



**Cherry Creek Basin Water Quality Authority  
Technical Advisory Committee Meeting Agenda  
Thursday, June 6, 2024, 9:00 a.m.**

**In-person attendance is encouraged due to audio limitations in the meeting room.**

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

**Virtual: Zoom  
<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 and Introductions (9:00) (5 minutes)
  - a. Ben Emerson, Parker Water and Sanitation District, Replacing Rebecca Tejada
  - b. Jacob Deitz, Douglas County Health Department Replacing Caitlin Gappa
2. Meeting Minutes from May 2, 2024 (enclosed)
3. Highlights from the May 16, 2024 Board Meeting (Clary) (9:05) (5 minutes)
4. Discussion and Action Items (9:10) (30 minutes)
  - a. Discussion on Cherry Creek Reach 1
  - b. Recommendation on Muller's Final Alternatives Analysis Report (Loewen, enclosed)
  - c. Recommendation on the Preliminary Design Agreement for Cherry Creek Reach 1 (Loewen, enclosed)
5. Action Items (9:40) (50 minutes)
  - a. Recommendation on Runoff Reduction Study Report (Olson/Clary, WWE Report)\*
  - b. Recommendation on Wetland Harvesting Options (Stewart, enclosed)
  - c. Recommendation on Cherry Creek Middle School #8 Lift Station (Goncalves, enclosed)
  - d. Recommendation on McMurdo Gulch Priority 3 Agreement Amendment (Loewen, enclosed)\*
  - e. Recommendation on Sulphur Gulch Master Drainage Plan IGA (Loewen, enclosed)\*
  - f. Authorization for a Special TAC Committee to Make Recommendations on Behalf of the TAC for the July Board Meeting (Knerr)
6. Presentations (10:30) (5 minutes)
  - a. Real-time Water Quality Dashboard (Stewart)
7. TAC Member Updates (As Needed)
  - a. Cherry Creek Race for the Watershed - Save the Date - July 13, 2024 (enclosed)
8. Updates (10 minutes)
  - a. Manager (Clary)
  - b. Cherry Creek Stewardship Partners (Davenhill)
    - i. Cherry Creek Watershed Conference - November 12, 2024 at the PACE Center in Parker
    - ii. Colorado Section SRM Summer Field Day - July 19, 2024 Gather at Prairie Canyon Ranch (enclosed)
  - c. [TAC Subcommittees](#) (As Needed)
    - i. Modeling Subcommittee
    - ii. Watershed Plan Subcommittee
    - iii. Cherry Creek Reach 1 Reservoir to Lakeview Drive Subcommittee
    - iv. CIP Subcommittee (Meeting June 27, 9:00 a.m.)
  - d. Contractors (As Needed)
    - i. [Water Quality Update](#) (Stewart)
    - ii. Pollution Abatement Projects - CIP Status Report (Loewen, enclosed)
    - iii. In-Park PRF and RDS Maintenance and Operations (Goncalves)

- iv. Regulatory (DiToro)
  - a. 10-year WQ Roadmap and Feasibility and Implementation Workgroup Update
  - v. [Land Use Referral Tracking](#) (Endyk)

9. Adjournment

[Board Binder](#) and [2024 Timeline](#)

\*Supplemental Packet Enclosure



**Cherry Creek Basin Water Quality Authority  
Technical Advisory Committee Meeting Agenda  
Thursday, May 2, 2024, 9:00 a.m.**

**TAC Members Present**

Alex Mestdagh, Town of Parker (zoom)  
Ashley Byerley, TAC Vice Chair, SEMSWA (representing the City of Centennial)  
Casey Davenhill, Board Appointee, Cherry Creek Stewardship Partners  
Cayla Cappello, City of Greenwood Village  
David Van Dellen, Town of Castle Rock  
James Linden, SEMSWA - Alternate (zoom)  
Jeremiah Unger, CDOT (zoom)  
Jim Watt, Board Appointee, Mile High Flood District  
Jon Erickson, Board Appointee, Colorado Parks and Wildlife (zoom)  
Kat Hoffman, CDOT - Alternate (zoom)  
Lisa Knerr, TAC Chair, Arapahoe County  
Michelle Seubert, Board Appointee, Cherry Creek State Park (zoom)  
Rick Goncalves, Board Appointee  
Ryan Adrian, Douglas County (zoom)

**Board Members Present**

John Woodling, Governor's Appointee  
Tom Downing, Governor's Appointee (zoom)

**Others Present**

Alan Leak, RESPEC  
Christine Hawley, Hydros (zoom)  
Elysa Loewen, Loewen Engineers  
Erin Stewart, LRE Water  
Hannah Branning, Castle Rock Water  
Jane Clary, Wright Water Engineers, CCBWQA Technical Manager  
Jessica DiToro, LRE Water (zoom)  
Val Endyk, CCBWQA

**1. Call to Order *RECORD MEETING***

Lisa Knerr called the meeting to order at 9:00 am.

**2. Meeting Minutes from April 4, 2024**

David VanDellen moved to approve the April 4, 2024 meeting minutes. Seconded by Rick Goncalves. The motion carried.

**3. Highlights from the April 18, 2024 Board Meeting and Watershed Plan Workshop**

Jane Clary provided an update on actions taken at the April 18, 2024 Board meeting and Watershed Plan Workshop. Minutes from the Board meeting can be found [here](#). The presentation from the Watershed Plan Workshop can be found [here](#).

