



RIO GRANDE BASIN ROUNDTABLE TOUR

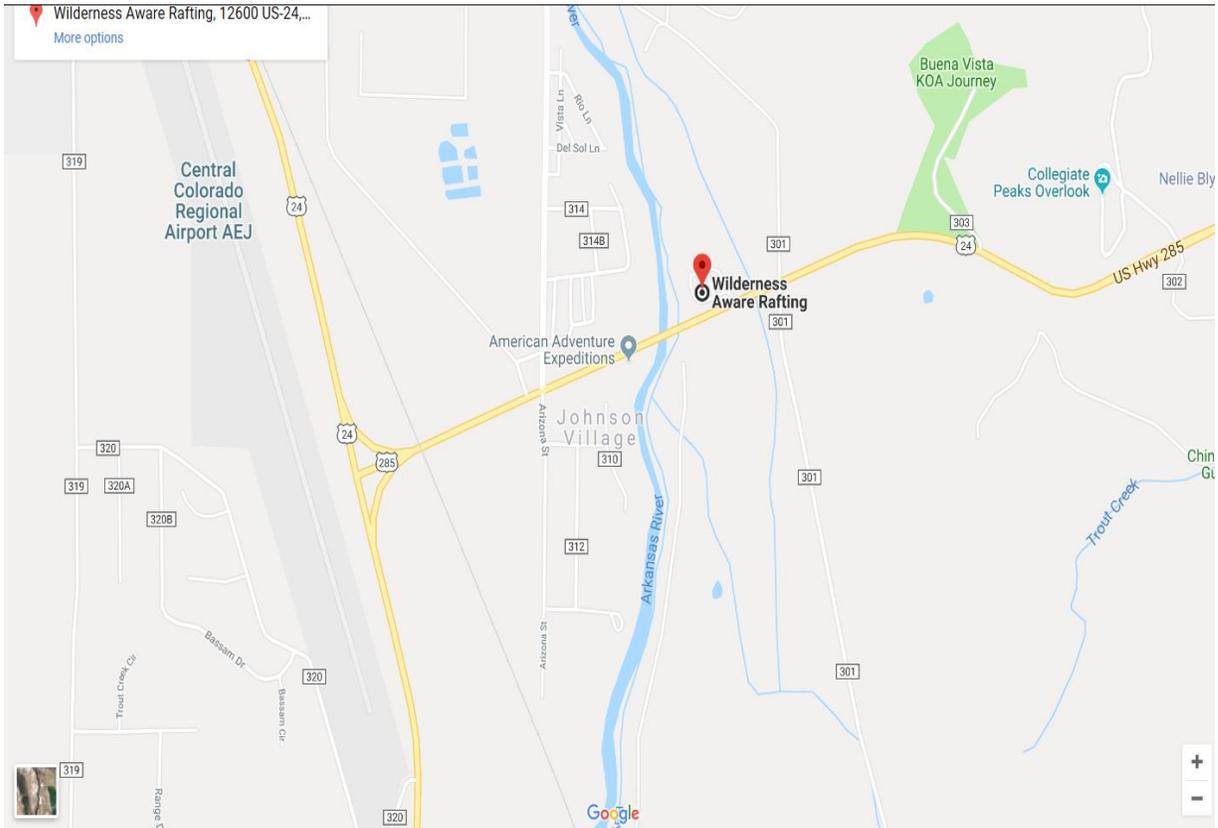
Thursday, July 26, 2018

Agenda

- 8:15 – 8:45** **Meet at Wilderness Aware Rafting, 12600 US 24, Buena Vista, CO**
Parking, Coffee & Refreshments, & Restrooms provided
- 8:45 – 9:00** **Board tour transportation**
- 9:00 - 10:30** **Multi-Use Project at Trout Creek Ranch**
Terry Scanga and Chelsey Nutter - Upper Ark Water Conservancy District
- 10:30 - 10:45** **Drive to Buena Vista**
- 10:45 - 11:45** **Tour Helena Diversion Structure / Buena Vista Boat Chute Improvement Project**
Rob White, Colorado Parks and Wildlife
Voluntary Flow Management Program
Bob Hamel, Arkansas River Outfitters Association & Rob White
- 11:45 - 12:00** **Drive to lunch**
- 12:00 - 1:00** **Lunch at Eddyline Brewery**
- 1:00 – 1:30** **Drive to Wilderness Aware and arrange carpools**
- 1:30 – 2:15** **Drive to Leadville**
- 2:15 - 3:30** **Parkville Water District's Evan Reservoir Bypass Flume Replacement Project**
Greg Teter, Parkville Water
- 3:30** **Depart for Buena Vista**

PEPO

WORKGROUP
ARKANSAS RIVER BASIN





RIO GRANDE BASIN ROUNDTABLE
WATER PROJECT TOUR
of the
UPPER ARKANSAS RIVER BASIN

Thursday, July 26, 2018

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Trout Creek Park Multi-Use Project

Terry Scanga & Chelsey Nutter, Upper Arkansas Water Conservancy District

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The Trout Creek Park property presents unique opportunities for water development and environmental benefits. Continued agricultural irrigation and hydro-geologic attributes that accommodate much needed water storage, coupled with protection of wildlife corridors, access to Arkansas River recreation for fishing and boating, development of wetlands for water fowl habitat, agricultural sustainability and development of low head, off river hydropower production.

