8. Point Source Dischargers

8.1. Overview

Within the portions of Park and Teller counties in the South Platte Headwaters and Upper South Platte, there are currently six major (> 0.05 mgd) discharging wastewater treatment facilities described in Table 8.2. Service area boundaries are only shown for major facilities. Table 8.3 lists the minor discharging facilities (< 0.05 mgd) and Table 8.4 lists the only industrial discharging facility.

8.2. Table: South Platte and Upper South Platte Discharge Locations Major Facilities (> 0.05 mgd)

<table>
<thead>
<tr>
<th>Discharge</th>
<th>Permit No.</th>
<th>Location</th>
<th>Mgmt Area</th>
<th>Design Capacity (mgd)</th>
<th>Existing Load (mgd)</th>
<th>Permit Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Alma</td>
<td>CO-0035769</td>
<td>Middle Fork of the South Platte River</td>
<td>Park</td>
<td>0.117</td>
<td>0.041</td>
<td>10/31/2023</td>
</tr>
<tr>
<td>Fairplay Sanitation District</td>
<td>CO-0040088</td>
<td>Middle Fork of the South Platte River</td>
<td>Park</td>
<td>0.3</td>
<td>0.1</td>
<td>06/30/2020</td>
</tr>
<tr>
<td>Florissant Water and Sanitation District</td>
<td>CO-0041416</td>
<td>Twin Creek, 0.25 mile west of Florissant along Highway 24</td>
<td>Teller</td>
<td>0.057</td>
<td>0.020</td>
<td>03/31/2019*</td>
</tr>
<tr>
<td>Bailey Water and Sanitation District</td>
<td>CO-0020605</td>
<td>North Fork of South Platte River</td>
<td>Park</td>
<td>0.075</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Will-O-Wisp</td>
<td>CO-0041521</td>
<td>Wisp Creek</td>
<td>Park</td>
<td>0.06</td>
<td>0.025</td>
<td>4/1/2022</td>
</tr>
<tr>
<td>City of Woodland Park</td>
<td>CO-0043214</td>
<td>Trout Creek, west of treatment facility</td>
<td>Teller</td>
<td>0.893</td>
<td>0.59</td>
<td>8/31/2020</td>
</tr>
</tbody>
</table>

*Colorado Department of Public Health and Environment Environmental Records search yielded no newer permit/certification
### 8.3. Table: South Platte and Upper South Platte Discharge Locations Minor Facilities (< 0.05 mgd)

<table>
<thead>
<tr>
<th>Wastewater Treatment Plant</th>
<th>Permit No.</th>
<th>Permit Expiration Date</th>
<th>Discharge Location</th>
<th>Mgmt. Area</th>
<th>Design Capacity (mgd)</th>
<th>Existing Load (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer Creek Metropolitan District</td>
<td>(Site app approved 12/21/2005)</td>
<td></td>
<td>Deer Creek (trib. of the North Fork of SP River)</td>
<td>Park</td>
<td>0.012</td>
<td>Data not available</td>
</tr>
<tr>
<td>Camp Santa Maria</td>
<td>Cox-660040 (exp 10/31/2010)</td>
<td></td>
<td>Discharge to groundwater from lagoons</td>
<td>Park</td>
<td>Data not available</td>
<td>Data not available</td>
</tr>
<tr>
<td>Quaker Ridge Camp</td>
<td>CO-0044199 (Permit exp date 8/31/2009)</td>
<td></td>
<td>Discharge to groundwater via soil absorption field</td>
<td>Teller</td>
<td>0.011</td>
<td>Data not available*</td>
</tr>
<tr>
<td>Camp Shady Brook</td>
<td>CO-0045993</td>
<td></td>
<td>Discharge to groundwater</td>
<td>Teller</td>
<td>Data not available</td>
<td>Data not available</td>
</tr>
<tr>
<td>Lost Valley Ranch</td>
<td>CO-0046710</td>
<td></td>
<td>Discharge to groundwater</td>
<td>Park</td>
<td>Data not available</td>
<td>Data not available</td>
</tr>
<tr>
<td>Camp Alexander – Boy Scouts of America</td>
<td>COG-588036 (Permit exp date 5/31/2010)</td>
<td></td>
<td>South Platte River (Segment 1a)</td>
<td>Teller</td>
<td>0.012</td>
<td>Data not available</td>
</tr>
<tr>
<td>Platte Canyon School District¹</td>
<td>COG-588108 (Site app approved 6/30/2007)</td>
<td></td>
<td>North Fork of the South Platte River</td>
<td>Teller</td>
<td>0.019</td>
<td>Data not available</td>
</tr>
<tr>
<td>Teller County Wastewater Utility</td>
<td>CO-0044211 (Permit exp date 3/30/2012)</td>
<td></td>
<td>Rule Creek</td>
<td>Teller</td>
<td>0.035</td>
<td>0.033</td>
</tr>
</tbody>
</table>

### 8.4. Table: South Platte and Upper South Platte Discharge Locations Industrial Facilities

<table>
<thead>
<tr>
<th>Waste Water Treatment Plant</th>
<th>Permit No.</th>
<th>Permit Expiration Date</th>
<th>Discharge Location</th>
<th>Location</th>
<th>Facility Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>London Mine LLC</td>
<td>CO-0038334, new permit filed 9/2018</td>
<td></td>
<td>South Mosquito Creek</td>
<td>Park</td>
<td>Hardrock Mining: Mine Dewatering</td>
</tr>
</tbody>
</table>
8.5. Future Needs Assessment

There has been no recent expansion of wastewater treatment plants, and no future upgrades are expected to meet the population growth in Alma and Bailey. Fairplay Sanitation District built a new wastewater treatment plant which became fully operational in 2009. The Town of Alma is actively pursuing upgrades to their WWTP and is currently working on a feasibility study. Florissant Water and Sanitation District is researching process upgrades to meet effluent ammonia requirements. Bailey is expecting to meet the needs through 2045 and is working on plans to improve sludge handling capabilities and control of the treatment process. Presently Will-O-Wisp is designed for a much larger flow than is currently produced (about 20% of capacity). Anticipated population growth and piping surplus wastewater from neighboring Pine Junction in Jefferson County will hopefully augment Will-O-Wisp’s flow. The City of Woodland Park expanded their wastewater treatment plant on June 30, 2018 to better serve the population.