#### 4. Action Items

##### a. Recommendation on Piney Creek Reaches 4-5 Agreement

Elysa Loewen provided the TAC with an [Action Item Memo](#) detailing the Piney Creek Reaches 4-5 project. The Project is on Piney Creek upstream of Orchard Road and approximately 2,000 feet downstream of the Tower Road crossing in the City of Centennial and Arapahoe County. It is a partner project with MHFD and SEMSWA with MHFD as the project lead. It is estimated that this 0.72-mile-long project will immobilize 65 pounds of phosphorus annually. Project funding was included in CCBWQA's 2024 Budget. A draft of the [IGA Amendment](#) was included in the TAC packet.

Rick Goncalves moved that the TAC recommends that the Board authorize the execution of the IGA for Stream Improvements at Piney Creek Reaches 4 & 5 pending satisfactory resolution of CCBWQA's comments, if any, with an expenditure not to exceed \$75,000 for 2024 and project transfer of \$11,023.13 from Piney Creek at Caley Avenue Project excess funds. Seconded by David VanDellen. The motion carried.

##### b. Recommendation on Cherry Creek at Arapahoe Road Agreement

Elysa Loewen provided the TAC with an [Action Item Memo](#) detailing the Arapahoe Road project. The Project is on Cherry Creek approximately 2,000 feet downstream of Arapahoe Road to approximately 3,000 feet upstream of Arapahoe Road in the City of Aurora and Arapahoe County. The downstream limits of the project are just over three miles upstream of the Reservoir. It is a partner project with MHFD, SEMSWA, and the City of Aurora with MHFD as the project lead. It is estimated that this 0.98-mile-long project will immobilize 88 pounds of phosphorus annually.

This project will also tie into two previously completed channel stabilization projects at the downstream limits (Cherry Creek at Valley Country Club) and at the upstream limits (Cherry Creek Improvements at the Soccer Complex) resulting in a continuous stretch of improved channel between the three projects.

Project funding was included in CCBWQA's 2024 Budget which included funding of \$300,000. The contribution has been adjusted/reduced to \$165,000 to coincide with reduced funding from other partners for this year. A draft of the [IGA Amendment](#) was included in the TAC packet.

Ashley Byerley moved that the TAC recommend that the Board authorize the execution of the 3rd Amendment to the IGA for Stream Improvements at Cherry Creek at Arapahoe Road pending satisfactory resolution of CCBWQA's comments, if any, with an expenditure not to exceed \$165,000 for 2024. Seconded by Cayla Cappello. The motion carried.

##### c. Recommendation on Site Application for Castle Pines North Lift Station No. 1

Rick Goncalves provided the TAC with an [Action Item Memo](#) detailing the Site Location Application Review of Castle Pines North Lift Station 1. The lift station is in the City of Castle Pines, two miles NW of I-25/Hess Road Interchange and nine miles SW of Cherry Creek. The applicant is Castle Pines North Metropolitan District. The project adequately meets the specific criteria as outlined in CCBWQA's Guidance Document.

Additionally, Rick Goncalves provided the TAC with a copy of the [review report](#) further summarizing his review of the Castle Pines North Lift Station No. 1 and providing a recommendation to the TAC.

Ashley Byerley moved to recommend that the Board approve the Castle Pines North Lift Station 1 Site Location Application and sign said Site Location Application as the 208 Management Agency for the basin. Seconded by David VanDellen. The motion carried. Rick Goncalves abstained.

#### 5. Discussion Items

##### a. Update on Reservoir Model (Hawley, enclosed)

Christine Hawley with Hydros Engineering provided the TAC with a draft [memo](#) on phase 1 of the watershed and reservoir model linkage runs and [presented](#) the model results to the TAC.

Christine explained that the Cherry Creek Reservoir model was used to simulate the effects of two watershed management scenarios on reservoir water quality in addition to a baseline scenario. The selected watershed model runs broadly represent the worst-case (Run 6) and best-case (Run 13) predictions of future watershed



conditions in terms of watershed management. Flow and water-quality results from the HSPF watershed model (RESPEC, 2024) were translated into inputs to the reservoir model using the linkage approach developed in 2020 (Hydros, RESPEC, and Kilgore, 2020). These simulations were conducted to evaluate the linkage approach and to gain insights into the potential range of reservoir water-quality response to future watershed conditions. The simulation results indicate that watershed management is an important focus to protect reservoir water quality; however, in-reservoir management approaches may also need to be considered to meet the current chlorophyll-a standard. This finding agrees with previous modeling results indicating that management approaches focused exclusively on either internal or external nutrient sources are unlikely to result in compliance with the current chlorophyll-a standard.

Discussion included:

- The linkage approach worked well, other than one issue related to the total suspended solids (TSS) translation from the HSPF model. Hydros made an adjustment to address this issue for purposes of the model runs; however, particle size distribution sampling is recommended to further refine the model.
- The model runs showed that reservoir conditions would be worse in the absence of watershed mitigation work; however, watershed management alone will not bring the reservoir into compliance with its chlorophyll-a standard.
- The model outputs will be used to support the on-going watershed plan update.
- The models may need to be updated to simulate more recent conditions and responses.

