



**Cherry Creek Basin Water Quality Authority
Technical Advisory Committee Meeting Agenda
Thursday, August 3, 2023, 9:00 a.m.**

**In-Person: SEMSWA
7437 S. Fairplay St.
Centennial, CO 80112**

**Virtual: Zoom¹
<https://us06web.zoom.us/j/87425775963> Passcode: CCBWQA
Phone (646)931-3860 Mtg ID: 874 2577 5963# Passcode: 815374**

TAC Meeting Documents can be found online at the link below.

<https://drive.google.com/drive/folders/12BoEhmFbnnMCxivnpjY2l7T5TzP8Azlq?usp=sharing>

1. Call to Order (9:00) (5 minutes)
2. Meeting Minutes from July 6, 2023 (enclosed)
3. Highlights from the July 20, 2023 Board Meeting (Clary) (9:05) (5 minutes)
4. Action Items (9:10) (5 minutes)
 - a. Cherry Creek Reservoir to Lake View Drive Alternatives Analysis TAC Subcommittee Request (Borchardt, enclosed)
5. Discussion Items (9:15) (90 minutes)
 - a. Lone Tree, Windmill and Cottonwood Master Plan Alternatives (Maggie Lewis, enclosed with attachment linked in [Google Drive](#)) (30 minutes)
 - b. Site Specific Standards Approach and Next Steps (Christine Hawley) (1 hour)
6. Presentations (none)
7. Updates (10:45) (15 minutes)
 - a. Cherry Creek Stewardship Partners (Davenhill)
 - b. TAC Members
 - c. TAC Subcommittees
 - i. Modeling Subcommittee (Leak/Clary)
 - ii. Watershed Plan Subcommittee
 - d. Contractors
 - i. [Water Quality Update](#) (Stewart)
 - ii. Pollution Abatement Projects (Borchardt, enclosed)
 - a. CIP Status Report
 - b. Partner Coordination on 2024 to 2033 CIP
 - iii. In-Park PRF and RDS Maintenance and Operations Report (Goncalves, enclosed)
 - a. [May](#) and [June](#) Flood Damage Reports (enclosed)
 - iv. Regulatory (DiToro)
 - a. Regulation 86
 - v. [Land Use Referral Tracking](#) (Endyk)
 - e. Manager (Clary)
8. Upcoming Events
 - a. 25th Annual Cherry Creek Watershed Conference - August 24, 2023 - PACE Center, Parker
 - b. Watershed Plan Process Workshop - September 21, 2023 - 8:30-11:30 am
9. Adjournment

¹ If you are unable to participate on the CCBWQA's Zoom platform, please email val.endyk@ccbwwqa.org



**Cherry Creek Basin Water Quality Authority
Technical Advisory Committee Meeting Agenda
Thursday, July 6, 2023, 9:00 a.m.**

TAC Members Present

Alex Mestdagh, Town of Parker
Caitlin Gappa, Douglas County Health Department (zoom)
David Van Dellen, Town of Castle Rock
Gene Seagle, US Army Corps of Engineers (zoom)
Jacob James, City of Lone Tree
James Linden, SEMSWA - Alternate
Jeremiah Unger, CDOT
Jessica La Pierre, City of Aurora
Jim Watt, Board Appointee, Mile High Flood District (zoom)
Joseph Marencik, City of Castle Pines
Jon Erickson, TAC Chair, Board Appointee, Colorado Parks and Wildlife
Larry Butterfield, Board Appointee, Cherry Creek State Park
Lily Montesano, Wright Water Engineers, Representing City of Greenwood Village
Lisa Knerr, TAC Vice Chair, Arapahoe County (zoom)
Marty Easter, Arapahoe County Public Health - Alternate (zoom)
Rebecca Tejada, Board Appointee, Special Districts, Parker Water and Sanitation District (zoom)
Rick Goncalves, Board Appointee
Ryan Adrian, Douglas County (zoom)
Steve Chevalier, Arapahoe County Public Health

Board Members Present

Bill Ruzzo, Assistant Secretary, Governor's Appointee
John Woodling, Governor's Appointee
Tom Downing, Governor's Appointee (zoom)

Others Present

Alan Leak, RESPEC
Christine Hawley, Hydros Consulting (zoom)
Erin Stewart, LRE Water
Jane Clary, Wright Water Engineers, CCBWQA Technical Manager
Jessica DiToro, LRE Water
Richard Borchardt, R2R Engineers

1. Call to Order

Jon Erickson called the meeting to order at 9:00 am.

2. Meeting Minutes from June 1, 2023

Jeremiah Unger moved to approve the June 1, 2023 meeting minutes. Seconded by Jacob James. The motion carried.

3. Highlights from the June 15, 2023 Board Meeting

Jane Clary provided an update on actions taken at the June 15, 2023 Board meeting. Minutes from the meeting can be found [here](#). The meeting included approval of the 2022 audit, presentation of the MS4 Annual Report, and emerging technologies for P removal. She also provided an update on the Partners field trip to Cherry Creek and Piney Creek and that there was Board interest in the WOTUS updates. Jane put together a [folder](#) of comment letters and a WWE memo regarding gap waters policy.

4. Discussion Items

a. Initial [Progress Update on Site Specific Standards](#)

Christine Hawley with Hydros Consulting provided an update on the site-specific standards progress with analysis and development of a site-specific standard (SSS) for CCR. See her presentation (linked above) for topics discussed at the meeting. The initial evaluation showed that CCBWQA's data set will support this effort and that CDPHE's Sechi-depth based approach is not a good fit for Cherry Creek Reservoir. Christine will present a detailed analysis with recommended next steps at the August TAC meeting.

b. Lone Tree, Windmill, and Cottonwood Creek Master Plan Progress

Jane Clary presented an update on the progress of the Lone Tree, Windmill, and Cottonwood Creek Master planning efforts and provided a [Map with Descriptions](#) and [Photos](#) within the State Park that includes an alternatives analysis - do nothing or complete improvements. Pictures include Lone Tree Pond post 2023 storm events. Although the main embankment is still intact, the outlet screen is missing, pipes clogged, erosion is occurring downstream of the pond. There are likely water quality impacts so assessment of alternatives will include input from the public and state park.

Recommendation to have WWE provide a project update at the next TAC meeting and form a subcommittee if needed.

c. General Approach to [Watershed Plan Update](#)

Jane Clary presented an update on the general direction of the Watershed Plan work and the subcommittee.

Discussion included:

- [2012 Watershed Plan](#) has lots of good information and can be used as an outline to start planning updates.
- 208 Planning vs. Management Agency question remains. CCBWQA is not a 208 planning agency but can include procedures and roles as a review agency on 208 topics (such as site applications) in the updated Watershed Plan. CDPHE also has 208 duties divided. Would be beneficial to review Reg 22 requirements (bridges gaps between federal 208 requirements and state specific).
- Strategic Planning - Vision/Mission/Goals/Objectives were revisited in January by staff/TAC and Board leadership and will only need minor updates.
- Control Reg 72 section updates can be included.

5. Presentations

a. [June Storm Damage](#)

Erin Stewart presented data summarizing the significant rainfall event in the end of June of 2023 (6/22/23), and photos showing the aftermath at various locations and monitoring sites.

6. Updates

a. Cherry Creek Stewardship Partners (Davenhill)

Jane Clary provided an update on behalf of Casey Davenhill stating that the annual conference is scheduled for August 24th at the PACE Center in Parker. The agenda will be ready with registration open next week.

b. TAC Members

- Jon Erickson informed the TAC that CPW water rights administrator Ed Perkins recently retired.
- Steve Chevalier informed the TAC that Arapahoe County Public Health is updating their Community Health Assessment to help understand the current health needs and assets of the County and its

residents. ACPH is requesting CCBWQA TAC members who work in Arapahoe County provide feedback by responding to the survey linked [here](#). Responses to the survey will help inform the 2023 Community Health Assessment and Community Health Improvement Plan.

c. TAC Subcommittees

i. Modeling Subcommittee (Leak/Clary)

Alan scheduled a meeting with WWTP providers and will report back to the subcommittee with information.

ii. Watershed Plan Subcommittee (see above)

d. Contractors

i. [Water Quality Update](#) (Stewart)

ii. Pollution Abatement Projects - [CIP Status Report](#)

Rich Borchardt provided highlights on his CIP Status Report.

