IBCC Colorado River Basin

1. May 23, 2016 CBRT Minutes

1. May 23, 2016 **CBRT Minutes –Crystal River Management Plan; Kendig Reservoir Feasibility Study; Grand Valley Water Users Association grant request; Colorado Basin Roundtable Legacy Project; Safe Drinking Water Objective in Basin Implementation Plan.**

2. **Next Meeting: July 25, 2016, Glenwood Springs Comm Ctr, 12:00 – 4:00.**

3. Upcoming Meetings
   a. **June 27, 2016, (4th Monday in June) 12:00: Next Steps committee**, Colorado River District office, Glenwood Springs, or call in for the 2-hour conference call.
   b. **Next roundtable meeting: July 25, 2016, Glenwood Springs Recreation Center, 12-4:00 PM**.

4. Reporter: These minutes were prepared by Ken Ransford, Esq., CPA, 970-927-1200, kenransford@comcast.net.

5. **CBRT Members Present:** Art Bowles, Paul Bruchez, Stan Cazier, Kathy Chandler-Henry, Carlyle Currier, Mark Fuller, Bruce Hutchins, Diane Johnson, Merritt Linke, Louis Meyer, Chuck Ogilby, Jim Pokrandt, Ken Ransford, Dave Reinertson Clifton Water, Karn Stiegelmeier, Mike Wageck, Lane Wyatt, Bob Zanella

6. **Guests:** Steve Anders USGS, Ken Baker Upper Arkansas Water Conservancy District, Daniel Becker Town of Newcastle, Dan Ben-Horin Middle Colorado Watershed Council, Tyler Benton Wilson Water Group, Chelsea Brundige Public Counsel of the Rockies, Don Chaplin Bookcliff Conservation District, Stephan Chen SGM, Steve Child Pitkin County Com'r, Tyler Desiderio Applegate Group, Kelly Flenniken Xcel Energy, Angie Fowler SGM, Ryan Gordon SGM, David Graf, Hannah Holm-CMU, Erin Jaynes SGM, Brendon Langenhuizen SGM, Greg Lanning Town of Grand Junction, Lyle Layton City of Newcastle, Victor Lee BuRec, Ken Leib USGS, Bailey Leppek citizen, Heather Lewin Roaring Fork Conservancy, Holly Loff Middle Colorado Watershed Council, Ryan Loebach SGM, Anna Mauss CWCB, Alan Martellaro Division 5 Engineer, Seth Mason Lotic Hydrological, Ed Moyer Grand County, Brent Newman CWCB, Ed Okzewski and Stan Porter West Divide Water Conservancy District, Laurie Rink Middle Colorado Watershed Council, Richard Vangytenbeek Trout Unlimited.

7. **River Forecast. Flows at the Dotsero gage are 7,150 cfs, approaching the 75th percentile** flow of 7,540 cfs for May 23. The median flow on this date is 5,020 cfs. The Colorado River flow at the Cameo Gage above Palisade is 12,100 cfs, 2,660 cfs above the median flow of 9,440 cfs. The 75th percentile flow on May 23 is 14,700 cfs.

8. **Crystal River Management Plan Update.** Seth Mason, Lotic Hydrological, Carbondale. This plan was funded by the Colorado Basin roundtable; the full report is available at the Roaring Fork Conservancy's website. This plan started out as a study in Coal Basin, a tributary of the Crystal River, to monitor water quality from historic mining activity in Coal Basin into the Crystal River. **Over the past 30 years, the Crystal River has changed from an agricultural economy to one more reliant on tourism dollars**.

   a. **A lot of fishing and boating during runoff occurs on the Crystal River,** enhanced by panoramic views of Mt. Sopris. **The catalyst for this project was the low water year of 2012, when about a mile and a half of the river above Carbondale dried up**. It is flowing 900 cfs today and will likely peak this year at 2,000 cfs. As river flows drop, temperatures increase. Water depletion from agricultural irrigation diversions is the chief constraint. Lotic Hydrological was hired to determine **how much water is enough to make a difference in river temperatures, where water is needed most, and if there are practical engineering solutions** to improve this situation. They verified that **depletions from the river for agricultural irrigation constitute the chief constraint on the river**. The goal of the stream management plan was to identify management actions that could increase river flows. They did a functional assessment of the river to describe the river morphology, riparian attributes, and sediment and flow regimes at a watershed scale.