**b. Wetland Harvesting Update (Stewart, enclosed)**

Erin provided the TAC with an [update](#) on the Wetland Harvesting project and included 2023 harvesting results. Although significant phosphorus and nitrogen are being removed from the watershed in wetland biomass, it is not clear whether the wetland harvesting is translating to a measurable water quality benefit downstream in Cottonwood Creek. Erin provided some pros and cons that will be further considered at the June TAC meeting since a decision needs to be made regarding moving forward with contracting for wetland harvesting in September. Generally, the TAC expressed support for continuing the project and suggested that it could be good to follow-up with SEMSWA regarding additional input on the potential benefits.

One consideration is that the location of the wetland harvesting project may not be ideal for purposes of measuring benefits because of relatively low phosphorus concentrations associated with the PRF in this reach. The site was chosen in part due to existing monitoring stations and ease of access. Although a pilot project location on Cherry Creek has not been identified, this could be an option to consider.

**c. Cherry Creek Flow Monitoring Upstream of Reservoir**

Erin Stewart provided an update that due to changes in reservoir elevation by the USACE, a new site for monitoring stage and flow measurement upstream on Cherry Creek at Aurora’s water line is recommended. A new rating curve is being developed for Lakeview Drive but both locations are needed. Water quality samples will continue to be collected at CC-10 for continuity. CCBWQA’s 2024 equipment budget can cover the cost for the equipment and installation.

**d. Watershed Plan Follow-up (Clary)**

Jane Clary reminded the TAC to provide comments on Chapters 1-3 on the Watershed Plan as soon as possible and Chapter 4 by the end of May.

**6. Presentations (none)**

**7. TAC Member Updates (As Needed)**

David VanDellen introduced Hannah Branning with Castle Rock Water as their new regulatory manager. SEMSWA is continuing to review the dredge and fill regulations related to the Colorado “Gap Waters” legislation.

**8. Updates (20 minutes)**

**a. Manager (Clary)**

Cherry Creek Reach 1 grant applications have been submitted.

**i. Runoff Reduction Report Status Update**

Wright Water Engineers is working on the final report and will present it to the TAC in June.

**b. Cherry Creek Stewardship Partners (Davenhill)**

**i. Conference Planning** - Save the date for November 12, 2024 at the PACE Center in Parker.

May 18, 2024 Be Dam Aware event

Other Stewardship Partners events and details can be found at the [website](#).

**c. [TAC Subcommittees](#) (As Needed)**

**i. Modeling Subcommittee**

**ii. Watershed Plan Subcommittee**

**iii. Cherry Creek Reach 1 Reservoir to Lakeview Drive Alternatives Analysis Subcommittee**

**iv. CIP Subcommittee**

**v. Lone Tree, Windmill, and Cottonwood Creek Subcommittee**

**a. Update TAC that this Subcommittee is closed**

**d. Contractors (As Needed)**

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

**ii. Pollution Abatement Projects - CIP Status Report (Loewen, enclosed)**

**a. Cherry Creek Reach 1 Alternatives Analysis**

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

**a. RDS system activated April 16, 2024**

**b. Perimeter Pond cleanout**

**iv. Regulatory (DiToro)**

**a. Update on the 10-Year Water Quality Roadmap Feasibility Subgroup**

**v. [Land Use Referral Tracking](#) (Endyk)**

**9. Adjournment**

Lisa Knerr adjourned the meeting at 11:00 am

[Board Binder](#) and [2024 Timeline](#)



## ACTION ITEM MEMORANDUM

**To:** CCBWQA Technical Advisory Committee (TAC)  
**From:** Elysa Loewen, Pollution Abatement Project Manager  
**Date:** June 6, 2024  
**Subject:** Cherry Creek Reach 1 Alternatives Analysis Report

**Request:** Move that the TAC recommends that the Board accepts the Cherry Creek Reach 1 Alternative Analysis prepared by Muller Engineering Company (May 10, 2024) provided that no major concerns are identified in the external peer review being conducted concurrently.

**Background:** Muller Engineering Company (Muller) started their initial assessments of Cherry Creek in Cherry Creek State Park (CCSP) in 2020; their initial reports included *Cherry Creek Stream and Water Quality Assessment (2022)* and the *Cherry Creek Baseline Channel Monitoring Report (2022)* which identified Reach 1 (Reservoir to Lakeview Drive) as a priority reach within CCSP and were accepted by the Board in December 2022. Muller attended a workshop in March of 2023 and demonstrated the importance of work on Reach 1.

**Project:** The CCBWQA TAC and Board gave approval for Muller to begin their alternative analysis of Cherry Creek Reach 1 in April of 2023. After completing their analysis, Muller attended the April 2024 TAC meeting, where they presented their recommendations in detail and received feedback from the TAC. After the April 2024 TAC meeting, Muller incorporated the feedback received and finalized the Alternatives Analysis report in May 2024.

Per direction by the Board in the May 2024 meeting, an external peer review of the alternatives analysis will be performed and expected to be completed by the end of June 2024.