- Happy Canyon upstream of I-25 has been affected by wet weather from mid-May through June so construction schedule has been delayed ~ 6 weeks as a result of weather.
- The Dove Creek project construction is nearing completion and was mostly completed before the June storm hit; the native grasses are already coming in and growing well with all the moisture.
- For the Cherry Creek from the Reservoir to Lake View Drive project, a project coordination meeting was held with Aurora and they are interested in partnering; coordination with MHFD's capital improvement program and budgeting has begun with potential funding in 4 to 5 years.

iii. In-Park PRF and RDS Maintenance and Operations Report (Goncalves)

Rick provided an update that the RDS system was operating as designed during inspection on 7/5, although a few lines have been snagged by anchors.

In-Park PRF Inspections are normally scheduled during the end of summer or following any storm events >1"/hr. After the May storm, it took a while for water to recede so inspections could be completed. After the June storm, Cottonwood Creek was running full, water running across Lakeview. No damage to PRF identified to date, but ongoing inspections will continue as water levels decrease.

iv. Regulatory (DiToro)

Jessica provided an update on the CR72 Stakeholder meeting that she attended in June. The next meeting will be in August and Jane will be attending. At this next meeting Parker Water and San. District/Castle Rock will present more of the technical aspect of their proposal, including supporting data and analyses.

v. [Land Use Referral Tracking](#)

Jeremiah stated that CDOT standard practice moving forward will be to request a formal review of all LURs.

e. Manager

7. Upcoming Events

- 25th Annual Cherry Creek Watershed Conference - August 24, 2023 - PACE Center, Parker**
- Watershed Plan Process Workshop - September 21, 2023 - 8:30-11:30 am**

8. Adjournment

Jon Erickson adjourned the meeting at 10:52 am.



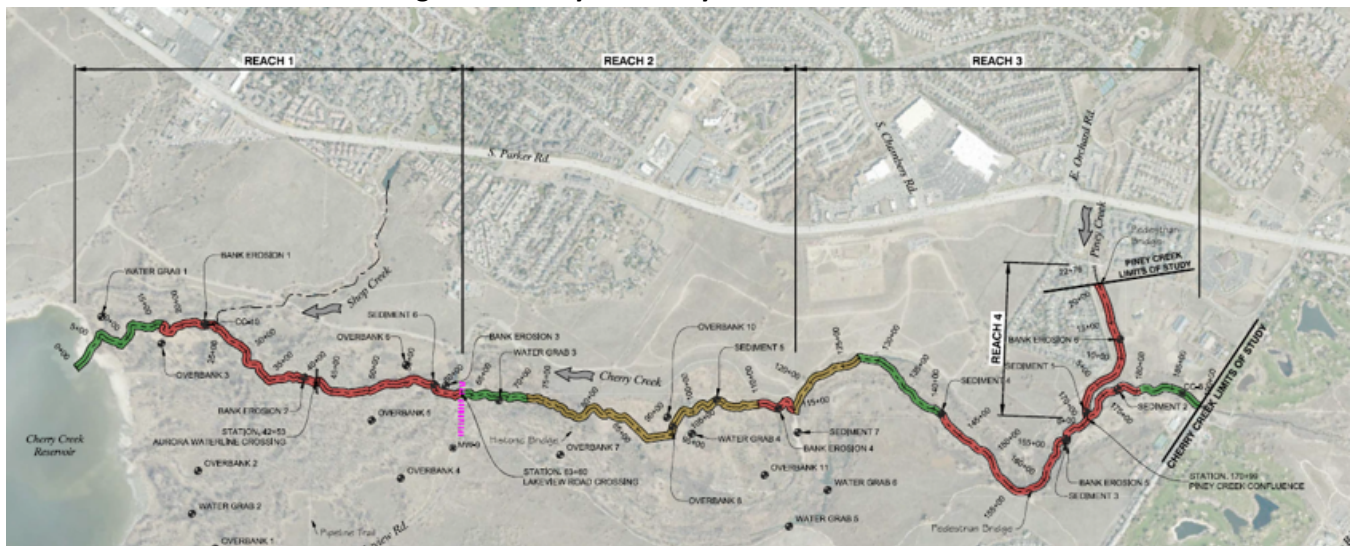
ACTION ITEM MEMORANDUM

To: CCBWQA Technical Advisory Committee (TAC)
From: Richard Borchardt, Pollution Abatement Project Manager
Date: August 3, 2023
Subject: TAC sub-committee for Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1)

Request: The TAC create a TAC sub-committee to provide feedback to Muller and report to the TAC on the Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1).

Project: In April 2023, the TAC recommended and the Board authorized Muller to perform the Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1, see **Figure 1**).

Figure 1. Cherry and Piney Creeks within CCSP



Muller prepared the attached schedule which includes 3 progress, 1 TAC, and 1 Board meeting. It is anticipated that Progress Meetings 2 and 3 will include all partners and additional feedback may be needed from TAC. To provide timely feedback, a TAC sub-committee is suggested. The TAC sub-committee would attend the progress meetings 2 and 3, review any submittals, report to TAC, and provide feedback to Muller as needed. It is recommended, at a minimum, the TAC member from any potential partnering agencies would be included (i.e., Aurora, Colorado Parks and Wildlife, and Mile High Flood District). Any other TAC members would be welcome. The TAC sub-committee would work with CCBWQA consultants Rich Borchardt and Jane Clary and CCBWQA executive committee member Bill Ruzzo. The anticipated time commitment for TAC sub-committee members would be about 8 hours (4 hours for progress meetings 2 and 3; 3 hours to review alternatives/costs/water quality analysis; and 1 hour for TAC coordination).

Budget: N/A – no cost is anticipated for TAC sub-committee

Motion: I move to create a TAC sub-committee to support the Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive project.

WWE
MEMORANDUM

To: CCBWQA Technical Advisory Committee
William P. Ruzzo, P.E., CCBWQA Executive Committee
Via email

From: Wright Water Engineers, Inc.
Maggie Lewis, P.E.
Andrew Earles, P.E., Ph.D., D. WRE

Date: July 28, 2023

Re: CCSP Lone Tree, Windmill, and Cottonwood Creeks Master Plan – Summary of Draft Alternatives

INTRODUCTION

Wright Water Engineers, Inc. (WWE) has prepared this memorandum to summarize the results of work to identify project alternatives for the Lone Tree, Windmill, and Cottonwood (LWC) Creek watersheds in the Cherry Creek State Park (CCSP). The subject creeks pass through CCSP property prior to entering the Cherry Creek Reservoir. This memorandum provides information to supplement the on-line Technical Advisory Committee (TAC) meeting of the Cherry Creek Basin Water Quality Authority (CCBWQA) regarding this master plan to be held on August 3, 2023. The intent of this memorandum and this meeting is to update the TAC on progress and present a draft of potential master planning alternatives for consideration.

BACKGROUND

Study Watersheds

The three study watersheds shown in the Attachment 1 figure generally drain from south to north to the Cherry Creek Reservoir through CCSP. The Cottonwood Creek watershed extends approximately 8.7 miles from its upstream limit in the City of Lone Tree to its downstream limit north of Belleview Avenue in CCSP where it flows into the Cherry Creek Reservoir. The Cottonwood Creek watershed is generally 1.4 to 1.7 miles wide along most of its length and corresponds to the Mile High Flood District (MHFD) Project Reuse Watershed #4602. It has a drainage area of 8.1 square miles when it enters the park and 14.2 square miles when it reaches the reservoir, including the Lone Tree and Windmill Creek tributaries. The highest point in the watershed is approximately 6320 feet above Mean Sea Level (MSL). The lowest point in the project area, at the confluence with Lone Tree Creek, is at 5588 MSL. Cottonwood Creek drops 732 feet between these two points over a stream length of 10.0 miles, producing an average slope of 1.4% for the full watershed length and just 0.4% in CCSP. At various portions of the watershed Cottonwood Creek watershed is under the jurisdiction of Colorado Parks and Wildlife (and the U.S. Army Corps of Engineers), Arapahoe County, Greenwood Village,

the City of Centennial, the City of Lone Tree, and Douglas County. A large portion of the stormwater in this watershed is managed by the Southeast Metro Stormwater Authority (SEMSWA).