   b. **A water rights model was developed** indicating how water was moved out of the river, placed on a crop, evapotranspirated, and returned to the stream as surface or return flows. They **developed a 2-dimensional model of the lower Crystal River**, modeling the river **every 5 feet over an 8-mile stretch, resulting in 250,000 data points**. The river stretch from Thompson creek to the Fish Hatchery show the most degradation, particularly evident in August and September.

   c. **The model can change the hydrologic regime (that is, water flow)** and determine the effect on river flows. **In dry years the 7-day average flow is approximately 17 cfs, which is barely 1/3 of the recommended minimum flow of 50 cfs**. The study indicated that the river is water-short in every below-average scenario.

   d. A table of Functional Assessment Results indicated a lot of red (at risk conditions) below Thompson Creek. This table enables the working group to focus their attention on the parts of the river that are most at risk.

   e. They considered water leasing, ditch improvements, and in-channel changes to the river to determine if there are practical engineering solutions to the Crystal River. **In a 1 in 5-year drought, the river needs 7-12 cfs to meet minimum recommended flows, and in a 1 in 10-year drought the river needs 15-26 cfs to reach minimum flows**, which would require a 20% reduction in the water

presently being diverted from the river. Seth Mason's team **developed a contract between the Colorado Water Trust and ranchers to divert less during drought** years in return for payments to keep more water in the river. There appears to be **initial buy-in from hay farmers**. They **also** plan to work with the **Town of Carbondale** to recommend that they **line their ditches and reduce raw water deliveries to town residences during drought periods**.

f. Lessons learned: There is significant tension between the consultant who describes the river conditions resulting from river diversions and stakeholders who simply want a numerical prescriptive flow target to reach. There continue to be **administrative hurdles**, since there is no guarantee that **water left in the river** by one diverter will not be **swept by another river diverter**. That is, no one can guarantee that water left in the stream from a reduced diversion will remain in the stream. A project like this needs an organization with enough stature to implement the solutions.

g. Jim Pokrandt asked what comes next. **Seth Mason said the most promising step is to work on voluntary diversion reduction agreements with irrigators**.

h. How about **a dam on the Crystal?** The biggest hurdles are the **high cost** and determining **who will pay for it**.

9. **Kendig Reservoir feasibility study, Tyler Benton, Wilson Water Group**. The study cost $60,000. Proposed Kendig Reservoir is on West Divide Creek 15 miles south of Silt, and it is included as **a top project in the CBRT BIP**. The Colorado River District holds a **water right for 18,000 acre-feet with a 1957 appropriation date** in trust for the West Divide Water Conservancy.

a. **3 reservoir sites were investigated**. The service area lies between Mamm Creek and West Divide Creek. **Annual river flow is 26,000 acre-feet, ranging from 2,500 in dry years to 55,000 acre-feet** in wet years. Diversions into the reservoir would not be in priority during the irrigation season unless flows exceed 200 cfs (that is, **the reservoir can only capture "peak of the hydrograph" flows in May and June** when river flows exceed what hay farmers can put to beneficial use). The **average storable inflow is 10,000 af, compared to 19,800 af in the 25% wettest years, and 2,900 af in the 25% driest years**.

b. **The demands**:

Acre feet	% of use	Water use
200	2%	500 domestic wells
25 to 300	3%	Wells to drill for natural gas
10,000	**95%**	**6,700 acres of hay fields**
10,500	100%	

Water shortages average 10,000 acre-feet per year currently. In dry years, the shortage doubles to 20,000 acre-feet. **Other water demands include recreation**: Divide Creek could provide flat water boating, fishing, camping, and hydro-electric production.