**Budget:** N/A

**Motion:** **Move that the TAC recommends that the Board accepts the Cherry Creek Reach 1 Alternative Analysis prepared by Muller Engineering Company (May 10, 2024) provided that no major concerns are identified in the external peer review being conducted concurrently.**



## ACTION ITEM MEMORANDUM

**To:** CCBWQA Technical Advisory Committee (TAC)  
**From:** Elysa Loewen Pollution Abatement Project Manager  
**Date:** June 6, 2024  
**Subject:** Cherry Creek – Reservoir to Lakeview Drive (Reach 1)

**Request:** Move that the TAC Recommend the Board:

1. Contract directly with Muller Engineering for the Preliminary Design on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1), provided that no major concerns are identified during the external peer review process that will be completed in June 2024.
2. Authorize the preparation and execution of necessary consulting agreement,
3. and an expenditure of \$593,928.00.

**Background:** Muller Engineering Company (Muller) started their initial assessments of Cherry Creek in Cherry Creek State Park (CCSP) in 2020; their initial reports included *Cherry Creek Stream and Water Quality Assessment (2022)* and the *Cherry Creek Baseline Channel Monitoring Report (2022)* which identified Reach 1 (Reservoir to Lakeview Drive) as a priority reach of Cherry Creek within CCSP; these reports were accepted by the Board in December 2022. Muller attended a workshop in March of 2023 and demonstrated the importance of work on Reach 1 as a priority reach and after approval from the Board in April of 2023, began their alternative analysis.

After completing their analysis, Muller attended the April 2024 TAC meeting, where they presented their recommendations in detail and received feedback from the TAC. After the April 2024 TAC meeting, Muller incorporated the feedback received and finalized the *Cherry Creek Reach 1 Alternatives Analysis Report* in May 2024. Per direction by the Board in May, a peer review of the alternatives analysis is anticipated to be performed and completed by end of June 2024, and any feedback received will be incorporated into Muller's preliminary design moving forward. Alternatively, if any major concerns arise from the review, the scope and fee could be reevaluated.

**Project:** We are recommending moving forward with the Muller team to advance to a preliminary design (60%) for Cherry Creek Reach 1 in 2024. This would progress the design further than the original 2024 CIP that included only conceptual design (30%) in 2024. The benefits of moving forward with an expanded scope include:

- Developing more accurate opinion of probable construction cost for budgeting and potential grant pursuits.
- Furthering the teams understanding of the permitting requirements for permit submittal in 2025. Per comments received from USACE, the 408 permitting processes could take a minimum of 9 months to 1 year to gain approval.
- This keeps this high priority project moving forward without delays or breaks in Muller's design work.

**Budget:**

In April 2023, the TAC and Board moved forward with Muller’s scope and fee to provide alternative analysis (Phase 1) for an expenditure of \$256,715. Muller’s scope also included a cost to proceed with Conceptual Design 30% (Phase 2) for an additional expenditure of \$181,000 in 2024. However, as discussed previously, we have requested Muller to provide an expanded scope in 2024 to advance the design to Preliminary Design 60% and include upfront coordination for environmental permitting for a scope and fee of \$593,928.00.

CCBWQA’s Capital Improvement Program for 2024 includes an available budget which is adequate to move forward with Muller’s preliminary design scope and fee while still supporting current projects. The available budget utilizes original planned funding for the project and reallocations of other project funding that have had savings this year or delayed in 2024. The available budget includes:

- *Original 2024 Funding for Cherry Creek Reach 1*
- *Additional Funding from reduced 2024 contribution to Cherry Creek @ Arapahoe Rd Project*
- *Additional funding reallocated from 2024 contributions to Lone Tree Creek in CCSP downstream of Pond Project, which will be moved to future funding.*
- *Additional Funding from reallocating contribution for PRF Preservation, Acquisition, Lease of Land or Water in 2024.*
- *PAF Budget Contingency (if needed)*

**Alternative:**

Our alternative to not moving forward with this project (or no action) is the continued phosphorous loading directly to the reservoir, which was estimated to be 2,600lbs/year (based on data from 2013 to 2021) with the potential to increase to 4,400lbs/year with advancement of the current erosion.

**Motion:**

Move that the TAC Recommend the Board:

1. Contract directly with Muller Engineering for the Preliminary Design on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1), provided that no major concerns are identified during the external peer review process that will be completed in June 2024.
2. Authorize the preparation and execution of necessary consulting agreement,
3. and an expenditure of \$593,928.00.

May 31, 2024

Manager  
Cherry Creek Basin Water Quality Authority  
PO Box 3166  
Centennial, CO 80111

RE: Scope of Services for Cherry Creek Reach 1 Channel Reclamation: Preliminary Design

Dear Manager:

Muller Engineering Company, Inc. (Muller) would like to thank you for the opportunity to work with the Cherry Creek Basin Water Quality Authority (CCBWQA) to perform the preliminary design for Reach 1 of Cherry Creek located within Cherry Creek State Park beginning at Cherry Creek Reservoir and extending south approximately 6,500 feet to Lakeview Drive. The preliminary design will include the stabilizing the primary channel of Cherry Creek and a portion of the Shop Creek channel, floodplain stabilization of the secondary and tertiary flow paths, and design of a new primary culvert at the Lakeview Drive crossing along with flow control structures on the inlets of the existing culverts. It is the intent that the preliminary design will provide an ultimate design to stabilize Reach 1 and if budget is limited, there would be an option to shelve the floodplain stabilization and Lakeview Drive improvements and only move forward with the final design of the primary channel improvements. The preliminary design will include a conceptual level design submittal, prior to grading of the channel, to allow the project stakeholders a chance to review and provide feedback on the channel layout reducing the expense of re-doing the channel grading multiple times. The conceptual level layout will be developed based on a geomorphic assessment, one dimensional channel hydraulics, and a sediment transport continuity analysis. Preliminary design will follow the conceptual level submittal and will refine the channel layout based on feedback received during the conceptual design phase and will develop channel grading, a cut-fill balance, and a seeding plan ready to be included as part of USACOE Section 404 and 408 permit applications that will be submitted in the final design phase.