Continued growth is expected in unincorporated areas throughout Teller and Park counties and depending on the location of the housing tracts, it is uncertain if central wastewater treatment service will be possible or if OWTS will be necessary. However, if the need for future central wastewater treatment facilities arises in Park County, it should be limited to the five subareas identified in the Park County Strategic Master Plan (Clarion Associates, 2001), which are Bailey, Fairplay/Alma, Hartsel, Lake George, and Guffey. To minimize the number of septic systems and possible water-quality impacts, future growth in the Hartsel, Lake George, and Guffey areas (areas where wastewater treatment plants currently do not exist) will be evaluated to determine the need for a central wastewater treatment plant.

8.5.1. Town of Alma

More stringent phosphorous and ammonia levels will require modifications and upgrades be made to the Town of Alma Wastewater Treatment Plant. The types of modifications and upgrades have not been determined but could include a digester. Currently working on feasibility study to upgrade or explore alternative options.

8.5.2. Florissant Water & Sanitation District

Five-year construction needs include process improvements for winter ammonia reduction, and cell improvements to relieve ice-caused damage to baffles.
8.6. South Platte and Upper South Platte Point Source Discharge Locations
8.7. City of Woodland Park

On March 2, 2017, the City of Woodland Park began construction on its wastewater treatment plant expansion. The $7.22 million project was overseen by Moltz Construction of Salida Colorado. Completion of the project ended in June 2018 to increase the capacity of the plant to serve a population of 14,100.

8.8. Existing Conditions Major Discharge Facilities

Within the portion of the South Platte Headwaters and Upper South Platte Watersheds in Teller and Park Counties, there are 10 wastewater treatment facilities (six major and four minor discharge facilities discharge into the South Platte or its tributaries). There are also several minor seasonal operating facilities and a number of recreationally based operations utilizing on-site disposal systems. No restrictions are required of these facilities other than those set by the Colorado Department of Public Health and Environment in the CDPS permits.

8.8.1. Town of Alma

The Town of Alma is located in the northwestern part of Park County along Highway 9. Alma was established as a mining community, and the original potable water supply and distribution network were constructed in the late 1800s. A sanitary sewage collection system was not built until 1979.

The treatment facility consists of a two-cell aerated lagoon system with chlorination facilities. The treatment facility was rebuilt in 1992 and the original two-pond system was replaced with a three-pond system with diffused aeration equipment in each pond. The system has a design limit of 0.117 mgd, and the final discharge of effluent is to the Middle Fork of the South Platte River (Upper South Platte River Segment 1a).

8.8.2. Fairplay Sanitation District

The Fairplay Sanitation District was formed in 1970 and shortly thereafter undertook its initial construction to serve the Fairplay area. A new wastewater treatment facility became fully operational beginning in 2009 (the discharge permit issued from CDPHE was effective March 1, 2009). Discharge levels for ammonia are below the permitted limits. The facility discharges to the Middle Fork of the South Platte River. There is also a lift station on the south side of the Platte River that serves the mobile-home park and businesses on that side of the river.
8.8.3. Florissant Water and Sanitation District

The Florissant Water and Sanitation District was created in 1979 to provide water and sanitary sewer service within the district boundaries. The operating system consists of a three-cell lagoon system with aeration of the first two cells. Chlorination is used to reduce fecal coliform and ammonia concentrations to levels that do not negatively affect the existing stream uses of Twin Creek. Dechlorination is used to reduce the effluent residual chlorine levels prior to discharge. The system went into service and operation in the early spring of 1988, and this system now receives 18,500 GPD. Florissant, as part of their permit compliance schedule, has recently completed addressing seepage rates from their lagoon system. The facility discharges to Twin Creek about 0.25 miles west of Florissant.

8.8.4. Bailey Water and Sanitation District

The Bailey Water and Sanitation District was formed in 1969 to provide sanitary sewer service to the Town of Bailey. Prior to this time, residents and businesses in Bailey had OWTS. In 1969, a sanitary sewer collection system was installed along with an extended aeration sewage treatment facility. The sewage treatment facility installed in 1969 did not have adequate capacity and could not meet NPDES permit limitations. Thus, in 1979, a used plant including its equipment was purchased and transported to Bailey. The new facility used the polishing pond of the original facility as an aerated lagoon. The expanded facility also added a mechanical aeration basin and tertiary treatment facilities, which included a chemical mixing basin, sludge settling basin, and a multimedia filter. The district upgraded the WWTP in 1992. Improvements to the plant included a new decant system, a new control system, and a cover for the reactor basin. These upgrades have resulted in a marked improvement in the quality of effluent discharged by the plant, and the district has not had any violations of their discharge permit. Plans are presently being implemented to improve sludge handling capability and to improve the control of the treatment process. The facility discharges to the North Fork of the South Platte River.