c. **Dam benefits include carryover storage from wet to dry years**, and extra water to release when hay irrigators dry up the river (i.e., to re-time the annual streamflow). They could designate 1,500 af for augmentation, and **15,000 af as a supplemental irrigation pool**. It would **ensure that 4,200 acres would receive their full water need in 7 of 10 years.** In dry years, these fields would not receive their irrigation needs.

d. **A graph that simulated storage shows wide variation**. The proposed reservoir would be **dry during droughts in 1977, the late 1980s, and the early 2000s.** Three sites were looked at; the lower site would flood the area where the Highline Ditch now courses and cause it to be realigned. The upper site is no longer considered viable. A **middle alternate site** can provide gravity inflow into the Highline Ditch, but it **is located on Forest Service land** so it may require permitting for a **US Forest Service special use permit and 404 permits**. Tyler Benton said no fatal flaws were uncovered in the study.

e. **The project cost** is **$88 million at the lower site ($5,327 per af)** and $101 million at the alternate site ($6,121 per af) for a reservoir holding 16,500 af, or $65 million for a reservoir holding only 9,000 acre-feet ($7,200 per acre-foot). These costs are in line with other reservoirs constructed in the region. The lower site is completely on private land, so Forest Service permits are not required to build the reservoir there.

f. **In summary, a new dam would provide firm yield of 500 af augmentation water, and supplemental irrigation water for 4,200 acres** and help hay farmers receive their full water requirement in 7 of 10 years.

g. **Alan Martellaro** indicated that his office **administers the creek** (meaning that **senior users make calls** to prevent junior water right holders from diverting) and it may need to put another gage on the river. Martellaro indicated that Divide Creek carries trans-basin water.

10. **Grand Valley Water Users Association report on the Roller Dam study,** Mark Harris. The organization has been in existence since 1905. Mark is **asking $15,000 from the CBRT Basin WRA fund, and $285,000 from the CWCB Statewide WSRA to improve the canal just below the roller dam**. The GVWMP (Grand Valley Water Management Plan) starts at Palisade and goes to Badger wash 50 miles west. The roller dam and associated facilities supply water to the Grand Valley Power Plant, Orchard

Mesa, Palisade, and Mesa Irrigation associations. They are currently conducting a multi-million dollar canal lining project in the Palisade area.

a. Mark Harris emphasized that **the dam and the facilities** are a means to **protect the Cameo Call**.

b. **Top 5 projects:** Rehabilitate and **line the upper 500' of canal** directly below the roller dam, upgrade the electrical system, **rehabilitate the canal head-works, replace crumbling concrete** in the upper part of the diversion canals, and improve a concrete structure downstream that allows water to be released back into the river in the event of an emergency. **The total cost is $800,000**. The goal is to get more water through the upper canal to increase hydraulic capacity.

c. **Beneficiaries** – the water users; firm up pre-1922 Colorado River Compact rights; allow the full extent of call to be claimed; save about 40-50 cfs that is now lost when flows range from 1,850 to 2,250 cfs. **Agriculture is worth $80 million a year in the Grand Valley** surrounding Grand Junction. Harris said **"this enables innovative water use, perhaps water marketing, and other things we don't even understand."**

d. Steve Child pointed out that the ditch leaks into the Colorado River and supplements the 15-mile reach; if these leaks are fixed by lining the ditch, Steve asked how will this captured water be provided to the river? Mark said the leakage here is a safety concern.