It is anticipated that a final design phase will follow the preliminary design. The scope of work for final design will be determined at the end of the preliminary design when more is known about the project budget and the potential for grant funding.

The following sections outline the scope, fee, assumptions, and schedule for preliminary design.

## A. Scope of Work

The scope of work will include the following items summarized below:

### 1. General Consulting Services

The following general services tasks are included in the scope of work:

- **Project Management:** Muller will complete project setup, preparation of sub consultant agreements, and monthly invoicing.



- **Project Coordination:** Muller will complete as needed e-mail and phone coordination with CCBWQA.
- **Progress Meetings:** Muller will participate in bi-monthly virtual progress meetings with CCBWQA staff over an 9 month period.
- **TAC and Board Meetings:** Muller will attend and present at 1 in-person TAC meeting, and one in-person Board meeting. This effort will include preparation of a PowerPoint presentation of the project progress.

## 2. Conceptual Design (30%)

The following tasks are included in the scope of work for conceptual design:

- **Conceptual Design Development:** Muller will review and process survey base files and perform a site visit to assist in the refinement of the main channel, secondary/tertiary flow paths, and the Lakeview Drive culverts. A geomorphic assessment will be performed to develop a channel planform, profile, and cross section to match the valley type through Reach 1. A conceptual design will be developed by refining the Alternative 2 layout from the alternatives analysis. A one-dimensional hydraulic model of the primary channel will be created using HEC-RAS to assist with the sediment transport analysis and initial rock sizing of grade control structures. Up to three iterations of the HEC-RAS model have been assumed to refine the channel layout and optimize sediment transport. Muller will also coordinate with Verdantas on the sediment transport analysis and the three hydraulic model iterations.
- **Conceptual Channel Plans:** Muller will prepare a 30% conceptual level plan set with up to eighteen sheets including a title sheet, a site plan, up to eight grading plans showing approximate grading limits but no contours, three channel profile sheets, one typical channel section sheet, and up to four landscape sheets showing only the seeding zones.
- **Conceptual Construction Costs:** Muller will refine the construction quantities developed during the alternatives analysis and prepare a conceptual level engineer's opinion of probable construction costs using current bid prices gathered from recent similar projects.
- **Senior Quality Review:** Muller senior staff will perform a quality control review on the 30% layout, plans, and costs.
- **30% Design Review Meeting and Coordination with CCBWQA:** Muller will attend one 30% design review meeting with CCBWQA staff and other project stakeholders to present the 30% layout and cost estimate, answer any questions, and receive feedback and comments. This effort also includes coordination time for Muller to follow up and clarify any feedback or comments received.
- **Floodplain Stabilization: Secondary/Tertiary Flow Paths:** Muller will develop a conceptual layout for floodplain stabilization improvements along the secondary and tertiary flow paths. This effort will include a site visit to identify erosion and vulnerable areas, conceptual level rock sizing for grade control structures using a conceptual level SRH2D hydraulic analysis. The effort will also include the preparation of up to twelve 30% plan sheets including eight floodplain stabilization plans and four landscape plans. A conceptual level construction cost estimate will also be prepared for these improvements.
- **Lakeview Drive Improvements:** Muller will develop a conceptual level layout of the proposed culvert under Lakeview Drive, culvert inlet structures for flow control, a raised

roadway profile to accommodate the new culvert, and protection of the downstream roadway embankment. Six 30% plan sheets will be created including two Lakeview Drive Plan and Profile sheets, one culvert plan and profile sheet, one guide bank layout plan, and two landscape plan sheets. A conceptual level construction cost estimate will also be prepared.

- **Environmental Permitting:** Muller will coordinate with ERO, CCBWQA, and USACOE on Section 404 and Section 408 permits including pre-application meetings with the USACOE, and up to four meetings with the internal team as well as phone and e-mail coordination.

### 3. Preliminary Design (60%)

The following tasks are included in the scope of work for preliminary design:

- **Preliminary Design Development:** Muller will refine the 30% level design based on feedback from the CCBWQA and other project stakeholders to prepare preliminary primary channel layouts. The one-dimensional HEC-RAS model will be refined using the final layout and grading to assist with final sediment transport calculations and preliminary rock sizing of grade control structures. The conceptual level SRH2D model will also be refined to reflect the final layout and grading.
- **Preliminary Channel Grading and Cut/Fill Balance:** Muller will create a preliminary grading plan for the primary Cherry Creek and Shop Creek channels including a grading plan to fill the existing eroded channel. A cut-fill balance will then be performed on the preliminary channel grading including up to three iterations to achieve a cut fill balance that meets the requirements for the USACOE Section 408 permit.
- **Preliminary Channel Plans:** Muller will refine the 30% plan set to create a preliminary 60% level plan set with up to twenty-two sheets including a title sheet, a site plan, up to eight grading plans, three channel profile sheets, two typical channel section sheets, three sheets for typical riffle and bank protection details, and up to four landscape sheets showing only the seeding zones.
- **Preliminary Construction Costs, Water Quality Assessment, and Design Report:** Muller will refine the construction quantities developed during the 30% design and prepare a preliminary level engineer's opinion of probable construction costs using current bid prices gathered from recent similar projects. Water quality and phosphorous reduction estimates developed previously will be refined based on the preliminary design layout. A preliminary design report will be prepared to document the design assumptions and calculations including the cut and fill balance documentation required for the USACOE 408 permit, and the water quality benefits.
- **Senior Quality Review:** Muller senior staff will perform a quality control review on the 60% layout, plans, and costs.
- **60% Design Review Meeting and Coordination with CCBWQA:** Muller will attend one 60% design review meeting with CCBWQA staff and other project stakeholders to present the 60% layout and cost estimate, answer any questions, and receive feedback and comments. This effort also includes coordination time for Muller to follow up and clarify any feedback or comments received.
- **Floodplain Stabilization: Secondary/Tertiary Flow Paths:** Muller refine the 30% design to develop a 60% layout for floodplain stabilization improvements of the secondary and



tertiary flow paths. This effort will include refining rock sizing for grade control structures using the SRH2D hydraulic analysis. The effort will also include the preparation of up to twelve 60% plan sheets including eight floodplain stabilization plans and four landscape plans. A preliminary level construction cost estimate will also be prepared for these improvements.

- **Lakeview Drive Improvements:** Muller will refine the 30% design to develop a preliminary level layout of the proposed culvert under Lakeview Drive, culvert inlet structures for flow control, a raised roadway profile to accommodate the new culvert, and protection of the downstream roadway embankment. Six 60% plan sheets will be created including two Lakeview Drive Plan and Profile sheets, one culvert plan and profile sheet, one guide bank layout plan, and two landscape plan sheets. A preliminary level construction cost estimate will also be prepared.
- **Environmental Permitting:** Muller will coordinate with ERO, CCBWQA, and USACOE on Section 404 and Section 408 permits including pre-application meetings with the USACOE, and up to four meetings with the internal team as well as phone and e-mail coordination.

#### 4. Special Services

The following special services are included in the scope of work:

**Detailed Ground Survey:** Topographic Land Surveyors will perform detailed ground survey of a 100-foot swath along the new channel alignment, and detailed ground survey of the existing degraded channel from bank to bank.

**Subsurface Utility Engineering:** Topographic Land Surveyors will perform a quality level A and B subsurface utility engineering investigation to locate and identify the depth of the Aurora water distribution lines and the water and sanitary service lines running beneath Lakeview Drive.

**Ecology and Environmental Permitting:** ERO will perform general permitting and ecological consultation with the project team through 60% design. This effort includes general coordination with the USACOE and the project team, including two pre-application meetings, for the USCOE Section 404 and 408 permits. Wetland mapping will be performed to help inform the design team on wetland mitigation requirements and a mitigation plan. This effort also includes that the project is in compliance with the Endangered Species Act and the Bald and Golden Eagle Protection Act.

**Cultural Resources:** ERO will work with the project team to ensure the project is in compliance with Section 106 of the National Historic Preservation Act including performing a cultural resource file search and literature review, definition of the area of potential impacts, class III survey and exploratory testing, and coordination and submittal to the USACOE who will coordinate with SHPO for cultural resources clearance.

**Sediment Transport Continuity Analysis:** Verdantas will complete a sediment transport continuity analysis of the Reach 1 layout and bankfull channel sizing. This effort will also include an upstream geomorphology analysis to understand sediment supply.

## 5. Deliverables

The following deliverables are included in the scope of work:

- ***Conceptual Level (30%) Plan Set***
- ***Conceptual Level (30%) Construction Cost Estimate***
- ***Preliminary Level (60%) Plan Set***
- ***Preliminary Level (60%) Construction Cost Estimate***
- ***Preliminary Level (60%) Design Report***

## B. Assumptions and Exclusions

The following is a list of assumptions and exclusions used in preparation of this scope and fee:

- The project includes reclamation of approximately 4,800 LF of Cherry Creek and 900 LF of Shop Creek within Cherry Creek State Park assuming Alternative 2, moving the primary channel east, presented in the Cherry Creek Reach 1 Alternatives Analysis.
- The duration of this preliminary design scope is assumed to be 9 months.
- Geotechnical services are not included in this scope of work.
- The submittal of USACOE Section 404 and 408 permit applications are not included in this scope of work but will be included during the future final design phase.
- A detailed ground survey of a 100-foot swath along 4,800 feet of the proposed primary channel alignment and detailed survey of the eroded existing channel spanning from eroded bank to eroded bank will be completed in the summer of 2024 using total station survey equipment below the tree canopy and GPS equipment in areas outside of the tree canopy.
- The installation and monitoring of groundwater wells are not included in this scope and fee. However, installation of groundwater wells would provide valuable groundwater elevations through Reach 1 allowing the design team to more accurately determine planting zones and ensuring that moving the channel east will not adversely impact the existing vegetation along the degraded channel.
- It is assumed that a floodplain permitting and a CLOMR/LOMR will not be required for the channel work through Reach 1 since this area is within the probable maximum flood pool of the reservoir and therefore is not regulated by a FEMA floodplain.
- Utility relocations are anticipated under the new Lakeview Drive culverts. It is assumed that utility relocation plans will be developed during the future final design phase.
- Geometric layout of the plan and profile for the Lakeview Drive culvert is included with the 60% design plans. Structural detailing of the culvert including headwall, wingwall, box culvert, and rebar design are assumed to be included in the final design phase.
- Geometric layout of the culvert inlet flow control structures is included with the 60% scope of work. Structural detailing of the inlet structures is assumed to be included in the final design phase.
- An approximate layout of the raised Lakeview Drive profile is included in the 60% design scope. A formal geometric profile and asphalt design for Lakeview Drive is anticipated to be included during the future final design phase.