Lone Tree Creek is a right bank tributary to Cottonwood Creek, and Windmill Creek is a right bank tributary to Lone Tree Creek. Both creeks generally flow in a northerly direction towards CCSP. The two watersheds encompass 4.9 square miles. Of these 4.9 square miles, 1.6 square miles are located within the Lone Tree Creek watershed and 3.3 square miles are located within the Windmill Creek watershed. Elevations within the Lone Tree Creek and Windmill Creek watersheds range from approximately 5,900 to 5,600 feet above MSL, both with an average watershed slope inside and outside CCSP of 1.1-1.2%. The Lone Tree Creek and Windmill Creek watersheds are located within Arapahoe County, Douglas County, the City of Centennial, and the City of Aurora. In general, the basins are bound by Cherry Creek and CCSP to the north, Cottonwood Creek to the west, Cherry Creek and Dove Creek to the east, and the E-470 Tollway to the south. Most of the area of these watersheds is located within the SEMSWA service area. Lone Tree Creek and Windmill Creek correspond to MHFD Project Reuse Watersheds #4603 and #4604, respectively.

Due to the historical use of this area in early twentieth century agriculture, there are a number of areas where the stream alignments were previously diverted and split. These are evident in part by the multiple alignments that can be found in all three waterways and are shown in the Attachment 1 figure. For Cottonwood Creek, there is a split flow location upstream of the 2011 stream reclamation project. The 2011 reclaimed western alignment moved the creek to the valley floor as best as could be defined as supported by Google Earth 1937 aerial photography. Cottonwood Creek also has a previously diverted eastern alignment that flows through the Family Shooting Range and was blocked via an earthen berm in 2011. This earthen berm allows for most of the baseflow and flood flows to stay in the reclaimed western alignment. However, the eastern alignment continues to convey a small amount of direct runoff and groundwater.

For both Lone Tree and Windmill Creek, it is unclear which alignment was formed prior to the historical agricultural diversions. In Lone Tree Creek the base flow and more frequent storm events currently flow to the Lone Tree Creek Pond via its western alignment, while the larger storm events flow to both the western and the eastern alignments. The eastern alignment is shown in Attachment 1 and flows towards a confluence with Windmill Creek and the Lone Tree Creek eastern culvert crossing of the Caretaker Road. For Windmill Creek the eastern alignment is blocked by the Caretaker Road and flows west via a roadside ditch to a culvert crossing along its western alignment. These culvert crossings are described below in the “Field Assessment” section of this memorandum.

Other Studies & Reports

This master plan is intended to accompany a MHFD Major Drainageway Plan (MDP) that is currently in progress in the upstream SEMSWA service area for the Lone Tree, Windmill, Dove, and Cottonwood Creek watersheds. The hydrologic modeling conducted for the MHFD MDP can be extended down into the CCSP with some relatively minor updates to the models. This will allow for an integrated plan for these creeks from upper watershed areas in SEMSWA’s jurisdiction to downstream limits in the park. WVE is currently working on the upstream MDP with a goal of completion by the end of 2023. The CCSP master plan will be incorporated into the overall MDP.

Updated information for the development of the alternatives was derived from the following engineering reports:

- ICON's 95% design for the Lone Tree Creek Trail Phase II stream improvements (ICON 2022).
- Hydrologic study by SEMSWA for all three watersheds (WWE 2020), upstream of CCSP.
- Project history documents in CCBWQA's archives.
- Documents regarding the 2011 Cottonwood Creek Stream Reclamation project.
- ICON Engineering, 2022. Drainage Report – Phase 3 Lone Tree Creek Trail Phase II and Stream Improvements. Prepared for Centennial, CO.
- R2R Engineers, 2022. Action Item Memorandum to the CCBWQA Technical Advisory Committee Regarding Intergovernmental Agreement for the Lone Tree Creek Trail. July 7, 2022.

Attachment 2 includes a summary of findings and excerpts from documents that can be used to support the CCBWQA TAC's and Board's decision-making processes.

METHODS USED

Field Assessment

This section provides a summary of field observations to date with supporting photos in Attachment 3. At the time of this memorandum, there are only a few remaining portions of the study area left to walk on the main stem of Cottonwood Creek. Because water levels remain high from the heavy rainfall this spring and early summer, WWE will need to conduct an additional site visit after water levels drop to assess portions of Cottonwood Creek in CCSP that were previously restored to see if there have been any damages that have occurred in these areas that need to be included in the master plan for repair.

On April 28, 2023, WWE staff walked Windmill Creek and Lone Tree Creek within CCSP. WWE staff met with the park manager Jason Trujillo prior to the April site visit. He provided history and context to some of the "focus" areas previously highlighted by the CCWBQA. He also highlighted the issues with frequent maintenance and overtopping of the Cottonwood Creek channel through the Family Shooting Range. The spring and early summer months leading up to the site visit were really wet, and there was rain the few days prior. The Caretaker Road had several inches of standing water east of the Windmill Creek crossing (Photo 1). Staff identified an overflow path along the Caretaker Road for Windmill Creek shown in the figure in Attachment 1. The standing water and overflow path can be attributed to rain gage information showing approximately 1.0 inch of rain in the 72 hours prior to the site visit and 0.7 inches in the 24 preceding hours. Windmill Creek was not well defined immediately upstream of the Caretaker Road. The channel is very well defined upstream of the confluence with its tributary from the outfall SEMSWA Pond W-8 (Photo 2). No erosional areas were noted in this reach. Windmill Creek and the eastern alignment of Lone Tree Creek currently cross the Caretaker Road via two culvert crossings (Photos 3 and 4, respectively) approximately 180 feet from one another with a confluence north of the road. The western Lone Tree Creek alignment crosses the Caretaker Road approximately 780 feet west of its eastern alignment culvert crossing.

The portion of Lone Tree Creek just upstream of CCSP is in the City of Centennial and the SEMSWA service area. An Arapahoe County Wastewater Authority (ACWWA) wastewater treatment outfall discharges to Lone Tree Creek within CCSP. The wastewater effluent provides a reliable source of baseflow for Lone Tree Creek that is valuable for the corridor. The stream is significantly degraded downstream of the ACWWA outfall, and a stream reclamation project is currently at a 95% design level by ICON engineering. The stream reclamation improvements for Lone Tree Creek end well upstream of the split flow path for Lone Tree Creek shown in the Attachment 1 figure. This split flow area takes almost all of the baseflow and more frequent storm events to the Lone Tree Creek Pond via the western alignment. There were many areas of overflow through the wetland complex from the eastern alignment up to 200 feet downstream of the split flow path (Photo 5).

Downstream from the Caretaker Road, the primary flows in Lone Tree Creek have been diverted to a relic pond (Photo 6) that is referred to as Lone Tree Creek Pond in this memorandum. In the early 2000s, ACWWA completed work on this existing pond to improve the outlet structure and create a grouted boulder rundown chute for the spillway (Photo 7). The outlet is not designed for water quality purposes and appears to be significantly clogged. The pond likely provides some incidental water quality benefits and provides habitat supporting passive recreational benefits (e.g., bird watching). Given the size of the pond relative to the size of the watershed, this pond is unlikely to provide significant water quality benefits and could not be retrofit to meet MHFD criteria for an extended detention basin, constructed wetland basin, or retention pond without substantial and costly modifications. The creek loses considerable elevation from the spillway elevation in the pond to the creek below. The grouted boulder rundown that was constructed to provide stable conveyance in this area has been undercut and has collapsed into the creek. There is significant channel erosion downstream from the failed spillway for at least several hundred feet. This is probably the most critical location in the study area to repair in terms of ongoing erosion that may affect the reservoir. The situation with the grouted boulder chute is likely to worsen if repairs are not completed. Repair timeline and likelihood of failure were not assessed as part of this field work, although it is not believed that the pond embankment is at immediate risk of failure yet. Nonetheless, it is only a matter of time for the spillway failure to progress to a point that the pond embankment would be compromised.

Downstream of the rundown failure, Lone Tree Creek is incised for at least several hundred feet. Several hundred feet further downstream, the channel is in better condition and does not exhibit signs of significant bank erosion (Photo 8). It also appears that the channel and the floodplain are better connected (including a wetland complex with open water, Photo 9) for the reach of stream that flows from the confluence of Windmill and Lone Tree Creek to the confluence with Cottonwood Creek. Based on field observations, it is likely that few improvements, if any, are needed for this reach.