11. **WSRA Funding Update, Brent Newman**. **British Petroleum** and other oil and gas producers were told they could not claim exemptions on their severance tax returns; the Colorado Supreme Court disagreed, so **$115 million is now owed to these companies. Future severance tax revenues will decline accordingly** (a reduction of about 12.5%), causing a corresponding reduction in roundtable funding. Previously, $10 million of severance tax proceeds were earmarked for WSRA grants. There's sufficient funding for the next year for the roundtables.

a. The **CBRT just received $120,000 for 2016, and $2.2 million was allocated to the statewide fund**, so there is money available for the upcoming September grant funding cycle. The CWCB board is proposing to allocate $10 million each year to WSRA funds, both to the roundtable and the statewide fund, and $5 million to the watershed restoration fund (compared to 2016 watershed restoration funding of $1.5 million). **The additional $10 million funding would be available next July 1, 2017.** Karn Stieglemeier asked where this would come from and Brent admitted it would come out of the CWCB construction fund.

12. CBRT Reserve Account Budget: The Next Steps committee reviewed our WSRA balance, and recommends that the roundtable hold funds in reserve, as follows:

Current balance	$353,327
Less: reserve for outreach and education	-20,000
Less: reserve for future endeavors	-100,000
Plus: $120,000 just received from CWCB	120,000
Equals: Available to grant	353,327
Less: Pending grants in May 2016	-81,750
Remaining WSRA funds available for future grants	$271,577

13. **Legacy Project proposal**. Louis Meyer and Ken Ransford recommended that **the CBRT roundtable promote a legacy project to improve irrigation delivery systems in an entire basin that would enhance agriculture and also benefit stream flows**. They recommend that the roundtable identify a region where all river diversions could be addressed, with an eye to improving irrigation delivery systems and improving stream health at the same time. The goal is to do **a demonstration project that water users in other river basins want to duplicate**.

    a. They recommend that the CBRT Roundtable **pro-actively identify a region** to focus our efforts and grant funds, **rather than responding piecemeal to grant requests** as they come in, many of which are already for irrigation system improvements.

    b. There are significant **legal barriers**, since there is **no guarantee that water left in the river would not be swept by other water right holders** including Front Range diverters.

    c. The cost of this could be **funded by a mill levy tax levied on all homeowners** in a sub-district, which is a geographical region that is part of a larger geographic district. The legislature just passed **SB 16-145** which permits the Colorado River District to raise taxes **from a sub-district for use solely within the sub-district.**

    d. The **NRCS makes money available** for irrigation system improvements, but to date these are primarily used **to reduce salts and selenium** in the Colorado River, which occur when flood irrigation water leaches through the Mancos shale into the water supply. While the NRCS is used to making grants to improve irrigation systems, they are **not yet focused on projects that increase instream flows**. Ken Ransford recommended that we enlist the aid of our US representatives to promote instream flows within the NRCS.

    e. Three policy objectives were recommended for further review by the CBRT roundtable:

        i. The **CBRT is a pro-active sponsor** of a legacy project.

ii. The CBRT funds **projects that benefit both agriculture and stream flows**.

iii. The **Colorado River District should play a central role**, from participating in the creation of a sub-district to administering the money collected and to supplementing it with money from its own grant program.

f. Jim Pokrandt said the next steps committee will take this up and report back to the roundtable.

14. Roundtable votes on grant requests

Project	**Requested**	**Approved**
East Mesa Ditch canal infrastructure repair.	$60,000	$30,000
Multi Trina ditch repair on North Thompson Ditch.	40,000	20,000
Ware & Hinds Ditch fish passage structure.	63,500	31,750
Shield o Mesa ditch improvement grant request was tabled for further review	-	-
Total	$163,500	$81,750

a. East Mesa Ditch: Karn Stieglemeier motioned, Chuck Ogilby seconded, to approve **East Mesa ditch** improvement project for $30,000, and it **passed unanimously**.

i. Chuck recommended that we increase the grant to $60,000 if the ditch company agrees they could leave 10-20 cfs in the creek; Jim Pokrandt recommended instead that the East Mesa ditch company bring this proposal to the Next Steps committee.

b. **Multi-Trina ditch improvement**: Stan Cazier motioned, Diane Johnson seconded to approve the Multi-Trina ditch improvement project near Silt for $20,000, and it **passed unanimously**.

c. **Fish passage structure** on the Ware and Hinds ditch– Richard Vangytenbeek will request the remaining $31,750 from the CWCB statewide grant reserve fund. Diane Johnson motioned to approve, Karn seconded, and it **passed unanimously**.