### C. Fee

We estimate that the fee associated with this scope of work will not exceed **\$593,928**. Below is a breakdown of the fee:

Task	Muller	Topographic	ERO	Verdantas	Total
General Consulting Services	\$37,908	-	-	-	\$37,908
Conceptual Design (30%)	\$158,739	-	-	-	\$158,739
Preliminary Design (60%)	\$212,990	-	-	-	\$212,990
Special Services	-	\$65,235	\$54,221	\$64,835	\$184,291
<b>Sub Total</b>	<b>\$409,637</b>	<b>\$65,235</b>	<b>\$54,221</b>	<b>\$64,835</b>	
<b>Total Fee</b>					<b>\$593,928</b>

Detailed project fee estimates from Muller and our subconsultant partners are attached and provide a breakdown of anticipated staff time by task and a schedule of 2024 hourly rates.


### D. SCHEDULE

We anticipate completing the conceptual and preliminary design phase in approximately 9 months after receiving the notice to proceed. A more detailed schedule outlining design time and project milestones will be prepared and coordinated with the Cherry Creek Basin Water Quality Authority at the beginning of the project.

We look forward to working with you and assisting the Cherry Creek Basin Water Quality Authority with this preliminary design. If you have any questions or concerns related to the scope and fee, please don't hesitate to call.

Sincerely,

MULLER ENGINEERING COMPANY, INC.



John Yager  
Water Resources Project Manager



Derek Johns  
Principal

Enclosures (Muller, Topographic Land Surveyors, ERO, and Verdantas Fee Estimates)

CC: CCBWQA Manager (Jane Clary, Elysa Loewen, and Val Endyk)









**CHERRY CREEK REACH 1**

Wednesday, May 22, 2024

**MULLER ENGINEERING**

**CODY VOLT, P.E.**

Project Engineer  
 crvolt@mullereng.com  
 D: 303.268.0339 | C: 970.531.0296

Section 12, T5S, R67W  
 39.629560°/-104.836825°  
 City of Aurora, County of Arapahoe, Colorado

**SCOPE OF WORK:**

- Project setup and client coordination.
- Research public records for surveys of record, utilities, maps by others, and survey control.
- Recover and/or establish a minimum two horizontal and vertical survey control points, for future design and construction layout. - Survey datum NAD83 and NAVD88, unless otherwise specified by client.
- Field survey boundary lines and existing conditions. (See Exhibit A)
- Prepare field sketches and pictures.
- Process field survey data.
- Prepare topographic design survey showing all physical features including trees with caliper, 1' contours, and spot elevations.
- Provide copies of site pictures, research data and field sketches.
- Provide final electronic files in AutoCAD 2020 format. Provide CAD files with model space layout only, at an annotative scale specified by the client.

TASK 1	Hours	Rate	Cost
Project management and preparation for field surveys	4	130	\$520.00
Field Surveys - recover/establish horizontal and vertical site control	3	165	\$495.00
Field surveys - ground truthing for 2021 LiDAR data	9	165	\$1,485.00
Process field data - prepare base drawing files	2	130	\$260.00
Prepare deliverable	3	110	\$330.00
PLS Review	1	175	\$175.00
		Mileage/Materials	\$50.00
		<b>TASK 1 TOTAL</b>	<b>\$3,315.00</b>

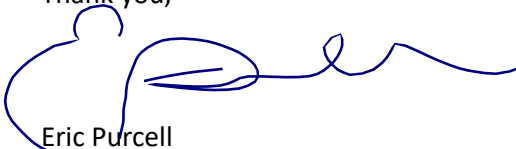
TASK 2	Hours	Rate	Cost
Project management and preparation for field surveys	10	130	\$1,300.00
Field surveys - Ground survey of existing channel and proposed channel	85	190	\$16,150.00
<del>Field surveys - Ground survey of existing channel and proposed channel</del>	<del>55</del>	<del>190</del>	<del>\$10,450.00</del>
Field surveys - Ground survey of Lakeview Drive	5	190	\$950.00
Process field data	8	130	\$1,040.00
Prepare design survey deliverable	20	110	\$2,200.00
PLS Review	4	175	\$700.00
	Mileage/Materials		\$450.00
Aerial LiDAR Mapping	Est		\$15,145.00
	<b>TASK 2 TOTAL</b>		<b>\$37,935.00</b>
	<del>TASK 2 TOTAL</del>		<del>\$32,235.00</del>
Use of Total Station in/along creek channel			
<del>Use of GPS in/along creek channel</del>			