No other known property contains all the above elements in one location in the Arkansas River Basin. The pressures from growth require additional water storage and is a call to preserve the social, cultural and environmental fabric unique to this part of Colorado.

Storage of fully consumable water and the management of storage is the key element needed to be successful in facing our future water challenges. A current catchphrase in the water world is “every conversation needs to start with conservation”. In the Arkansas Basin, we also believe that to have a conversation about conservation you must also have a conversation about storage. For conservation to be effective the saved fully consumable water must be stored to be available for use during drier periods. In the same respect capturing water from a wet year to have available for a dry year also requires storage. Thus, storage is essential to meet future demands.

Aquifer Storage is a key component of the Multi-Use Projects. Aquifer storage is achieved by establishing recharge ponds on non-irrigated lands thus using the aquifer as a storage vessel. This reduces the need for traditional surface storage and conserves water by reducing evaporative loss. The type of aquifer storage that will be utilized at Trout Creek Park is a long-term recharge or return flow model. Fully consumable water is infiltrated through recharge ponds and travels along the thalweg (underground river) until it reaches the river. The timing associated with this return flow is the storage component. Aquifer storage can also be used or viewed as a water bank. Fully consumable water can be purchased in a wet year or water conserved through fallowed irrigation lands can be stored “banked” in the aquifer for a future use.

The alluvial aquifer storage project will divert water from Cottonwood Creek at the Trout Creek Ditch Company headgate, conveyed down the ditch, across the river, and into a head stabilization pond. From the head stabilization pond, the water will be piped to a newly-constructed recharge pond, infiltrate into the aquifer, and then accrete to the river along the

recharge path. As the water reaches the stream it may be used in the Upper District's blanket augmentation plan to meet consumptive needs or used to enhance river flows for non-consumptive needs. Plans include, exchanging the excess water (not needed for augmentation) back to the recharge ponds and into the aquifer. Eventually, this system will become a renewable resource that will provide sustainability for future use.

The District was recently awarded a grant from the Colorado Water Conservation Board to move towards implementation of the alluvial aquifer storage component. Phase 1 consists of constructing a pipeline from the existing ditch, delivering water to the recharge pond and monitoring the recharge rates and return flow rates of the fully consumable water. Phase 2 includes the construction of 2-4 additional recharge ponds, delivery systems, and engineering analysis and monitoring.

Surface Storage will be accomplished by utilizing Trout Creek Reservoir. The reservoir has a decreed enlargement of 1,156 acre-feet, of which 671 acre-feet are currently operational. Mr. Paul Moltz owns and constructed the Trout Creek Park Reservoir and is currently finishing engineering design for the enlargement. Negotiations continue between Mr. Moltz and the Upper District to purchase the reservoir. Utilizing existing storage to its full potential is a key objective of the State Water Plan. Aquifer storage provides many benefits, but it requires the conjunctive use of surface storage to meet all demands in a timely fashion. The Trout Creek Park area provides a unique opportunity to integrate the use of surface and groundwater for storage and provide the flexibility needed to utilize the full potential of these storage vessels.

Irrigated Agriculture and ATMs There are approximately 250 irrigated acres in the proposed land purchase at Trout Creek Park. These lands are irrigated with center pivot irrigation systems for maximum efficiency and provide high value hay crops. The lands present a unique opportunity to implement rotational crop fallowing or interruptible water supply farm practice consistent with water conservation efficiencies and best management practices. The best approach is to fallow the lands in a wet year and then place the water in storage to be available for a dry year. Another approach is to plan a fallowing schedule that coincides with planting of perennial Alfalfa crops. The parcels will be fallowed in alternating periods and will provide the least amount of disturbance to the lands and farm operations. A dryland cover crop will be planted for weed and dust control on fallowed lands.

A soil moisture monitoring network is being developed across the Upper Arkansas Basin by the District in partnership with USGS and CSU. Trout Creek Park will serve as a monitoring site. Agricultural contributions to a water balance model are critically important for understanding surface and groundwater interactions. A network of monitoring sites has been installed in fields in Chaffee and Custer counties. The data collected at these sites will contribute to a regional surface and groundwater balance and provide critical data for calibrating/validating an irrigation scheduling tool. **The Water Irrigation Scheduler for Efficient application (WISE) tool**

will be used to better understand hydrologic fluxes under a variety of irrigation conditions and provide information to producers regarding their irrigation management decisions.

Protection of Open Space is a high priority for the Upper District and Mr. Moltz. Both would like these lands to remain in irrigated agriculture with the option for lease fallowing or interruptible supply. These lands are important wildlife corridors and wintering grounds for deer and elk and include approximately 200 acres of land that are high value riverfront property.