8.8.5. Will-O-Wisp Metropolitan

The Will-O-Wisp Metropolitan District is a planned-unit development in the northeast part of the Park County. Its location is approximately 1,000 feet west of the Jefferson County line. The district’s wastewater treatment facility was operational beginning in January 1988, and the present flow is 0.025 mgd, about 20% of capacity. This facility is high quality but is designed for a much larger flow than is produced by the current population; thus, it is underloaded and is not operating as efficiently as it might. The facility discharges into Wisp Creek (Upper South Platte River Segment 4) and all monitoring results indicate discharges are well below required state
A downturn in the real estate market in the late 1980s and early 1990s resulted in no growth to the community. The Will-O-Wisp Metropolitan District declared Chapter 11 bankruptcy and operates under a reorganization plan. With the upturn in the real estate market in 1995 and 1996, the district has grown to 107 homes which are located in Filing One. The original plan projected population for the entire development at 2,747. Projected population is dependent upon development of the remaining four filings, and community growth hinges on the current developer; however, piping surplus wastewater from neighboring Pine Junction in Jefferson County to augment Will-O-Wisp's flow is a possible solution to its under-utilization problem.

8.8.6. City of Woodland Park

The City of Woodland Park provides wastewater treatment for the city, some surrounding areas, and Teller County Water and Sanitation District No. 1. The city is located on a saddle from which gravity wastewater flow naturally splits into north and south drainage basins. All wastewater is treated in an advanced treatment plant located in the north basin adjacent to Trout Creek. Wastewater from the south basin is pumped to the north basin using a 600-gallon-per-minute pump station, 10-inch force main and a 12- to 24-inch interceptor sewer. Two small (88 and 182 gpm) pump stations serve small areas immediately south of the main south lift station.

The Woodland Park wastewater plant discharges to Trout Creek (Upper South Platte River Segment 4), a tributary to the South Platte River, which are both protected as cold-water fisheries. Ammonia removal requirements strongly influenced the plant’s design and its current operation.

Woodland Park's wastewater plant was designed for a flow of 0.893 mgd. The current service population is 8,800 and the current peak monthly flow is only 0.63 mgd, but organic loading has prompted the city to initiate planning and designing of a plant expansion. The expanded plant will serve a population of 14,000 with a 1.2 mgd capacity.

8.9. Minor Discharging Facilities

8.9.1. Teller County Wastewater Utility (servicing Divide)

In April 1995, the Teller County Board of Commissioners established, by resolution, the Teller County Wastewater Utility, which services Divide. The utility is directed by a board of directors and is managed by a utility manager.
Currently, the Teller County Wastewater Treatment Facility is operated by the City of Woodland Park's Utilities Department, and billing administration is done by Divide Water Providers, Inc. Wastewater sludge is treated through a contractual agreement with the City of Woodland Park at the city's treatment facility. Future expansion of the plant and the collection system will be based on development in the area. At this time, there are over 1,000 preliminary or platted lots within the current service area. The system produces approximately 0.030 mgd of sewage for treatment. The discharge is to Rule Creek (Upper South Platte River Segment 4), immediately east of the treatment plant.

8.9.2. Platte Canyon School District

The treatment process includes a three-stage lagoon system consisting of aeration, followed by a polishing pond and chlorine disinfection. The peak hydraulic design capacity is 0.019 mgd, and it has an organic capacity of 50 lbs/BOD5 day.

8.9.3. Deer Creek Metropolitan District

The Deer Creek Metropolitan District WWTF was approved in 2003 and is located immediately north of Highway 285, approximately two miles north of Bailey in Park County. It provides service to the Deer Creek subdivision, a 21.68-acre site primarily consisting of commercial developments, a grocery store, retail stores, restaurants, and banks. The design capacity is 0.0125 mgd; discharge is to Deer Creek, a tributary of the mainstem of the North Fork of the South Platte River.

8.9.4. Camp Alexander

Camp Alexander has permit limits for BOD and Total Suspended solids (30-day average/7-day average) which are 30/45 and for *E. coli* which are 6,000/12,000.

8.10. Industrial Facilities

8.10.1. Snow Storm Sand and Gravel

The Snow Storm placer deposit is located midway between Alma and Fairplay along the Middle Fork of the South Platte River. M & M Mining Company was sold to Zigan Sand & Gravel Company and then to the Snow Storm Sand and Gravel Company. The discharge permit is currently inactive. The historic operation of the mine included hydraulic and dredge workings. A 1940s floating wash plant is still currently on site. In 1989, M&M Mining Company submitted a site application for a fresh-water holding pond, a screening plant, two sluices, two settling canals, and a multi-acre main recycling settling pond.
The Snow Storm Sand & Gravel Mine is permitted under the state’s general permit for placer mining operations, which also includes provisions for stormwater discharge. The mine was originally permitted to discharge to the Middle Fork of the South Platte River, but under normal circumstances there is no discharge.

The final plot was approved in May 2003 for Glacier Ridge Subdivision, located adjacent to the mining company. This is a 322-acre subdivision containing 62 residential lots and seven acres of open space. The recommendations made by Park County staff were to restore the well water quality and initiate advanced treatment for the septic systems, at least 200 feet from wells.

8.10.2. London Mine LLC

The London Mine Tunnel is located about 12 miles northwest of Fairplay. Hardrock mining is done for gold and silver ore. Both Mosquito and South Mosquito Creeks are water-quality impaired for zinc and will require a total maximum daily load (TMDL).

Historically, zinc concentrations in South Mosquito Creek ranged from 110 μg/L to 749 μg/L, and 95 μg/L to 750 μg/L in Mosquito Creek. The chronic zinc table value standards for South Mosquito Creek and Mosquito Creek are 250 μg/L and 110 μg/L, respectively. The London Mine Tunnel is used for mine dewatering and requires an industrial stormwater permit. A permit renewal and extension were granted in October 2018.

8.10.3. London Water Tunnel

The Colorado Discharge Permit (CO-0038334) for London Water Tunnel, which was constructed in 1918, is for the outfall from the final settling pond. This is approximately one mile above South Mosquito Creek’s confluence with Mosquito Creek. The discharge from the final settling pond is in the range of 1.0 to 1.5 mgd from a 2.0-million-gallon settling pond constructed in 1988. The discharge from the final settling pond where it enters South Mosquito Creek is generally lower in mineral content than the creek. The permit for the water tunnel currently has seasonal metals effluent limitations based on the temporary modifications of water quality standards. Discharge from the final settling pond is tested and reported as required by the permit. Since 1991, no mining was conducted in the water tunnel. This permit contains specific standards for metals. During all four quarters of 2009, the water tunnel had effluent violations for dissolved cadmium and dissolved zinc.

