of the city, near the Broadmoor and Cheyenne Mountain, is still susceptible to destructive wildfires that could produce equally severe flooding and erosion. In an effort to be proactive, Tim Mitros worked with Joe and I to locate drainage paths and other waterways entering the city in that area. If a fire should ever occur there, Tim and other members of the Stormwater Team can use our findings to help develop solutions to this flooding and erosion. Thank you to Tim for allowing us the opportunity to work on this assignment and to sit in on various meetings to see what managers deal with on a daily basis.

Aside from all this, I also helped Joe Bauer with the Stormwater Education Outreach Program. Thanks to Jeff Besse, Stormwater Specialist and Education Outreach Coordinator, we were able to teach children about the dangers of flash flooding. We also used an EnviroScape model to show youth in the city how polluting can negatively affect water quality and what we all can do to prevent this. With whatever time was left, we used stickers to mark storm drain inlets with a fish saying “No dumping, drains to Fountain Creek”. We also came up with a rough draft of a brochure to educate carpet cleaners, painters, and other similar workers on what happens when they dump their waste into storm drains. Hopefully, citizens will learn that stormwater does not get treated as wastewater that comes from within homes does, and that dumping pollution into the drains destroys the quality of the environment we live in. Again, thanks to Jeff Besse for assistance with all these tasks.

Finally, I'd like to thank anybody else that made this internship what it was. Joel Mackey, Bob Pisciotta, and Rich Kotwica all familiarized us on GPS technology and its applications. Steve Kuehster introduced us to various people in the industry who talked to us about possible career paths and opportunities. Jason Fields and Alan Williamson assisted us with maps for the projects we worked on and Andy Richter made sure we had the necessary software programs. Everybody else around the office was extremely friendly and amiable. You've all been great!

## Guest Article: From the Floodplain Office

The National Association of State Floodplain Managers has 29 active chapters with another 10 pending. At the state level most of those active chapters are listed as associations of floodplain and stormwater managers. This is true of the Colorado chapter because in Colorado we recognize that management of stormwater and floodplains are inextricably intertwined.

The floodplain is where the stormwater ends up and how it gets there is critically important. Floodplain Management takes place at the Pikes Peak Regional Building Department (RBD) and stormwater management is regulated by of the City of Colorado Springs. These two entities have a productive working relationship and are in close communication. Both are involved in strategic long-range planning for the Fountain Creek Watershed with a goal of protecting the floodplains, and in doing so to create a safe and sustainable ecology for the citizens of Colorado Springs and the surrounding area.

Although the rain may not come often in Colorado Springs, when it does it can come with speed and intensity. This makes us prone to flash flood events, which have historically been very damaging. It's important to remember that flooding of this type is not always restricted to the floodplains. Heavy rains can produce street flooding and in severe events can cause floodwater to enter structures causing substantial damage.

Typical homeowners insurance does not cover flood events. Flood insurance for structures not in the Special Flood Hazard Area can be obtained at very reasonable rates. For more information on the National Flood Insurance Program you can go to <http://www.pprbd.org/>, the website of the Regional Building Department. Click on "Floodplain" and you will find links to FEMA and FEMA flood maps as well as a wealth of information on flood related issues. You can check on the website whether your property is in a floodplain.

Regional Building Department is available for technical advice or assistance for flood related issues to property owners on an individual basis. Elevation Certificates for many addresses are on file at RBD. If you still have more questions feel free to call Floodplain Management at 719-327-2938.

The Floodplain Management Staff are committed to doing their best to keep you safe and dry.

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“Stormwater Events” is published by the Stormwater Engineering Team. For additional information, please call Jeff Besse at 385-5566

Our Vision

Provide Stormwater programs, services and support with integrity and professionalism through active partnership and involvement with the community

Our Mission

Enhance the quality of life and the viability of our community by providing and supporting Stormwater programs and service that responds to local concerns and community expectations, and promote public safety, stream health and water quality

## Stormwater BMP O&M Update

June of 2013 marks the fifth year of the City Stormwater BMP Operation and Maintenance program. As of today, there are 87 developments in our program with a total of 127 BMPs that the City is required to track to ensure that they are being maintained and functioning correctly.

Porous Landscape Detention, also known as a Rain Garden leads the list of BMP types with 59 in our program. Next are Extended Detention Basins with 35, followed by Sand Filter Detention Basin with 17, proprietary BMP's make up 10 and the rest of the BMPs are a mix of Grass Swells, Modular Porous Block and Retention ponds. This year, 34 BMP owners were required to submit the Annual Inspection report for their BMPs and one compliance inspection was performed by the City.

The biggest concern for the City O&M program is completion of the Maintenance Agreement between the City and the private BMP owner. To date, the City has not been able to finalize the agreement for 16 sites that have completed development activities. This requires a City inspector to visit the sites every 90 days to ensure the BMP is being maintained and functioning correctly.



## Stormwater Classes

### Grading and Erosion Control Class—November 12, 2013

**8:00 AM-5:00 PM City Administration Building, 30 S Nevada Ave., Suite 102**

Most land disturbing activities in Colorado Springs require that grading, erosion and stormwater quality control plans be developed and submitted to the City. This class information summarizes the requirements for grading, erosion and stormwater quality control plans and the submittal and review process. Also included is a description of the process for addressing non-compliance.

### Developing & Implementing Stormwater Plans— November 13, 2013

**8:00 AM-5:00 PM City Administration Building, 30 S Nevada Ave., Suite 102**

This full day training program is designed to provide information about how to prepare and implement Stormwater Management plans to help comply with the requirements of the CDPS Stormwater Construction permit as issued by the Colorado Department of Public Health and Environment (CDPHE), Water Quality Control Division (WQCD).

### Operations and Maintenance of Stormwater BMPs— November 14, 2013

**1:00 PM-3:30 PM City Administration Building, 30 S Nevada Ave., Suite 102**

The class is designed for personnel responsible for ensuring the proper functioning of permanent stormwater structures, features, and BMPs as they relate to City requirements and the MS4 permit.

Contact Cheryl Callahan at 719-385-5543 or ccallahan@springsgov.com to sign up for these classes.