There is a large wetland complex at the confluence of Lone Tree Creek and Cottonwood Creek approximately a quarter mile downstream of the Lone Tree Creek Pond. This was constructed in 2011 as a part of the stream reclamation project in Cottonwood Creek. Another quarter mile downstream of the confluence there is an earthen berm that appears to be preventing channel flow from entering the old artificial stream path through the Family Shooting Center and behind the

shooting range. Staff at the shooting range have reported large amounts of water after storm events and that lead mitigation is sometimes performed in the debris fall zone. The artificial channel flows through this debris fall zone with the surface of the banks primarily covered in shotgun shells (Photo 10). There is no vegetation in this area due to the need for a clear sight line for shooting purposes. At the time of the site visit on July 11, 2023, there was about six to twelve inches of baseflow in the channel through the debris zone. About half a mile downstream of the shooting center, the eastern and western channel alignment merge north of the Cottonwood Creek Trail crossing. This is also the downstream limit of the 2011 stream reclamation project. Cottonwood Creek continues downstream through stable wetland areas to the Cherry Creek Reservoir.

WWE also visited a portion of Cottonwood Creek where vegetation harvesting is taking place. We observed some beaver activity in this area, a little upstream from the area that was harvested. Overall, many improvements have been implemented to Cottonwood Creek through the State Park. These improvements include the installation of pollutant reduction facilities (PRFs) including wetland complexes and stream riffles. WWE staff visited some of these facilities on July 19, 2023, with Rick Goncalves, P.E. of RG Engineers during post-storm PRF inspections. For the areas visited, the channel did not show significant damage from the spring flood events (Photo 11). The water was still at a high enough level so that some of the features could not be fully seen and will be revisited by RG Engineers in the latter summer or fall.

Hydrologic Modeling

The starting points for updating hydrology for the three study watersheds were the most recent master plans and models completed for these watersheds by CCBWQA, MHFD, SEMSWA and other nearby entities. This master plan updates a hydrologic analysis that was reviewed and approved in 2020 by the MHFD. Relevant excerpts are included in Attachment 2. As part of that hydrologic analysis, WWE used National Oceanic and Atmospheric Association (NOAA) Atlas 14 precipitation data, the 2016 recalibration of the Colorado Urban Runoff Procedure (CUHP) by the MHFD, and the United States Environmental Protection Agency (USEPA) Stormwater Management Model (SWMM) Version 5.1.014. Future imperviousness values were provided by SEMSWA to reflect full development in urbanized areas. The purpose of this study was to update the hydrology for these watersheds based on:

- Updated rainfall data from the NOAA Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 8 (Perica et al. 2013). This is the current rainfall data recommended by the MHFD in the Urban Storm Drainage Criteria Manual (USDCM) and is based on a longer period of record than the NOAA Atlas 2 based data used in previous planning efforts.
- The latest version of CUHP, which is CUHP 2005 2.0.0 (MHFD 2017). This version of CUHP was the result of a recalibration by the MHFD to attain better agreement between modeled and observed flows.
- Updated information on drainage areas for basins within CCSP based on the Denver Regional Council of Governments (DRCOG) geographic information system (GIS) data.

- Updated information on drainage areas for basins within the study area based on the DRCOG GIS data.
- Incorporation of upstream water quality and flood attenuation facilities owned and maintained by SEMSWA in the SWMM model.

The work has produced updated tables and mapping, showing peak flows for design events, and detention pond inflow and outflow hydrographs at key locations in the three study watersheds. Because this study is an update to relatively current master plans, it is streamlined and focused on the results of the hydrologic analyses within the CCSP. Results will be included in the final report since field work is ongoing to quantify flow splits. The master planning studies referenced provide excellent background information on each of these watersheds and should be referenced for additional information on upstream areas.

ALTERNATIVES IN CHERRY CREEK STATE PARK

WWE has identified alternatives for six focus areas in the study area. These are shown in Table 1 followed by additional discussion of each focus area.

Table 1. Focus Areas and Alternatives

Focus Area	Alternatives
1. Lone Tree Creek Pond	Do nothing.
	Drain pond and convert to wetland area without ponded water or remove entirely and restore channel through area.
	Repair outlet, embankment and spillway and keep pond; water rights likely required.
2. Lone Tree Creek Pond Outfall Channel	Do nothing.
	Raise channel invert to level prior to spillway failure and stabilize.
	Add drop structures to create stable outfall channel from end of spillway to natural channel grade downstream of eroded channel section.
3. Lone Tree Creek Split Flow	Do nothing.
	Divert flows from western to eastern Lone Tree Creek alignment.
4. Caretaker Road Crossing	Do nothing.
	Upsize culvert and armor against erosion per ICON design.
	Revisit ICON design if upstream Lone Tree Creek split flow is modified.
5. Cottonwood Creek Eastern Alignment at Family Shooting Range	Do nothing.
	Pipe channel through shotgun-lead, debris zone.

1. Lone Tree Creek Pond

Continued erosion from Lone Tree Creek is a top priority and should be minimized to protect PRFs and conditions in Cottonwood Creek. A major source of this erosion is the eroding spillway channel at the Lone Tree Creek Pond outfall. Alternatives in this location can generally be split into two options: draining or keeping the pond. A proposed project for the former could be draining the pond and converting it into a wetland area without ponded water which could continue to provide some ecological benefits, while obviating or minimizing the need for water rights. Depending on how this is done, some of these modifications could also help to manage the elevation drop coming out of the pond. However, if the pond is retained for ecological and recreational reasons, then CCBWQA and CCSP will need to further review water rights needs and options. The outlet structure, spillway, embankment, and receiving channel would also need repair. A method of energy dissipation such as a stilling basin at the large scour hole that has formed at the bottom likely would make sense.

Whether this pond is retained in the current configuration (with spillway improvements and water rights) or converted to a feature that does not retain water, maintenance access should be improved. This could potentially allow for harvesting of fringe wetland vegetation around the pond or dredging of accumulated sediment, which could benefit the water quality of the reservoir and help to minimize occurrence of nuisance conditions with algae blooms and odors associated with the pond.

2. Lone Tree Creek Pond Outfall Channel

Closely related to #1, the Lone Tree Creek Pond outfall channel is also considered for repairs that either maintain the current invert or restore the previously raised invert. Both alternatives would require new drop structures somewhere along the channel. Keeping the current invert and the pond outfall would mean that the drop structure could be incorporated into the outfall. Complete embankment removal would also pair well with maintaining the current invert, although the project scale would be significantly reduced. If the pond is removed, the channel running through this area will need to be restored. These alternatives will be further explored in the final report once the primary concern as to whether or not the pond will be kept is addressed.

3. Lone Tree Creek Split Flow

Some of the hydraulic loading on the Lone Tree Creek Pond outfall could potentially be lessened through a modification to the upstream Lone Tree Creek split flow area. This would shift some of the flows from the western alignment of Lone Tree Creek to the eastern crossing of the Caretaker Road. Based on 2-D modeling by ICON, it looks like this is already happening to some degree. This could provide a more impactful result on lessening the load on the pond but would require significant grading and wetlands impacts. Nearly all the baseflow and most of the flood flow currently are directed to the pond. This occurs via a split flow location approximately 1000 feet upstream of the Caretaker Road. There is also significant shallow overflow from the eastern back to the western Lone Tree Creek alignment through the wetland complex downstream of the split flow location. This is evident due to over a dozen small overland flow paths in the wetland area. The estimated total width

of this overflow path network is approximately 200 feet which may mean significant wetlands impacts if this alternative is selected. The stream reclamation improvements for Lone Tree Creek that are currently under design by ICON end well upstream of the diversion and do not impact alternatives regarding the best way to handle this split flow.

4. Caretaker Road Crossing

All of the culvert crossings under the Caretaker Road are relatively small and will overtop during storm events frequently. There is an ongoing issue at the Windmill and the eastern Lone Tree Creek culvert crossings with overtopping and standing water due to crushed and clogged CMP culverts. One alternative proposes improving Lone Tree and Windmill Creek crossings in accordance with the 90% plans already developed by ICON Engineering (See Attachment 2). The other alternative would increase pipe capacity and armor the Caretaker Road to minimize erosion when it overtops. The second alternative should be selected if increased flows are diverted to this location. This alternative proposes that the ICON design be revisited and modified as it as necessary to accommodate increased flows after the upstream diversion project is complete.