8.10.4. Extension Tunnel

A permit (CO-0045209) has also been issued for the effluent from the extension tunnel. The
extension tunnel water is collected at the tunnel entrance via a small corrugated plastic pipe to an unnamed creek. This discharge point is several hundred feet above the confluence of the unnamed creek and South Mosquito Creek. During several quarters of 2009, the extension tunnel had effluent violations for dissolved cadmium, dissolved zinc, total suspended solids, and pH (EPA Enforcement and Compliance History).

The London Extension Tunnel has not been reclaimed, and various treatment options are still being considered. This erosion substantially increased the sediment and metals loading in Mosquito Creek. As part of a 319 Nonpoint Source project in 1998, tailings were consolidated, regraded and revegetated. Drainage channels also were excavated around the tailings in the lower valley. In 1998, a neutralizing system, diversion ditches, and settling pond spillway were built by the Division of Minerals and Geology. Sediment loads during storm events were demonstrably lower than pre-319 project conditions.

8.11. Major Point Source Service Area Maps

A summary of point source data is presented in Table 4, Appendix C, which shows information obtained from the treatment facilities. Service area maps show projected service area boundaries for each facility previously described. The background of these maps is Google Earth satellite imagery which was last updated in September 2005. Major point source discharge locations are shown on the service area maps.
8.12. Figure: Alma and Fairplay Sanitation District Service Area
8.13. Figure: Florissant Sanitation District Boundaries
8.14. Figure: Bailey and Will-O-Wisp Sanitation District Service Area
8.15. Figure: City of Woodland Park Service Area
8.16. Nonpoint Source Assessment

Nonpoint source pollution is defined as a degradation of water quality from diffuse sources. This section will cover the effects on groundwater and surface water from agriculture-silviculture, hydrologic modification, land disposal, solid water disposal, source extraction, OWTS, and recreation.

8.17. Agriculture and Silviculture

There is very limited agriculture in Park County. In the eastern portion of the watershed, agricultural lands consist primarily of riparian and mountain grasslands which are situated on private lands along the river. The total number of acres being farmed or ranched decreased by 30% from 1987 to 1997, from about 400,090 acres in 1987 to 311,182 acres in 1997 (Clarion Associates, 2001). These areas are used primarily for livestock grazing and a minor amount for hay production. Fertilizer runoff from hay meadows and pesticide runoff from noxious weed spraying are potential sources of pollution in the county, but there is no documentation of the problem from these sources. The Conservation Districts and the Natural Resource Conservation Service are encouraged to continue their educational efforts to promote effective utilization of these products without damaging the receiving waters. Some BMPs found effective in minimizing the amount of erosion include grazing management techniques and strategies such as rotational grazing, deferred grazing, proper grazing use, critical area treatment, sediment basins, and grade stabilization structures (CDPHE-WQCD, 2000).

Erosion in riparian areas from overgrazing continues to be a problem on private and public lands. Many ranchers have instituted conservation measures such as rotation and deferment to decrease the erosion; however, a problem still exists in some areas such as Spring Creek. Erosion also occurs through activities such as building roads. BMPs suggest the use of vegetation and/or structures in-stream and on immediately adjacent areas of streams, or construction of channels to stabilize and protect against erosion.

Silviculture is the practice of caring for forests with respect to the human objective. This is extremely important in the South Platte and Upper South Platte Watersheds due to the number of fires that have occurred recently within the region. Silviculture imitates a natural change—such as a beetle infestation or fire—and these methods can be effective at reducing the severity and possibility of fire in the future.
8.17.1. Wildfires

Due to the drought, wildfires are an increasing concern in this region. During the past nine years, there were two major wildfires and numerous smaller wildfires within the watershed. Major fires include:

<table>
<thead>
<tr>
<th>FIRE</th>
<th>COUNTY</th>
<th>Number of Acres Burned</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 Weston Pass fire</td>
<td>Park</td>
<td>13,023</td>
</tr>
<tr>
<td>2012 Springer</td>
<td>Park</td>
<td>1,100</td>
</tr>
</tbody>
</table>

The 2012 Waldo Canyon fire burned over 18,000 acres across four major watersheds, Camp Creek, Douglas Creek, Fountain Creek, and West Monument Creek. Although the fire did not occur near the Upper South Platte Watershed, CUSP responded with a variety of post-fire recovery efforts, along with monitoring efforts to assess the effectiveness and resilience of post-fire watershed treatments in the Waldo Canyon burn scar. In 2013, a watershed assessment was conducted for the Waldo Canyon Fire burn area using the WARSSS methodology: Watershed Assessment of River Stability and Sediment Supply (Rosgen, 2006/2009). The assessment can be found at https://cusp.ws/wp-content/uploads/2014/10/1.WaldoCanyonFireAssessmentReport.pdf along with other report efforts at https://cusp.ws/reports/

High sediment levels in the creek can lead to sediment build-up in Cheesman and other reservoirs, which can cause a reduction in the amount of water storage, and can require costly strategies to remove the sediment. The US Forest Service and CUSP are using techniques that include seeding, planting trees, trenching to slow down and divert water, and constructing temporary dams or placing straw bales in gullies to promote rehabilitation and restoration of the land. In spite of these ongoing efforts, areas of the watershed at high to moderate intensity are still vulnerable to intense erosion, as witnessed in Teller and Douglas counties in 2007 and Douglas and Jefferson counties in 2009. Community wildfire protection plans were adopted by Teller and Park counties, and they are working with the US Forest Service, CSFS, CUSP, and local fire protection districts to mitigate fuels.
8.17.2. Conservation Easements