15. **Safe Drinking Water Presentation**, a review of the theme in the CBRT Basin Implementation Plan.

a. **Louis Meyer – What the BIP says**. There are over 60 water providers in the CBRT area, and SGM interviewed nearly all of them in preparing the Basin Implementation Plan. Each water provider funds and manages its own operations. There are **significant threats by 2050**, and many water providers are not looking out that far. The Basin Implementation Plan process is to create measurable outcomes, identify short term and long term needs, and methods to achieve those needs.

i. **Pursue multiple and redundant water supplies during extended droughts**. Most providers have met this, but **many are vulnerable** to droughts, for instance **providers that are located high in the headwaters** without dams to store water. They are at risk of running out in l**ow water droughts during the summer, or to having water supplies freeze in the winter**. In addition to increasing upstream reservoirs, the CBRT basin implementation plan recommends that we **increase conservation, promote efficient land use practices, and regional cooperation**.

ii. **Water providers should establish high conservation goals**. Often, water providers have little involvement with land planning decisions. The roundtable BIP recommends high conservation and that water providers work with land-approval agencies to solve future shortages.

iii. **Water providers should update water master plans beyond 2050** and address pending issues such as climate change or a Compact Call from the lower basin. Twenty years is not a long-enough planning horizon.

iv. **Water providers should aggressively pursue converting irrigation water rights senior to 1922 to municipal water rights**. Many water providers have municipal rights that are junior to the Compact Call.

v. **Water providers should require that developers dedicate 100% of the water associated with land proposed for development**. There is no uniformity in this area. Meyer recommends that **all water rights** associated with land to be developed should be **dedicated to the water provider, which can then lease it back** to golf courses, subdivisions, etc.

vi. **Water court process must be streamlined**. The opposition process is too cumbersome, that the CWCB or other water right holders will challenge instream flow rights.

vii. **Water providers should address aging infrastructure**. The American Society of Civil Engineers has **rated America's water infrastructure at a D**-grade. Flint, Michigan, is not the only place where this is a problem. Many of the nation's existing water delivery systems were installed in the

1940s and 1950s, and they are reaching the end of their useful lives. **Utilities are not reserving funds to improve infrastructure**.

16. **Four broad safe drinking water goals in the BIP**.

    a. **Future Water Supplies –** Develop in basin supplies and raw water sources that will be needed 30-40 years out. Develop cooperation between providers.

    b. **Education/Regulatory –** Raise awareness among the public of current obstacles facing water providers. **Educate the public about the true cost of water infrastructure.**

    c. **Focus on future threats –** protect drinking water supplies from f**orest fire, climate change, Compact Call**, etc.

    d. **Water quality** – Flint Michigan raised public awareness when it experienced a sharp increase in lead contamination when city pipes started drawing water from the Flint River instead of Lake Huron. **Most communities have source water protection programs** which limit human activities like mining or agriculture in places where cities get their water, **but they are not always enforced**.

        i. **Emerging contaminants**, which result from increasing pharmaceutical use and the proliferation of chemical synthetic products, is not something that water providers can deal with because their **water treatment systems are not designed to remove these elements**. The EPA and the Colorado Water Quantity and Quality Commission (WQQC) will likely end up regulating this, but increasing water supplies is likely the best antidote to increasing concentrations of these contaminants since testing for and removing them is very expensive.

        ii. The **main-stem Roaring Fork and many stretches of the Colorado River are on the Clean Water Act section 303(d) list**.

        iii. State health departments must submit to the EPA every two years a list of rivers where water quality standards are not being met. Impairment can occur if water temperature is exceeded, as occurs on Roaring Fork River. **Once a standard is exceeded, TMDLs must be established**, which stands for total daily maximum loads. These are **measures of the maximum allowable concentration of metals, E coli, pollutants, or dissolved solids** (typically salts) that can be present in the water. If a utility is discharging water that exceeds allowable levels, it may need to **develop a tertiary treatment facility to reduce discharged water to allowable levels**. Farmers can also be impacted.