5. Eastern Cottonwood Creek at Shooting Range

Another split flow location exists downstream of the confluence of the three study watersheds along Cottonwood Creek just upstream of the Family Shooting Range (see figure in Attachment 1). Prior to the 2011 stream reclamation, most of Cottonwood Creek flowed through this diverted alignment. Today the entirety of the baseflow and likely almost all of the flood flows stay in the reclaimed channel via an earthen berm also constructed in 2011. The diverted channel still gets significant flow from local runoff and groundwater and currently runs through a lead contaminated site. The alternative that is being considered for this focus area is to pipe some of the flow through the shooting range which would minimize lead from ammunition from entering the Cottonwood Creek drainage system. This alternative was proposed by the former park manager, Jason Trujillo. However, in 2025 the shooting range lease is up for renewal which is part of a larger park planning effort that should be reviewed prior to investing in improvements to the site. Additional review of alternatives for this area will consider information provided in a Muller Engineering Company (2019) study: “Cherry Creek Shooting Center: Cottonwood Creek Drainageway Rehabilitation.”

Method of Alternative Selection

Given the need for TAC input on development and selection of project alternatives, WWE has not provided recommendations for alternatives selection in this interim memorandum. However, there is a recommended decision-making matrix provided in Attachment 1. This matrix includes some factors used in evaluating the upstream SEMSWA MDP as well as Muller’s 2022 Cherry Creek MDP. As part of the stakeholder process, WWE requests input on this matrix or another preferred method to support selection for alternatives. Next steps include a stakeholder meeting to agree upon an alternatives selection matrix (or process) and obtain stakeholder input on preferred alternatives.

CCBWQA TAC

July 28, 2023

Page 9

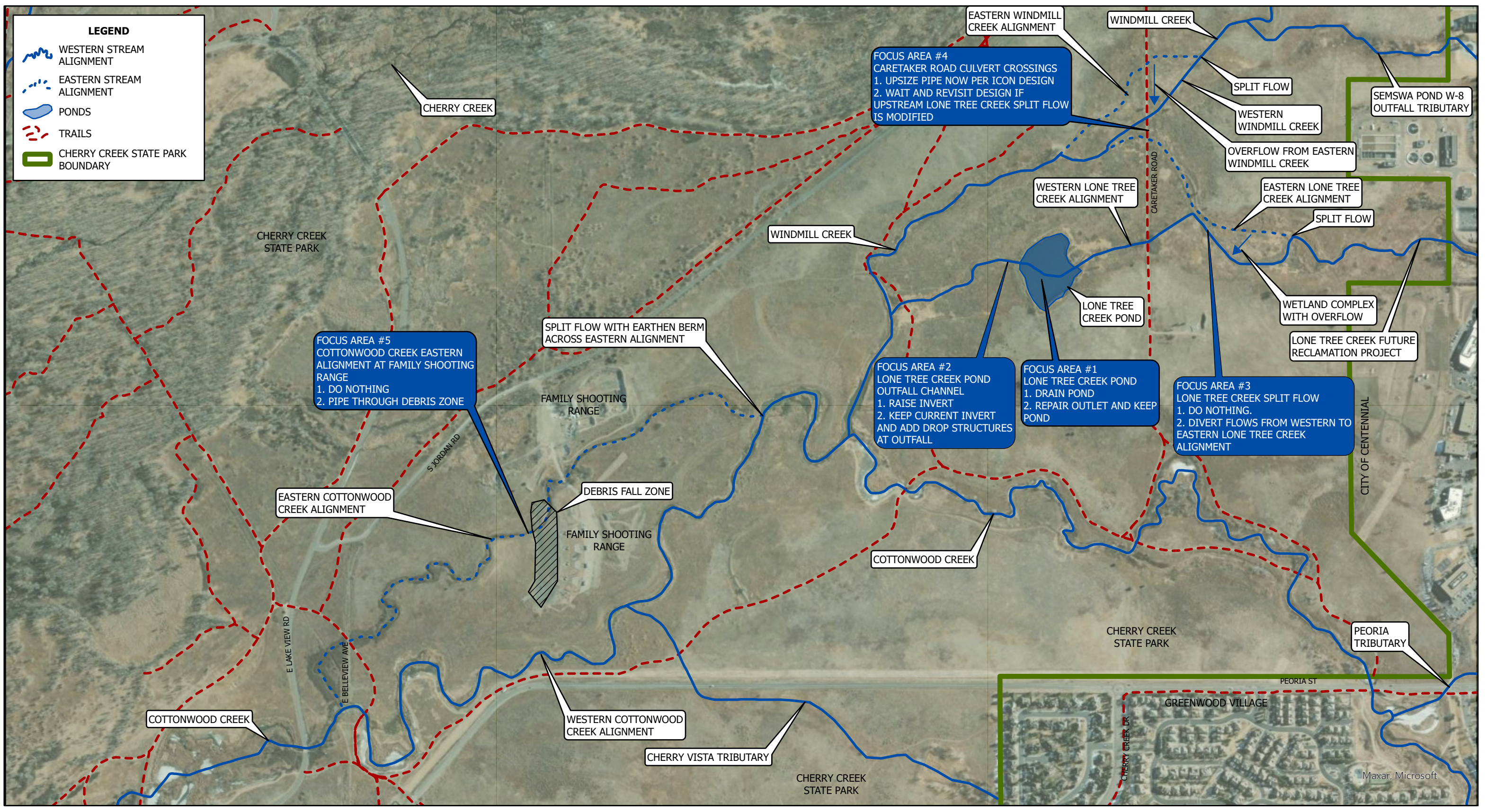
Attachments:

- Attachment 1 – Figure and Alternatives Matrix
- Attachment 2 – Excerpts from Relevant Reports
- Attachment 3 – Photos

cc: Jane Clary, WWE

Z:\Project Files\21\211-013\211-013.000\Engineering\2023 CCSP Master Plan\2023 Memo\July 2023 TAC Memo.docx

ATTACHMENT 1.



Path: Z:\Project Files\211211-088\211-088.000\CAD-GIS\GIS01_project\Basin_Fact_Sheets\Basin_Fact_Sheets\Basin_Fact_Sheets.aprx

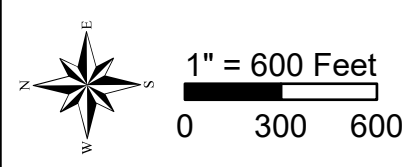


ARAPAHOE COUNTY, COLORADO

CHERRY CREEK STATE PARK

COTTONWOOD, LONE TREE, AND WINDMILL CREEKS

CHERRY CREEK BASIN WATER QUALITY AUTHORITY



PROJECT NO.
211-013.040

DRAFT
FACT SHEET
CCSP1

Scoring Parameters	Scoring Scale					Parameter Weight (%)
	1	2	3	4	5	
Project Cost	Over \$1M	\$500,000-\$1M	\$100,000-\$500,000	\$30,000-\$100,000	<\$30,000	35
Public Safety	Problem is severe or not addressed. Do nothing alternatives that do not address a public safety problem should score here.	Problem addressed minimally impacts drainageway health or public safety.	Problem addressed moderately impacts drainageway health or public safety.	Problem addressed impacts critical infrastructure and/or multiple factors of public safety.	Project results in large improvement to public health, safety, and infrastructure.	20
Water Quality	Do nothing alternatives that will result in ongoing water quality degradation should go here.	Project does not consider aspects of water quality. Do nothing projects that wont have a significant effect for water quality should go here.	Minimally meets obligations of CCBWQA and Regulation 72	Addresses a water quality concern downstream	Improves aspects of multiple components of water quality	15
Stream Health	Alternative will not prevent current degradation or will exacerbate it.	Current degradation might continue but might lessen due to the project.	Project likely will prevent further degradation to channel and long-term monitoring will indicate if future improvements are necessary.	Project goal is to completely stabilize channel section for long-term function.	Planning for high functioning and low maintenance stream that will function for the future developed watershed.	10
Environmental	Completely removes and does not replace wetland or riparian area, adds concrete to drainageway, and/or includes a large land disturbance in waterway.	Major construction impacts to jurisdictional wetlands, major drainageways, and/or mature riparian area.	Minor construction impacts to mature riparian areas and non-jurisdictional wetlands. "Do nothing" alternatives that will result in ongoing moderate degradation to these environmental features should score here.	No impacts to wetlands or mature riparian areas or projects with moderate construction impacts but the final condition significantly improves upon the current environmental features.	Improves riparian buffer area or wetlands with minimal impacts to existing ecology.	10
Community Value	Proposed project reduces recreation or aesthetic value.	Recreation or aesthetics are lacking and not improved.	Public is able to view or access the improved areas, which might add recreational or aesthetic value.	Public is able to access the improvements which add aesthetic or recreational value and project can be considered an amenity.	Accessible walkways are possible with recreational features proposed and improved aesthetics.	10
Subtotal Community Value						100