Conservation easements have become an important tool in Park County and other communities to preserve areas for future protection. Some important conservation easements have occurred since the last update of the plan in 2010, which include:

- Allen Creek Ranch: This property is located along Park County Road 77 and abuts the Pike National Forest. In addition to its scenic values, Allen Creek Ranch contains over 3 miles of Tarryall Creek and supports one of the best examples of a globally rare riparian community comprised of blue spruce and water birch. The Ranch also contains mixed conifer forest, grassland, willow thickets, and irrigated hay meadows. The conservation easement also protects water rights used to irrigate hay meadows and Tarryall Farms. Allen Creek Ranch is now open to public fishing, on a reservation basis, at South Park Fly Fishers. Funding for the Allen Creek Ranch conservation easement was provided by Great Outdoors Colorado, the Park County Land & Water Trust Fund, Colorado Division of Wildlife, National Fish & Wildlife Foundation, and the Hillsdale Fund, Inc.

- Deer Valley Park Association: Colorado Open Lands is coordinating fundraising efforts on behalf of the Deer Valley Park Association. The goal is to secure adequate funds to purchase a perpetual conservation easement on this Centennial Ranch. Centennial Ranches are ranches owned and operated by the same family for 100 years or more. To this end, the Park County Land & Water Trust Fund has committed $500,000 toward the purchase of a conservation easement valued at $1.5 million.

Further reports on Park County conservation easements, along with an easements map, can be found at [https://parkco.us/646/Conservation](https://parkco.us/646/Conservation)

8.18. Hydrologic Modification

Hydrologic modification in Park County has historically taken place for irrigation of agricultural land. However, most of the agricultural water rights were bought by Front Range municipalities, which are using hydrologic modification to provide drinking water. The effects of the diversions and reservoirs on the water chemistry of the stream basins have not been documented. This has become an extremely critical issue recently because of the drought.

Streamflow in the basin is driven by snowmelt, with the majority of the runoff volume occurring in the late spring/early summer. Low flow for these streams happens in the late fall and winter, and most rainfall runoff in the basin comes from summer convective storms and
upslope rainstorms. The natural flow regime was modified over the past 150 years due to irrigation, water diversions, introduction of transmountain water, and water storage reservoirs.

8.18.1. Transbasin Diversions

Denver Water’s Roberts Tunnel and Aurora’s Otero Pipeline are the two major transbasin imports into the Upper South Platte River. The Roberts Tunnel delivers water from the Lake Dillon collection system to the North Fork of the South Platte just upstream of Grant, Colorado. The City of Aurora imports water from the Homestake Project and other Colorado and Arkansas water supplies via the Otero Pipeline into Spinney Reservoir.

Aurora and the City of Colorado Springs equally own the Otero Pipeline. Roberts Tunnel is discussed in Section 6.3, South Platte and Upper South Platte Point Source Discharge Facilities.

Other transbasin imports include the Boreas Pass Ditch and Colorado Springs Blue River Tunnel. Both of these are minor inputs into the Upper South Platte River. Colorado Springs will usually take Blue River water via a pipeline but can release water into the South Platte.

The City of Aurora lost the conjunctive use case. This project would have pumped groundwater from the South Park aquifer for use by the City of Aurora to maintain its existing needs and to meet future needs. However, Park County continues to meet with Aurora on possible options in the future to transfer water. The future storage needs of Aurora are 35,000 - 40,000 acre feet; Denver needs 80,000 acre feet and Park County needs 1,000 - 1,500 acre feet.

8.18.2. Roberts Tunnel

The Roberts Tunnel, owned and operated by the Denver Water Department, diverts high quality water from Dillon Reservoir in Summit County and discharges it into the North Fork of the South Platte as part of its water supply for the Denver area. The Roberts Tunnel brings about 23% of Denver’s water from Lake Dillon to the North Fork. A 1985 agreement between Summit County and the Denver Board of Water Commissioners allows tertiary treated effluent from wastewater treatment facilities discharging to Dillon Reservoir to be discharged directly to the Roberts Tunnel when Denver is transporting a minimum of 50 cubic feet per second through the tunnel.

The Snake River Wastewater Treatment Plant, owned and operated by Summit County, has
received approval from the Northwest Colorado Council of Governments for the potential future direct discharge to the Roberts Tunnel. Northwest Council of Governments’ water quality and quantity efforts are involved in Technical Assistance (TA) programs dealing with water resource development and water quality protection. They are currently involved in water quality with regard to phosphorous load allocations from the Roberts Tunnel; regulations that might indirectly affect Park County land use; and setbacks to OWTS. Under the CDPHE WQCC, Division Reservoir Control Regulation (Regulation #71, 2007), the Snake River WWTP is allowed a phosphorus discharge of 340 lbs/year.

Residents of Park County are very concerned about potential water-quality degradation to the North Fork South Platte. Communities in Park County that utilize the South Platte as a water supply include Grant, Santa Maria, Bailey, Insmont, Mooredale, Glen Isle, Shawnee, and Eastbrook.

8.18.3. Reservoirs

Reservoirs are a major factor in the modified hydrology regime. The principal reservoirs in the Upper South Platte Basin are Antero, Eleven Mile, Cheesman, Spinney Mountain, Tarryall, and Strontia Springs. Denver Water owns and operates Antero, Eleven Mile, and Cheesman reservoirs. The City of Aurora owns and operates Spinney Mountain Reservoir. Denver and Aurora jointly operate Strontia Springs Reservoir. Taryall Reservoir is owned and maintained by CPW. Other reservoirs include, but are not limited to, Jefferson Lake, Wellington Lake, Montgomery, and Lake George.