Boat Ramp, Facilities, and River Access The District and Mr. Moltz would like to extend the recreational opportunities at Trout Creek Park by constructing a boat ramp and river access for the public along 1.5 miles of the Arkansas River. Currently, there is no public access on these private lands. Access to fishing and boating in this area would provide recreational benefits and would protect the river corridor from future development. The stretch of river directly south of the project area is called Brown's Canyon and was designated a national monument in 2015. It is the highest commercially rafted section of river in the Nation.

Hydropower is a possibility at several locations within Trout Creek Park. The District has studied the use of an off stream, low head, low impact system. This system would be located next to the Arkansas River and fed by the Helena Ditch. Preliminary engineering suggests that 800,000 to 1,200,000 kwh could be produced per year from this system. Another option is to study the hydropower potential directly off the Trout Creek Reservoir dam.

Helena Diversion Structure/ Buena Vista Boat Chute Improvement Project

Rob White, Colorado Parks and Wildlife

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Improvements to the Helena Diversion Structure in the Arkansas River at Buena Vista was beneficial in many ways. The construction project improved the delivery efficiency, availability and sustainability of water for irrigation to water right owners as well as integrated additional boater safety and an improved fishery.

The Helena Ditch Headgate structure included the addition of a concrete ditch channel and flow bypass structure to the Arkansas River. The ditch headgate diversion structure is an integrated system that includes the headgate wall and side gate, delivery channel, and bypass structure. Phase I of the project constructed the headgate wall. Phase 2 completed the replacement of the existing bypass structure and with the Phase 1 improvements allowed the system to regulate water right flow amounts in to the ditch while at the same bypassing excess flows that are experienced during river water level fluctuations.

The project objectives accomplished are:

- Construct a new concrete channel and bypass structure that improved the availability and sustainability of water right flow amounts
- Improved the system's ability to regulate flow amounts while at the same time bypassing excess flows that are experienced at water flow fluctuations
- Improved boater safety and fish habitat by fully restoring all structures associated with the integrated system
- Improved future habitat by installing rock armoring erosion protection
- Improved the overall engineering soundness of the structures

Voluntary Flow Management Program

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The Voluntary Flow Management Program represents 25 years of phenomenally successful collaboration between local, state, and federal organizations to maximize the beneficial uses of water in Colorado's Arkansas River Basin.

The most visible VFMP benefit is the extended boating season on the upper reaches of the Arkansas River. By maintaining targeted river flows from July 1 through August 15, the program ensures consistent recreational boating opportunities. This consistency contributes to the river's status as the most boated whitewater river in the county, which translates into a flourishing recreation economy that enriches the local communities.

Just as important, the VFMP manages river flows to benefit the Arkansas River fishery. While the fishery once suffered from mining pollutants, it now boasts Gold Medal status thanks to environmental cleanup efforts and better management of flows through the VFMP.

Evans Reservoir Bypass Flume Replacement

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Big Evans Reservoir is the lowest of three reservoirs originally built in 1879 that serve the municipal needs of Leadville, Colorado. The reservoir serves as a 21 acre-foot water supply for the Evans Gulch Water Treatment Plant, and is fed by snowmelt and runoff from the surrounding high mountains.

Three mountain basins containing hundreds of mine sites feed nearby Evans Creek. In 1904, Leadville had a Cholera outbreak associated with contamination of Evans Reservoir from mine runoff. Several deaths resulted from this outbreak. Operators of the Leadville Water Company realized that contaminated runoff from the hundreds of mine operations above Evans Reservoir needed to be diverted around the city's water supply.

The Evans Reservoir Bypass Flume was constructed around 1904. It was an elevated, wooden trough measuring 6' x 5' x 450' that diverted water around Evans Reservoir. The flume carried Evans Creek contaminated water around Evans Reservoir. Water carried by the flume contained high turbidity levels. The bottom end of the flume passed through the Evans Reservoir Dam.

Annual maintenance of the wooden structure required heavy effort and expense. Changing weather patterns caused the condition of the flume to become an emergency situation. 8,000 acres of deep snow had been channeled through the flume during spring runoff each year. In the spring of 2014, a sudden runoff combined with spring rains; resulted in an unusually high snow melt. The flume was overwhelmed and the portion that passes through the dam failed. Fairly serious erosion of the dam was the result and emergency repairs prevented further damage. Contamination of the water supply was prevented.

The 2015 runoff was unusually high as well, due to the amount of snowfall and unusually warm temperatures; necessitating emergency actions again. The State Engineer required Parkville Water District to replace the flume. Because repairs to the three dams were also urgent, a large portion of the district 's capital spending had been spent to maintain and upgrade the dams.

The main objective of the Evans Reservoir Bypass Flume Replacement project was to replace the existing wooden bypass flume with a buried pipeline. The project would protect the water quality of Evans Reservoir and protect the dam from potential failure. Parkville Water District constructed a buried pipeline to replace the flume. A Concrete inlet and outlet structures were also constructed, and a trash rack was installed at the inlet.