CHERRY CREEK BASIN WATER QUALITY AUTHORITY
2023 Capital Project Status Report
July 27, 2023

RESERVOIR PROJECTS

1. East Shade Shelters Phase III and Tower Loop Phase II Shoreline Stabilization (CCB-17.5 and CCB-17.7)
 - a. Description: These projects were identified in 2014 through the annual inspection. The Tower Loop Phase II connects to the Phase I project and extends shoreline protection 570 feet to the southeast towards Dixon Grove. The East Shade Shelters Phase III starts on the north end of the Shade Structure and goes 400-feet to the south.
 - b. Status: Consultant selection is scheduled for the 1st quarter. A consultant selection committee will be set in February (1/29/21). At the February TAC meeting Jason Trujillo, Jon Erickson, Lanae Raymond, Bill Ruzzo were interested in serving on the consultant selection committee (2/11/21). This selection committee was discussed at the 3/18/21 Board Meeting, and no further members were added. The Request for Proposals (RFP) has been posted on BidNet and Proposals are due 04/21/21 (3/25/21). The pre-proposal meeting was held on 4/7/21. 5 proposals were received on 4/28/21; the selection committee is reviewing them. Interviews were held and a selection is being brought to the May Board meeting (5/14/21). Board authorized negotiations with RESPEC (5/27/21). Agreement has been executed with RESPEC (10/15/21). Field Survey of project areas and topographic mapping is underway (12/30/21). A design kickoff meeting was held on 4/22/22. A design sprint workshop was held on 7/12/22 which included a site visit and evaluation of alternatives. RESPEC is developing a recommended alternative (9/8/22). RESPEC provided updated project costs for budgeting (10/13/22). The 30% submittal was received on 11/16/22 and is under review. CCBWQA provided comments on 30% review on 1/17/23; a value engineering effort is recommended as the project costs exceed the budget. The value engineering meeting was held on 2/24/23. RESPEC's request for additional services was approved by TAC and Board in May (5/25/23). *The reservoir water level has come down since the May and June storms and additional erosion was observed on 7/14/23; a site visit has been scheduled with RESPEC on 8/1/23.*

STREAM RECLAMATION PROJECTS

1. Cherry Creek Stream Reclamation at Arapahoe Road aka Reaches 3 and 4 (CCB-5.14C)
 - a. Description: This project continues the work on Cherry Creek by CCBWQA, MHFD, and local partners. It ties into the previous stream reclamation projects of Cherry Creek Eco Park to Soccer Fields (CCB-5.14A) and Cherry Creek at Valley Country Club (CCB-5.14B). The 5,167 Linear Feet of stream reclamation reduces bed and bank erosion immobilizing approximately 88 pounds of phosphorus annually. The project is anticipated to be funded over several years and likely be broken into phases.
 - b. Status: In 2021, an IGA was executed between CCBWQA, MHFD, City of Aurora, and SEMSWA to begin this work. IGA Amendment that brings in 2022 funding is under review (5/13/22). Board authorized IGA Amendment for 2022 funding on 7/21/22 (8/12/22). IGA Amendment has been revised to show Aurora's lower participation; CCBWQA's participation was lowered accordingly to meet 25% partner project level; revised IGA Amendment received TAC recommendation and is being taken to Board for their consideration in October (10/13/22). Board authorized the IGA Amendment for 2022 funding at their 10/22/22 meeting. It appears that CCBWQA's 2023 participation will be reduced as a result of less partner funding available for this project (2/24/23). The IGA Amendment that brings in 2023 funding was recommended by the TAC and authorized by the Board at their June meetings (6/29/23).
2. Cherry Creek Stream Reclamation – Upstream of Scott Road (CCB-5.17)

- a. Description: Design and construction of stream reclamation is in partnership with Douglas County and MHFD. It improves 4,100 feet of Cherry Creek and is located upstream of Scott Road.
 - b. Status: IGA was approved by the Board at their April 2020 meeting. Muller had been selected as consultant, and design scope of work is being prepared. Kickoff meeting was held on 12/11/20; a follow-up field visit will be scheduled for early 2021. Site visit was held on 1/29/21. Conceptual design is complete, negotiations are underway to contract for 60% design (4/8/21). Muller is working on alternatives (4/30/21). Muller is working on preliminary design and an IGA Amendment to bring in additional 2021 funding from Douglas County is being brought to the Board in October (10/15/21); IGA Amendment has been executed (11/11/21). Muller is preparing 60% Design Submittal (1/28/22). Muller submitted 60% Design on 2/2/22; comments have been provided on 60% Design Submittal (3/10/22). IGA Amendment bringing in 2022 funding is scheduled for TAC and Board consideration in June (5/27/22). IGA Amendment was authorized at the June 16th Board Meeting (6/30/22). Muller is working on Final Design and held a progress meeting on 4/14/23, a site visit is being scheduled to support the 90% design submittal. The 90% site visit was held on 5/22/23.
3. Cherry Creek Stream Reclamation at Dransfeldt (CCB-5.17.1B)
- a. Description: Design and construction of stream reclamation is in partnership with Town of Parker and MHFD. It improves 2,400 feet of Cherry Creek near the future location of Dransfeldt bridge which is just downstream of the Cherry Creek at KOA project.
 - b. Status: Initial scoping has begun, and a partners meeting was held on 1/30/21. IGA is scheduled for CCBWQA's May TAC and Board meetings (4/30/21). IGA was approved by all parties and has been executed (6/25/21). Muller Engineering has submitted their Draft Scope of Work for Design Services, and the project sponsors have reviewed it (7/8/21). Design kickoff meeting was held on 10/14/21. Alternatives are being evaluated (12/9/21). Pre-submittal meeting for the 404 permit is being scheduled (12/30/21). CLOMR is being prepared for project (3/10/22) and was submitted to FEMA on 3/31/22. CEI was selected for as project partner to provide contractor input during the design (5/27/22). CLOMR is under review by FEMA (8/12/22). Muller has received comments on CLOMR and is preparing responses; 90% Submittal is scheduled for early February (1/27/23). Comments on 90% Submittal were provided on 2/22/23; project is experiencing substantive cost increases due to current market conditions (2/24/23). TAC at their 3/2/23 meeting recommended that the Board authorized the IGA Amendment to bring in 2023 funding along with an increase in CCBWQA's 2023 funding from \$170,000 to \$570,000. The Board authorized the IGA Amendment with the increased 2023 funding of \$570,000 at their 3/16/23 meeting. The Conditional Letter of Map Revision (CLOMR) was issued by the Federal Emergency Management Agency (FEMA) on April 28, 2023 (5/12/23). The sanitary sewer relocation will be contracted to start with, in order to avoid a pipe material cost increase, and to get it out of the way for the forthcoming stream reclamation (7/13/23).
4. McMurdo Gulch Priority 3 Stream Reclamation (CCB-7.2)
- a. Description: The design and construction of stream reclamation is in partnership with Castle Rock. Castle Rock is the lead agency. This phase continues the work from the previous phase. Muller Engineering is the design consultant.
 - b. Status: Board authorized IGA for Priority 3 at their May 19,2022 meeting. Muller submitted their 30% deliverable on 10/31/22, review comments were returned on 11/8/22. Easements needed for projects have been identified (1/23/22). The 60% Submittal was received on 1/30/23 and comments have been provided on 2/7/23. Muller is working on updating their construction cost estimate (2/8/23). On 2/23/23, Castle Rock requested that CCBWQA's 2023 funding be deferred to 2024 to match their schedule.
5. Lone Tree Creek in Cherry Creek State Park (CCB-21.1)
- a. Description: This project includes a trail connection to Cherry Creek State Park and includes 570 linear feet of stream reclamation on Lone Tree Creek from the State Park Boundary to

the Windmill Creek Loop Trail. The City of Centennial is the project lead. CCBWQA participation is for stream reclamation only.