17. **Municipal water supplies in headwater counties**. Longtime CBRT members Mike Wageck, manager of the Winter Park Water & Sanitation District (WSD), and Bruce Hutchins, manager for the Grand County WSD that covers areas outside of Winter Park's service area, discussed challenges they face in the Upper Colorado River Basin.

    a. **Denver Water has 23 collection points** where they capture water **from Fraser River tributaries** before they reach the Fraser River, which is then shunted through the Moffat Tunnel to Gross Reservoir above Boulder. Only 12 of Denver Water's diversions on the Fraser River have **bypass requirements**; together they **total 40 cfs in the summer and 18 cfs in the winter**. The remaining tributary diversions that do not have bypass flow requirements so they can be entirely dried up, such as Jim Creek. Denver Water reports that it takes the entire Jim Creek flow only 94% of the time, but Mike said it feels like it is happening all the time.

    b. **Winter Park, Fraser, and Granby rely on these bypass flows**. The Winter Park and Grand County WSDs get their water from source tributaries and from alluvial groundwater wells. Granby and the remaining cities downstream that withdraw surface water from the Colorado River must treat water containing effluent from waste-water plants before delivering it to citizens.

    c. **Denver Water**'s diversion on the Fraser River captures the entire river, but it **releases bypass flows of** 8-10 cfs in the summer, and **1-2 cfs in the winter, which is all the water that Winter Park has to live on** when its demands are the highest (Winter Park is the sixth busiest ski area in the country according to the National Ski Areas Association).[1]

    d. **Denver Water can reduce the bypass flows and divert even more water from the Fraser River if they put their customers on drought restrictions (such as every-other-day lawn watering)**, therefore reducing the flows that the Winter Park WSD relies on. This makes it difficult for the Winter Park water provider to plan since Winter Park needs bypass flows. Denver Water agreed in the Colorado River Cooperative Agreement (CRCA) not to reduce bypass flows until they fully prohibit outdoor watering in Denver. But **until Denver Water** gets its permit approved and **completes the Moffat Firming Project, Winter Park is subject to reduced bypass flows**.

    e. **Winter Park's water right from the Fraser River is .75 cfs**, a flow of water about 10" by 10."

    f. Denver Water used to flush sediment from **traction sand spread on icy Berthoud Pass roads** down the Fraser River, but that caused problems for Winter

[1] "America's Most-Visited Ski Resorts, downloaded Mar. 26, 2016, Travel + Leisure, http://www.travelandleisure.com/slideshows/americas-most-visited-ski-resorts.

Park. In 2006, **thanks in part to a CBRT WSRA grant, they cleared sand out the collection pond** that captures sand before sending it through the Moffat Tunnel, and hardened the bottom so they can now get in with a loader and haul out the traction sand. They removed 550 tons in 2016, about 60 dump truck loads, which has now solved the problem. This amounts to about 50% of the sand spread on roads.

g. Lane Wyatt asked if they have looked for reservoir sites; Wageck said the **only viable reservoir sites above Winter Park are in fens that the Forest Service will not grant permits to flood** since they are considered too valuable a resource.

h. The Winter Park ski area has its own water rights, and it also **uses about 15 acre-feet from Winter Park's water right for snow making**. Denver Water is funding water projects through the CRCA so the ski area can expand snowmaking instead of using the utility's water right.

i. What impact does increasing population on the Front Range have on Winter Park? **Denver has limited its service area, so growth there will go vertical** through infill, rather than sprawling outward. **But the CRCA allows Denver Water to enlarge Gross Reservoir from 44,000 to 117,000 acre-feet**. The water to fill Gross Reservoir will come from springtime runoff, and particularly during high water years. The bypass agreements they have with the Forest Service require Denver Water to release 1,000 acre-feet downstream as bypass flows, but the long-term impact of the Colorado River Cooperative Agreement will be to **flat-line the Fraser River so it always has below-average flows**.