Invasive aquatic species have become a major concern for reservoirs in the watershed. Zebra and quagga mussels were found in the state, and CPW is concerned these may be transported to reservoirs in the watershed. Currently, the CPW employs seasonal employees at the reservoirs to inspect all boats entering and leaving the lakes for transport of invasive species.

8.18.4. Wetlands and Peatlands

Other areas that have experienced the effects from hydrologic modifications include the peat fens and wetlands. Wetlands and peat fens provide important wildlife habitat and water filtration functions. Park County has some unique peat fens with species not found anywhere else in the continental United States. The unique beneficial water-quality features of these fens are discussed in the water quality analysis section of this report.

The High Creek Fen was nationally recognized for its unique species and has been acquired by
the Nature Conservancy. Unfortunately, some of the lesser fens were mined and have suffered irreversible damage to their filtering capacity. A report entitled *An Evaluation of the Effects of Peat Mining on Wetlands in Park County, Colorado* was completed in February 1990. In addition, an inventory of the calcareous fens was completed (Johnson, 1998; Johnson, 1996) and is described in more detail in the Surface Water Section for the South Platte Basin.

The Colorado Natural Heritage Program (CNHP) completed the Park County Inventory of Critical Biological Resources in April 2001. CNHP uses a multidisciplinary team of scientists and information managers to gather information on rare, threatened, and endangered species and significant plant communities in Colorado. Scientists study life history, status, and location of the species; information is entered into the Biological and Conservation Data System and then mapped using GIS technology. The final job is to rank the most sensitive or imperiled Potential Conservation Areas (PCA).

In Park County, the CNHP team identified 35 PCAs that are home to over 115 rare or imperiled plant species, animal species, or significant planning communities. Nine recommendations were made for protecting Park County’s biological resources.

South Park is one of only a few areas in Colorado designated as a state wetlands focus area by the Colorado Wetlands Initiative Program, administered by the Colorado Division of Wildlife. The South Park Wetlands Focus Area Committee has secured over $7 million for conservation easements since 1999. High Creek Fen, located in South Park, is one of the most biologically diverse fens known in the Southern Rocky Mountains and contains more rare plant species than any other wetland known in Colorado. The Nature Conservancy owns about 1,200 acres of High Creek Fen and plans to purchase about 560 acres of high-quality wetlands and 4,500 acres of uplands in the High Creek Basin. The goal of the wetlands initiative in South Park is to ensure these predominately natural wetlands are protected (Division of Wildlife, Strategic Plan for the Wetland Wildlife Conservation Program, [https://cpw.state.co.us/Documents/LandWater/WetlandsProgram/CDOWWetlandsProgramStrategicPlan110804.pdf](https://cpw.state.co.us/Documents/LandWater/WetlandsProgram/CDOWWetlandsProgramStrategicPlan110804.pdf)). The wetlands initiative, with the support of private landowners and the county, is expected to protect 7,350 acres.

8.18.5. **Park County Peatlands**

Park County’s peatlands were subjected to a number of significant types of disturbances since the area was settled in the 1800s. Historically, ditching was probably the most critical disturbance to the peatlands. Ditching was undertaken to dry the peatlands so they could be
converted to agriculture. While the ditching and draining of peatlands still occurs, currently the most significant threat to these sites is peat mining. Peat is a partially decomposed plant material that has accumulated over the centuries. It is extracted from these sites primarily for use in agriculture and home gardens, but it is also sometimes removed to create ponds or to expose underlying mineral deposits.

Peatlands comprise a small but important part of Colorado’s natural lands and are often associated with rare or imperiled wetlands known as fens. These wetlands provide unique and irreplaceable habitat for a number of rare plants and perform many important environmental functions.

An additional concern for water quality planners is, after mining, operators are required to perform little or no site reclamation or restoration. This is diametrically opposed to ore-mine regulations, which require operators to perform extensive site restoration upon cessation of mining activity. This policy is mainly a bureaucratic artifact because wetland decisions fall primarily under the jurisdiction of the US Army Corps of Engineers, rather than under state or federal mining agencies. Although peat miners are not subject to a consistent policy with regard to site reclamation, governmental managers should be prepared with a reclamation strategy because many of these sites reside on public lands.

8.18.6. South Park Heritage Resource Area (SPHRA) Study

South Park was designated a National Heritage Area on March 30, 2009. The designation was part of an Omnibus Public Lands Management Act, and now this area is one of 49 National Heritage Areas across the country and only one of three in Colorado. The same process utilized in South Park will be used for Tarryall Creek, where future restoration and protection options are now being developed for areas along the Creek. A report exploring these options, *Tarryall Creek Restoration Overview Report* (2002), has already been completed. In order for the County to apply for grants, they developed a 10-year master plan in April 2013. This designation is expected to enhance tourism and provide access to federal funding. The master plan included four goals:

1. Conserve and enhance South Park's natural, cultural, and recreational resources.
2. Facilitate partnerships between local, regional, and national organizations that will benefit South Park.
3. Provide responsible interpretation of, access to, and education of South
Park’s resources to the public.

4. Promote South Park’s resources to generate sustainable economies.

The full master plan can be found here:

The purpose of the South Park Heritage Resource Area Study, conducted in 1996, was to identify key resources that express South Park’s heritage through time. The study area was located in the 900 square-mile basin of South Park and included surrounding upland areas, the Mosquito Range, the Tarryall Range, and the Thirty-Nine-Mile Mountain Volcanic area. In this study, South Park was identified as having more “fens” than any other region in the continental United States and over 50,000 acres of wetlands (Shapins Associates, 1996).