- b. Status: 95% submittal is under review (5/13/22); review comments have been returned (5/27/22). Project funding was brought to TAC at their 7/7/22 meeting, during drafting of IGA it was discovered that future maintenance of stream reclamation should be considered, project will be brought back to TAC at an upcoming meeting for maintenance discussion and recommendation (8/12/22). A stakeholder meeting was held on 9/29/22 to discuss maintenance. A stakeholder meeting was held on 11/2/22 to discuss findings from CCBWQA's site visit and findings included in Wright Water Engineers report. The Board supports CCBWQA's partnering with Centennial at their 11/17/22 meeting. A Memo of Understanding is under review by Colorado Parks and Wildlife (CPW) affirming maintenance responsibilities for the stream reclamation fit under the current agreement between CCBWQA and CPW (3/30/23). CCBWQA sent the Draft IGA to Centennial for review on 5/23/23.
6. Happy Canyon Creek – County Line to Confluence with Cherry Creek (aka Jordan Road, CCB-22.1)
- a. Description: The design and construction are in partnership with Southeast Metro Stormwater Authority and MHFD and includes 2,500 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$325,000. The total project cost is estimated at \$1,300,000.
 - b. Status: IGA is scheduled for June TAC and Board meetings (5/27/21). IGA has been approved and executed by all parties (7/29/21). Jacobs has been selected as design consultant and project scoping is underway; limits have been extended upstream to the County Line and sediment capture area and transport will be included with the project (10/15/21). Jacobs has submitted their scope of work and fee for design which is under review by project sponsors (11/11/21). Project sponsors have completed a review of Jacobs' fee and scope of work and the agreement is being routed for signatures (1/28/22). IGA Amendment to bring in 2022 funding is in process (3/10/22). A project kickoff meeting was held on 3/28/2022. A site visit was performed on 4/12/22 to document existing conditions and identify sediment source/transport/deposition areas. Project Team is preparing a sampling plan for bank and bed materials to determine phosphorous content (5/13/22). The project team met on 5/24/22 to discuss project goals and Jacobs is progressing through the study. Jacobs and ERC are working on sediment transport analysis and model (6/30/22). The results from the sediment transport model were presented at the 8/23/22 progress meeting and an upstream sediment capture area just south of the JWPP was included in the alternatives analysis (8/26/22). The alternative analysis report is expected to be completed before the end of 2022 (10/13/22). Lab results from stream soil samples were sent to Jacobs so that they include phosphorus reduction in the alternatives analysis report; a groundwater investigation is needed to inform sediment capture facility and stream reclamation alternatives, scoping and negotiations are in progress (11/11/22). Groundwater scope of work has been reviewed and approved by project sponsors (1/13/23). The IGA Amendment bringing in the 2023 funding was recommended by TAC and authorized by the Board in April (5/12/23).
7. Happy Canyon Creek - Upstream of I-25 (CCB-22.2)
- a. Description: The design and construction are in partnership with Douglas County, City of Lone Tree, and MHFD and includes 2,500 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$500,000. The total project cost is estimated at \$2,000,000.
 - b. Status: Douglas County, City of Lone Tree, and MHFD have initially funded and selected Muller Engineering as the design engineer. Design has started and a progress meeting was held on 1/27/21. Design is progressing (2/11/21). Muller has submitted 60% Design Deliverables (5/27/21). IGA for 2021 Funding is being brought to Board in September (9/9/21). 2021 IGA Amendment has been executed (11/11/21). Coordination with CDOT and easement acquisitions are on-going (1/13/22). Board authorized 2022 funding and IGA Amendment at their June 16th meeting (6/30/22). The project received environmental clearance from CDOT (8/12/22). The 90% design submittal is scheduled for delivery by end

of September (8/26/22). The 90% design submittal is being reviewed (10/13/22). Comments were provided on 90% submittal (11/11/22). Muller completed the 100% design submittal on 11/22/22. CDOT permit was issued, and pre-construction meeting was held on 1/10/23; construction start is scheduled for 1/30/23 pending execution of easement documents from Surrey Ridge which has agreed to terms and easement language. Notice to Proceed on construction is pending execution of easement documents (1/27/23). Easements have been signed by property owners and Notice to Proceed has been issued to Naranjo Civil Constructors (2/8/23). Construction is underway with initial construction BMPs/stormwater controls in place; water diversion and control is being set up for the downstream section of the project (3/10/23). Water control is in place and construction of stream reclamation is underway for downstream sections of the project (3/30/23). Riffle and Boulder Cascade drop structures on downstream third of project are nearing completion (4/13/23). Construction is underway in the middle third of the project; efforts consist of stream grading and installation of Riffle and Boulder Cascade drop structures (5/12/23). The storm damage from May 11 to 13, 2023 event is being identified and repaired (5/25/23). *Construction on the middle third is substantially complete and work has begun on upstream third (7/27/23).*

8. Dove Creek - Otero to Chambers Rd. (CCB-23.1)

- a. Description: The design and construction are in partnership with Southeast Metro Stormwater Authority (SEMSWA) and with Mile High Flood District (MHFD) being a key stakeholder; it includes 1,300 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$175,000. The total project cost is estimated at \$700,000.
- b. Status: SEMSWA is drafting the Intergovernmental Agreement to bring in the 2021 funding for the project (3/12/21). RESPEC is the design consultant; two conceptual design alternatives have been prepared and reviewed during meeting on 3/15/21. IGA is scheduled for CCBWQA's May TAC and Board meetings (4/30/21). IGA has been approved and executed by all parties (7/29/21). 30% Design Review Meeting was held on 8/23/21. A Progress meeting is scheduled for 2/26/22 with 60% Plan submittal expected to follow (1/28/22). The 60% Design was submitted on 2/16/2022, comments were provided, and a design review meeting was held on 2/23/2022. IGA Amendment to bring in 2022 funding is in process (3/10/22). Construction costs were prepared by CEI based on 60% submittal (5/13/22). A design progress meeting was held 6/14/22 and 90% design submittal is being prepared (6/30/22). 90% design submittal is expected by the end of July (7/15/22). The 90% design submittal was reviewed, and comments were submitted on 8/22/22. *Construction is anticipated in 2023 (10/13/22)*. A progress meeting was held on 11/8/22, project will likely be done in 2 phases, IGA Amendment will be needed early in 2023 so that construction can start ahead of storm season. Dove Creek IGA for construction of Phase 1 is scheduled for TAC and Board in January 2023, construction is expected to start shortly afterwards (12/30/22). Construction is scheduled to start mid-February; construction agreement and engineering construction services amendment are currently being reviewed (1/27/23). Construction and engineering construction services have been finalized and a preconstruction meeting was held on 2/2/23. Notice to Proceed has been issued to Concrete Express; construction is underway with initial construction BMPs/stormwater controls in place (3/10/23). Water control is in place and construction of stream reclamation is on-going (3/30/23). Step pool drop structures have been constructed and work on soil wraps is underway (4/13/23). Low-flow or bank full channel work (soil wraps and erosion control blanket) and step-pool structures are complete, water diversion has been removed, and is active to storm flows; work continues in upland areas and higher elevations of stream reclamation (5/12/23). Storm damage from May 11 to 13, 2023 event is being repaired (5/25/23). Construction punch list is being completed (6/29/23). *Construction is complete (7/27/23).*

9. Piney Creek from Fraser Street to Confluence with Cherry Creek aka Reaches 1 and 2 (CCB-21.1)

- a. Description: This project includes 2900 liner feet of stream reclamation on Piney Creek. The project partners are SEMSWA and CCBWQA.

- b. Status: Project coordination meeting was held with SEMSWA on 6/29/22. IGA drafted and is being reviewed by SEMSWA (8/12/22). IGA was approved by CCBWQA at the 9/15/22 Board meeting. IGA Amendment to bring in 2023 funding was recommended by the TAC and authorized by the Board in May (5/25/23). CCBWQA sent the Draft IGA Amendment to SEMSWA for review on 6/29/23.