18. **Eagle River Water & Sanitation District**, Diane Johnson. The water provider's service area is **Vail Pass to Wolcott**, serving Vail, Minturn, Eagle Vail, Avon, Beaver Creek, Edwards, Cordillera, and soon-to-be expanded Wolcott. They have **two small upstream reservoirs along the west side of Vail Pass (Black Lake and Black Lake No. 2) and Eagle Park Reservoir about 5 miles east of Tennessee Pass**, all of which are used for augmentation (i.e., to replace other senior water rights that the Eagle River WSD has taken out of priority). They get their water from groundwater wells or surface flows.

a. Most of **these towns are new**. On October 1, 1962, the Eagle River WSD was the first government entity created, 2 years before the town of Vail. **Six water districts** were created in and around Vail, and 1982 they merged into the Eagle River WSD. They have **redundancies** as a result. Pursuant to an **inter-governmental agreement**, the Upper Eagle Water Authority serves Avon to Edwards, and the Eagle River WSD serves Vail.

b. When molybdenum prices were low in the Climax Mine Company sold **Eagle Park Reservoir**, a tailings pond, 1998 to the Eagle River WSD after remediating the tailings. Vail Resorts is a majority 51% owner. The reservoir **releases 1 cfs down the East Fork of the Eagle River, and it joins Gore Creek at Dowd**

Junction along Interstate 70. The Eagle River WSD negotiated an **inter-connect pipeline** with Vail Resorts so that **water can be transported back and forth between Vail and communities further downstream**. This permits Vail to get water from the Eagle River for snowmaking and boosts water supplies available to the Eagle River WSD.

c. They have **3 small wastewater treatment plants that provide 3 points of return at Vail, Avon, and Edwards**; they must control nutrients at each site. Normally, the wastewater treatment plant is at the lowest point in a reach served by a utility; however, this is not possible since the I-70 towns are all located along the same river in a narrow valley. They almost never use the Gore Valley plant, which is on Gore Creek.

d. There are few lawns **in Vail**, and **municipal use is only 5% consumptive**, with 95% of municipal water use returning to the river. Vail gets its water from wells that are hydrologically connected to Gore Creek. **Treated water released back into Gore Creek is cleaner than the water that is already in the river**. The Eagle River WSD's next diversion takes water from the Eagle River for municipal delivery to Avon. Again, the water treated returned to the river is cleaner than the water already there. The Avon diversion point is only 25 yards upstream of the return flow from the Avon wastewater treatment plant, so there is no gap in the river according to the CWCB.

e. Outdoor water conservation is important. **During the 2012 drought**, Gore Creek was hurting more than the Eagle River. Normally the Eagle River WSD allows Eagle Park Reservoir water (51% owned by Vail Resorts) to flow down-valley after the ski season. However, **the Eagle River WSD uploaded it in the summer during the 2012 drought to Vail**, where it was used by customers there, primarily for indoor use. The treated return flows from the Vail wastewater treatment plant at Lionshead **enhancing streamflow in Gore Creek**.

f. There are **many river stretches on the 303(d) list and a lot of instream flow rights** that the Eagle River WSD must contend with.

19. Dave Reinertson, **Clifton Water** Assistant Manager in the Grand Valley.

a. **The Ute Water Conservancy District, the Town of Palisade, City of Grand Junction, and Clifton Water** are the four water providers in the Grand Valley, the area surrounding Grand Junction that is watered by irrigation projects mostly built with federal dollars. **Clifton Water serves 35,000 people now**, but it is projected to serve **85,000 to 100,000 people at full buildout**. Ute Water's source water comes from tributaries on the north side of Grand Mesa, and Grand Junction gets its water from the west and south sides of the Mesa. Clifton Water gets its water from the Colorado River and the Grand Valley Irrigation Canal.