Priority actions were developed to build support for heritage conservation, to help traditional industries remain in production, and to conserve heritage resources having the highest value and greatest impact potential. The study contains strategies that provide a basis for future efforts such as partnership building, cooperative planning, tourism management, resource conservation, environmental education, and resource interpretation. This effort was the first step towards acquiring conservation easements and retaining high-priority ranchlands as productive agriculture areas.
8.19. South Park Resource Heritage Area Boundary and Mining Locations
8.20. Development of Conservation Easements

The Heritage Resource Study provided the impetus for conserving the highest priority property in South Park (Wahl-Coleman Ranch) in 1999. Following this, Park County received an EPA Regional Geographic Initiatives Grant in 2000 to initiate the Upper South Platte River Conservation Planning Project. This Plan targeted stream corridor properties containing significant agricultural, riparian, and/or wetland resources.

In December 2002, Park County was awarded grants by GOCO ($3.5 million) for the long-term conservation and restoration of South Park's outstanding natural resources, including river corridors, rare wetlands, and working cattle ranches. The project involved more than 16 participating landowners, to ensure the conservation of more than 13,000 acres and over 28 miles of stream corridor. The funds were used to purchase conservation easements (acquire the rights to develop land, but do not actually purchase the land) on targeted properties with wetland and riparian habitats in South Park. The funds provided stewardship endowments for the easements along the South Fork of the South Platte River, Fourmile Creek, and Agate Creek. The lands included in this study are wetland and upland habitats that support rare or imperiled species. Among the resources preserved are one of the largest concentrations of rare or imperiled plant communities in the lower 48 states and the most Gold Medal trout water in Colorado (Fairplay Flume, 2002).

8.21. Solid Waste Disposal

The primary method for solid waste disposal in the county is the use of transfer stations. The designated transfer stations collect solid waste for transport to landfills outside of the county. No landfills are expected to be built in Park County in the near future. Illegal dumping into ditches and ravines is a problem in the county. Most of the transfer stations collect recyclable glass, newspaper, aluminum, plastic, magazines, and office paper. The recycling of these items results in a reduced load to the landfills. Waste lagoons in Park County consist of municipal or animal waste lagoons or mine ponds. It is not known how many, if any, of these are potential threats to the groundwater near them.

8.21.1. Land Use

Park County recently completed making major revisions to their Land Use Regulations (https://parkco.us/189/Land-Use-Regulations). Revisions to the land use codes address some of the major current and probable future anthropogenic impacts to surface water and groundwater quality. Major changes that could improve water quality management in the
future are:

- Floodplain setbacks that are 100 feet in all zones for new lots and will be measured from the middle points of the streams.
- Wetlands protection—a 50-foot setback in wetland areas
- Developers must be able to prove availability of surface water for a central water supply.
- Requirements for drainage control.
- Requirements for Erosion and Sedimentation Control Plan.
- Requirements for wildfire mitigation.

8.21.2. 1041 Permits

Requests for 1041 permits have increased in Park County, especially wildlife habitat, water, and wastewater permits. These permits are designed to facilitate identification, designation, and administration of matters of state and local interest that are beyond the scope of traditional zoning or subdivision regulations. One of the purposes of requiring these permits is to ensure the environmental impacts of new development are considered and mitigated. Through 1041 permits, local governments can designate areas of state interest, which include mineral areas; natural hazard areas; areas containing historical, natural or archeological resources of statewide importance; and areas around key facilities (airports, public utility facilities, and mass-transit terminals). However, a developer does not have to agree on any conditions imposed in a 1041 permit, but any conditions imposed on the 1041 permit approval shall be followed by the developer or the developer will be subject to legal actions.

8.22. Urban Runoff

Although covered under an MS4 permit coverage area, roadside erosion is also a serious problem in the more developed areas of the eastern section of the watershed. Increased potential for soil erosion occurs in areas of high human activity. When the soil’s protective vegetative cover or topsoil is disturbed, on-site productivity is reduced and water quality is degraded by sedimentation. The amount of sediment, oils, and solvents released through urban runoff will increase as commercial and residential development continues in the two counties. Recent NPDES Phase II Stormwater Regulations have not affected Park or Teller counties or any of the municipalities within them.
8.23. Recreation

Mountain biking, camping, skiing, hiking, and fishing are the primary tourism activities in the area, but snowmobiling and use of off-road vehicles are growing rapidly. The number of people enjoying these activities is increasing yearly, with Highway 285 becoming congested during the weekends. In addition to vehicular emissions, the heavy use of the counties for tourism is adversely affecting the water quality through erosion from overuse of unsurfaced roads, backcountry trails, campgrounds, and reservoirs. There may come a time when permits are needed to preserve some of these areas for everyone to use. Many of the abandoned logging roads become heavily used by tourists, resulting in washboard conditions, large ruts, and erosion.

8.24. Resource Extraction

Historically, lode mining for gold played a big role in Park County, but operations have shifted towards surface mining of sand and gravel and other raw materials. Currently, there is a sand and gravel operation along the Middle Fork of the South Platte. Past mining activities have degraded portions of the South Platte River include Geneva Creek in Platte Canyon, Mosquito Creek, and South Mosquito Creek near Fairplay; Tarryall Creek and Buckskin Creek near Alma; and the headwaters of the South Fork in the southwest section of the county. The impact of these mining activities is further discussed in the water quality analysis section.

Abandoned mines and tailings are the primary sources of elevated metals in streams with natural mineral seeps as secondary sources. In general, surface water is greatly affected by resource extraction while aquifers are not. Natural geologic conditions can also cause low pH levels, and some metals are transported in the streams in the dissolved phase because of the low pH. As the pH of the water rises, the metals become attached to suspended sediment and travel further downstream until they are deposited along the riverbanks. The dissolved species are a primary indicator of potential drinking water problems, especially when shallow wells are drilled within these areas. In general, waters with high dissolved-metal species tend to be devoid of aquatic life because of acute toxicity and can pose long-term problems for aquatic life.