- 10. Mountain and Lake Loop Shoreline Stabilization Phase II (OM 4.6)
 - a. Description: This project was identified in through the 2020 annual inspection and design and permitting started in 2021. It adds about 40 feet of shoreline protection where it has eroded leaving a 1-2 foot tall vertical bank.
 - b. Status: Construction Plans have been prepared and the GESC was submitted to Arapahoe County for review (1/13/22). Plans are being reviewed by US Army Corps of Engineers for 408 clearance (5/13/22).

- 11. Cherry Creek from Reservoir to Lake View Drive (OM 4.6)
 - a. Description: This project is in follow up to CCBWQA's study of Cherry and Piney Creeks in Cherry Creek State Park (CCSP). Muller completed two reports on Cherry Creek from Reservoir to State Park Boundary, Stream and Water Quality Assessment and Baseline Channel Monitoring Report, in 2022. These reports highlight the need for this project.
 - b. Status: A workshop is scheduled for the 3/16/23, to seek CCBWQA Board and TAC input on this project and Cherry and Piney Creeks in CCSP (3/10/23). *The follow up from workshop is underway – project overview and funding flyer has been created*, Muller is scoping the next step of design for Reach 1 and providing a fee, and multi-pronged approach is in development for workshop priority reaches that prioritizes Reach 1 and reduces risk from upstream reaches; these items will be brought to TAC and Board for discussion, direction, and/or action at upcoming meetings (3/30/23). A site visit for partner outreach and funding was held on 5/25/23 at 1-4 pm (6/8/23). A coordination meeting was held with Aurora on 6/23/23 and they showed interest in partnering on the project to protect their water lines. The Mile High Flood District has provided their budget/CIP schedule and Arapahoe County Open Space has been contacted to investigate potential partnering opportunities (7/13/23).



Task Memorandum

Task: RDS Operations Report

Date: 7/26/23

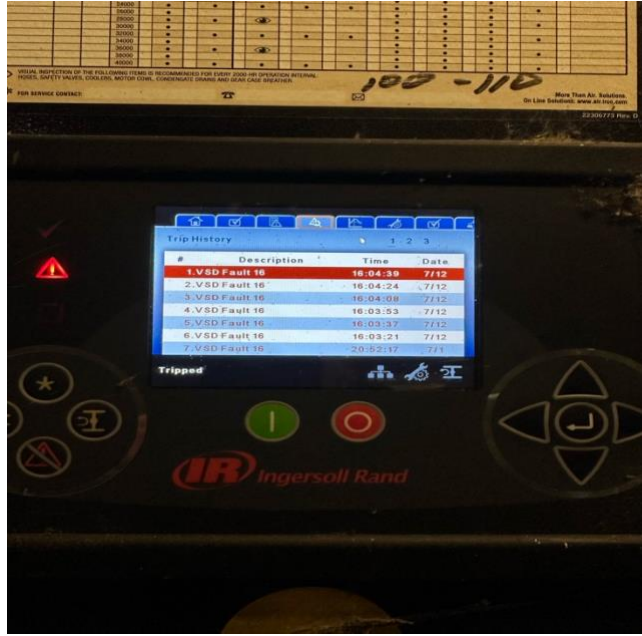
To: Board an TAC

By: Ricardo Gonçalves, PE

On 7/13/23 at 8:15 am I performed a visual inspection of the diffuser pattern on the reservoir and found that was no pattern, meaning that no air was getting to the reservoir. I then made an inspection of the compressor and found it was off, with a fault indication reading "VSD Fault 16" at 4:18 pm, 7/12/23. I immediately called Jeff Handley, who talked me through a restart. The compressor started immediately with no issue. Jeff said the fault had been a voltage drop, probably from local area heavy air conditioning usage, as it was very hot that day. I asked Jeff why I had not received an alarm that the compressor had shut off, and why his crew hadn't. He said he didn't know but would check into it.

Jeff got back to me later, and said that IR had gotten a "Fault" notice, but it had come in by email after his crews had quit for the day. He said he saw that he had gotten it right after he got off the phone with me. We both monitored the compressor operation the rest of the weekend and the next week. He noted that the clock on the unit was off-time by 2 hours and reset it. Everything on the compressor checked out well.

On the Monday, July 24, Jeff and I talked and got me completely set up on the RMS system, so I would get shutdown and alarm alerts 24/7 in the future.



The compressor screens as I found them on July 13th.



Compressor operating perfectly on a July 19th checkup



HOME COMPRESSED AIR EQUIPMENT SETTINGS

Asset MOX1002352

+ Follow Edit Nickname New Service Request

Account	Siebel ID	Install Date	Contact	District	Status
Cherry Creek Reservoir	1-85HPJMR	4/30/2021		Rocky Mountain	Active

Details Real-Time Data Service Activities Helix Alarm Alerts Notification Subscriptions Related Records

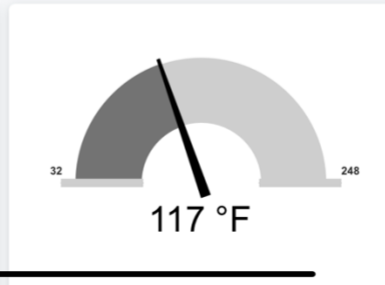
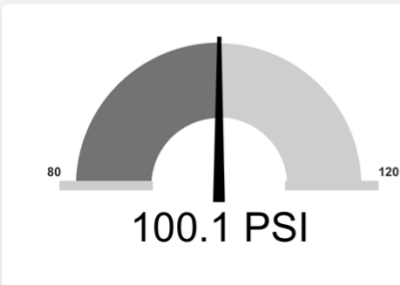
> Real-time Data Unit Preferences

Asset Dashboard

just now

Machine Parameters

Running Hours



Screen-shot of compressor real-time status on July 26 at 4:30

Memorandum

To: CCBWQA Technical Advisory Committee
From: Jessica DiToro, PE, LRE Water
Reviewed by: Jane Clary, Wright Water Engineers
Date: July 24, 2023
Subject: Graywater Control Regulation #86 Rulemaking Hearing

Issue: Colorado’s graywater¹ rules are housed in [Control Regulation #86](#) (CR 86). After a robust stakeholder process lasting more than 1.5 years, CR 86 is now [noticed](#) for a public Rulemaking Hearing (RMH). The RMH is scheduled for November 13, 2023. There is one proposed change to CR 86 that is relevant to the Cherry Creek Basin Water Quality Authority (CCBWQA). The change is new language that requires any city and/or county that wishes to implement a graywater control program within a basin subject to a Control Regulation (i.e., Control Regulation 72 (CR 72)) to notify the Control Basin Authority (i.e., CCBWQA) of its plan to adopt a graywater program and comply with any applicable regulations in the relevant Basin’s Control Regulation.

CR 86.6(A)(6): *"6. A city, city and county, or county that is subject to one of the control regulations 5 CCR 1002-71 through 1002-75 must notify the control basin authority of its plan to adopt a local graywater control program prior to adopting an ordinance or resolution. The graywater control program must require that the use of graywater be in compliance with any applicable requirements in CCR 1002-71 through 1002-75."* (Notice page 7 of 53)

Statement of Basis and Purpose (SBP) Language has also been proposed to explain the rationale for the proposed language:

SBP Language: *"B. Water Quality Control Commission’s Control Regulations – 86.6(A)(6) The commission deemed it necessary to include a requirement for local graywater control programs to require compliance with nutrient control regulations (5 CCR 1002-71 through 1002- 75), and for notification to be provided to the basin control authorities. Regulation No. 86 does not contain phosphorus treatment techniques or standards."* (Notice page 50 of 53)

The proposed change does not give CCBWQA any “teeth” when it comes to reviewing the proposed graywater programs, it only requires the entity pursuing graywater to notify CCBWQA of the program. Additionally, CR 72 does not address graywater, so there are no applicable requirements that could be enforced on a graywater program that is proposed to occur within the Cherry Creek Basin. As the practice of graywater is still relatively new in Colorado, Staff does not view updating CR 72 to address graywater as an urgent need, and any changes can wait until a future triennial RMH (if at all).

Next Steps: CCBWQA Staff will monitor the RMH but do not intend for the CCBWQA to participate as a party to the RMH.

¹ Water generated in residential or commercial buildings from streams that do not introduce fecal contamination (i.e., washing dishes, laundering clothes, bathing) which may then be utilized for additional uses (i.e., toilet flushing, certain types of irrigation).