The 1977 drought affected all 3 of these providers, so **they built pipes to connect their three systems which have been helpful in later droughts**.

b. Clifton Water's treatment plant can produce up to12 million gallons per day (mgd), of which 3 million are owed to the city of Grand Junction since they helped pay for the plant. Winter production is typically 2.5 mgd, rising to 4.7 mgd in the summer (the 2015 peak was 6.7 mgd, down from 9 mgd seven years ago).

c. **Reinertson attributes the reduction in use to new plumbing fixtures, higher water charges to customers, and more dense subdivisions** with less turf. Average daily use is 78 gallons per person per day, primarily from indoor use. **Supplemental outdoor irrigation serves 60% of their customers**, which means that Clifton Water's customers receive 40% of their outdoor water with treated water from Clifton Water's treatment plan. A Halliburton facility uses a lot of water, but not so much now due to low gas prices.

d. Clifton Water has **three water rights**: a **1912 right for 17 cfs in the Grand Valley Canal** taken from an intake in the canal, **and two 1959 rights for 15 and 5 cfs from the Colorado River** from an intake in the 15-mile reach between the Roller Dam and the Gunnison River confluence. Since Clifton Water's use was accommodated in the endangered fish Programmatic Biological Opinion, the utility can withdraw water without regard to its effect on endangered fish.

e. The plant **uses nano-filtration to remove salts** (typically referred to as dissolved solids). They remove silt in floc and settling basins, and add chlorine, fluoride, and a corrosion inhibitor to deal with lead. They **remove mud twice a year** from the settling ponds by mixing it into slurry and depositing it onto 140 acres where it dries for later disposal. The Colorado River intake is gravity fed in the summer due to higher river flows, but they must pump water from the river in the winter when flows are lower. The Grand Valley Irrigation Canal is shut off in the winter, so no water is available from that source. They **no longer use sand filters**, but **now use more advanced membrane filtration systems**.

f. Inter-agency cooperation. The 2002 drought prompted a response plan for Grand Valley, where the four water providers agreed that **if one provider has a problem, that all have a problem**. All 3 providers agreed to raise their rates 5 times to cut back water use. Their respected **DRIP water education program enhances the public's drought consciousness**. It was the first municipal water conservation plan approved by the CWCB. They have **one water conservation plan that all citizens participate in**. Two entities were not in favor of toilet rebates while one was, so they negotiated a solution.

g. Water providers know that **when you say drought, water use goes up** because people use more in advance of being cut back. Reinertson attributes the increased water use in the 2012 drought due to this.

h. There are **dozens if not hundreds of sewage effluent discharging points upstream of Clifton**, including Palisade which received an exemption to discharge more highly polluted water. **Every railroad or truck crash** that discharges chemicals into the river means that **Clifton Water has to let water go by** the treatment plant until it is diluted enough to withdraw. With their **new membrane treatment plant,** Reinertson says that Clifton Water **could have even treated** water contaminated by the 2015 Gold King mine spill down **the Animas River** for human consumption.

i. Clifton Water has treated water rated as high as **85,000 NTU** (nephelometric turbidity, a measurement of the light that passes through **muddy water**); it reflects how much silt is in the water. When there are rainstorms, NTU typically peaks around 3,000. The settling ponds capture about 90% of the NTU.

j. Reinertson says that **pharmaceuticals being flushed down the river** is a problem that is only going to get worse. Many water providers say **one solution for pollution is dilution**. At high flows, dissolved solids in the river peak at 100 milligrams/liter; with lower winter flows, salts are eight times higher, at times exceeding 800 mg/l. Every **trans-mountain diversion** to the East slope will only **make this problem worse**.

k. It costs Clifton Water $2 to treat 1,000 gallons in the membrane plant, primarily to pay for power and chemicals. They **know exactly when something has happened to introduce pollution upriver because it increases their costs**.

l. **Ute Water** does not have this sophisticated treatment, but since they purchased **Ruedi Reservoir water**, they will eventually have to take from the river. Thus, they **will have to build a treatment facility similar** to Clifton Water's in the future.