8.24.1. Alma American Milling Corporation

The American Mill was a precious metals mill that produced gold, silver, lead, copper, and zinc concentrates from ore. During operation, approximately 200 tons of ore were processed daily.
Its effluent discharged into Mosquito Creek. Due to market conditions, the mill was shut down since 1984. The mill was removed and its holding pond filled and leveled off. Although issued a discharge permit in 1993, the mill will remain closed indefinitely.

8.24.2. Montgomery Mill

Natural revegetation occurred at some of the historic mill tailings at the Montgomery Mill site (also referred to as Alma/Betts in some documents). However, metals were being leached from nonvegetated tailings on the south side of the valley by water flowing over and through the tailings. In 1991, the nonvegetated tailings were moved from the valley to an area above the water table and adjacent to the remains of the old Alma/Betts Mill. The tailings were then covered with soil from the site and revegetated in 1992. Partial funding for these activities came from the 319 Nonpoint Source Grant with in-kind services provided by Park County and the Colorado Parks and Wildlife (CPW), Trout Unlimited, and the Park County Mining Association. The results of this work can be found in the Preliminary Assessment, London Mines/Mosquito Creek Basin (CDPHE – HMWCD, 1998).

8.24.3. London Mill

Erosion of the London Mill tailings contributed sediment to South Mosquito Creek. Drainage through the nine-acre tailings flowed through three ditches that were eroded in places to a depth of 20 feet. In addition, wind erosion moved the tailings downstream. To reclaim the area, the slope of the tailings piles was decreased to minimize erosion. The drainage flow was channeled into a settling pond before discharge into South Mosquito Creek. The entire area was covered with soil and revegetated in 1992.

8.24.4. Buckskin Gulch

The Division of Reclamation, Mining and Safety conducted water quality sampling and analysis on the Buckskin Gulch mine drainage (draining Red Amphitheater just above Buckskin Gulch Road) during the summer of 1990. The lab analysis indicated elevated levels of zinc, manganese, aluminum, and strontium. Water quality at the Alma intake two miles downstream of Red Amphitheater is within acceptable limits. Subsequent assessment indicated the metals were of natural origin, resulting from erosion of the Amphitheater itself.
8.25. Onsite Wastewater Treatment Systems (OWTS)

Wastewater generated in densely populated areas is primarily treated at municipal wastewater treatment plants (WWTPs); however, septic systems are used in rural areas where wastewater treatment systems are not economically feasible. Septic systems have the potential to contaminate groundwater and surface water, either through percolation of wastewater through the soil into groundwater, which recharges surface water, or by surface runoff. If septic systems are improperly designed or installed in soils unsuitable for the disposal of wastewater, nitrate can leach into groundwater and can seep into nearby surface waters. Surface water contamination from septic systems can also occur due to system failure. When a septic system fails, the capacity of the soil to absorb effluent is exceeded and waste moves to the soil surface, where it can be carried to surface water via overland flow. However, if septic tanks are not immediately adjacent to surface water, the potential for nitrate to leach into the surface water is minimal.

A major concern of septic systems is that a high density of systems in one area can lead to ineffective treatment. Small parcel sizes cause septic systems to be placed closer together and increase the possibility of groundwater contamination. Depending on the underlying soil, effluent can move faster or slower down to the groundwater, as is evident in southeastern portions of the watershed.

For the majority of Park County citizens, OWTS is the method used for disposal. Between 1991 - 2002, Park County issued an average of 500 permits a year, and between 2002 - 2008, Park County issued 300 permits a year. Inadequate systems may be affecting groundwater, particularly in the northeastern and northwestern portions of the county where rapid growth is occurring (Park County Strategic Plan). Park County has two full-time inspectors who are conducting OWTS as well as non-community groundwater inspections.

Many of the current systems are designed by engineering firms. These systems appear to be an effective means of sewage treatment on lots 35 acres or larger. Inadequate systems may be affecting groundwater in the county, particularly in the northeastern and northwestern sections, which have experienced phenomenal growth in the 1990s. The Park County Environmental Health Department collected samples in 1997 that indicated elevated nitrate concentrations in the northeastern section of the county around Bailey.

There is evidence that implies many homes constructed as summer homes and converted to year-round homes may have inadequate systems. The higher density of small developed lots,
especially the 0.25 to 1 acre lots, combined with an inadequate distance between the leach field and household wells in fractured rock areas, may be stressing the soil’s absorption capacity and contributing to a degradation of groundwater in some areas. However, tertiary treatments are being used in a majority of these situations in hopes of reducing some of these known effects.

Education regarding OWTS is becoming critical as the vast majority of the new citizens of Park County are people who have never lived in a rural setting before. The Park County Environmental Health Department releases information in pamphlets, newspapers, and a website explaining the need for proper disposal, testing, and monitoring of an OWTS. Many of these new residents do not realize the damage that can occur to an OWTS from disposal of household cleansers, and paint and overuse of dishwashers and garbage disposals. They also may be unaware of the need for testing, monitoring, and ongoing maintenance. In addition to testing and monitoring, most do not realize the systems need ongoing maintenance. Owners of new systems currently receive a fact sheet from the Environmental Health Department, and with the assistance with the local real estate organizations, new owners of older homes also receive this educational material.

Teller and Park counties have both adopted regulations requiring a 200-foot separation between a septic system and a well. This helps minimize the amount of contamination and will dilute the effluent before it gets picked up in the well. Setbacks are required to be 50 feet from wetlands and 50 feet from an irrigation ditch.

USGS in cooperation with Park County conducted a water quality study (2001-2004) to determine the effects on groundwater quality of residential development and the corresponding increase in the number of OWTSs on groundwater quality. The data collected indicates recharge from OWTS effluent has affected local groundwater systems. Concentrations of constituents associated with OWTS effluent are low and drinking water quality is good throughout the county. There are some correlations between geology, lot sizes, and year of OWTS installation. In general, groundwater quality was least affected areas with average lot sizes greater than five acres and most affected in areas with average lot sizes of less than one acre.