TASK 3 - SUE QLB and QLA Investigation	Hours	Rate	Cost
<i>Quality Level B</i>			
Project management and preparation for field surveys	4	130	\$520.00
Underground Utility Locates (by others)	Est		\$1,770.00
Field surveys - Ground survey of located utilities	9	165	\$1,485.00
Review survey data against utility locate data, maps and information	10	110	\$1,100.00
Update Design Survey and Prepare SUE QLB Plan Set	6	110	\$660.00
PE - SUE Review	8	165	\$1,320.00
	<i>QLB SUBTOTAL</i>		<i>\$6,855.00</i>
<i>Quality Level A</i>			
Project management and preparation for field surveys	6	130	\$780.00
12 pothole locations (by others)	Est		\$10,645.00
Subcontractor Oversight and Pothole Documentation	27	165	\$4,455.00
Update SUE plan set to QLA	4	110	\$440.00
PE - SUE Review	4	165	\$660.00
	Mileage/Materials		\$150.00
	<i>QLA SUBTOTAL</i>		<i>\$17,130.00</i>
	<b>TASK 3 TOTAL</b>		<b>\$23,985.00</b>

**Notes:**

1. Horizontal control, vertical control and site survey control will be with RTK GPS methods. Vertical accuracy expected  $\pm 0.05'$ . Aerial mapping: Imagery GSD =  $\pm 3$ cm, LiDAR =  $\pm 225$  ppsm. Survey control based on NAD83 / NAVD88 datum unless otherwise specified.
2. This is not a boundary survey.
3. No underground private utility locating is provided for. Utility locates will be provided by a third-party consultant marking only Tier 1 and Tier 2 utilities as discovered by an 811 Ticket. Nonmetallic pipelines without a tracer wire cannot be located. Topographic would need the utility owner to mark these lines. For engineering utility calls to 811 (such as in this case), it is rare for the utility owner to come out and mark their equipment, usually only maps, sketches and / or drawings are sent. Topographic will show unmarked utilities based on any information provided and mark them as Quality Level C or D. Topographic will locate manholes, inlets and other structures and will show the type, size and invert of the pipe if it is possible to see from looking in the manhole, inlet or structure, if accessible. Sometimes the lids are locked and / or seized shut. Topographic will not damage the utility if it does not readily open, the utility owner would need to come out and open the utility. For safety reasons, our crews are instructed not to enter any of the manholes or vaults.
4. The aerial mapping estimate does not include re-routes outside the established flight path/corridor limits (~200-ft each side of corridor centerline), atypical drawing requests, survey permissions, etc. Areas obscured by foliage, vegetation, or shadows will be defined to indicate that detail in these areas is approximated and may not be reliable. Such areas will be field checked and verified. Inclement weather (wind, snow, precipitation) will require rescheduling of acquisition flight at the earliest time available and a subsequent extension of deliverable timeframe.
5. Pothole estimates are based on an approximate average of completing five (5) potholes per day. Subsurface conditions are unknown and may affect the total number of potholes completed per day. The cost estimates shown are for budget approximation only and may not reflect the final costs needed to complete the subsurface utility investigation and fulfill requirements per ASCE 38. Cost estimate provided is for trailer mounted vacuum equipment with an approximate maximum clearance depth of ten (10) feet below grade for wet utilities and six (6) feet below grade for dry utilities.
6. Owner contact and coordination not included.
7. Research by Topographic does not take the place of a title report or title opinion. Easements and other encumbrances may not be shown unless a title report is supplied.
8. The cost and scope of work is open to negotiations and revisions. Additional items not covered in the above scope may be required and is not provided for herein. Any additional services will be at clients' direction, with additional service orders issued, if desired by client.
9. We fully expect the above cost will cover the services described in the scope of work, however situations may arise that are beyond expectations. Therefore, no guarantee is made or implied.
10. The cost and scope is valid for 60 days.

Thank you,



Eric Purcell  
For and on behalf of  
**Topographic, Co.**

**ACCEPTED**

By:

Signature:

Title:

Date:





**DBE/SBE/M/WBE Certified**

**Utility Locating  
Hydro Vac Excavation  
Directional Drilling  
Sub Surface Utility Engineering (SUE)**



**Diversified Underground, Inc.**

2300 Cavanaugh Road  
Watkins, Colorado 80137  
www.diversifiedunderground.com  
Email : zack@duinc.work  
Cell : (720) 451-9125

## Cherry Creek State Park Locates

<b>Prepared For</b>  <b>Zac Keating</b> with <b>Topographic Land Surveyors</b> 520 Stacy Court B Lafayette, Colorado, 80026	<b>Quote #</b>  <b>Quote Date</b>  <b>Estimator</b>  <b>Amount</b>	<b>1043430407</b>  <b>05/15/2024</b> (Valid for 90 days)  <b>Zackary Allen</b>  <b>\$1,770.00</b>
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**Scope of Work :** \*\*Use heavy flagging for project due to a lot of trees\*\*

At a point 2,545ft W of the NW corner at S Parker Rd & E Belleview Ave begin locating S 1,150ft, then W 1,230ft, then W/NW 2,765ft, then NW 3,590ft, then NE 4,070ft, then E 2,460ft, then S 5,245ft back to start point to include everything inside this area. See site map

**Estimated time on-site :** {EstimateCustomFields.Value:Time\_On-Site}

**Exclusions :** Sewer Laterals, Prevailing Wages, or GPR

**Storm & Sanitary :** Storm & sanitary will only be located upon request, this excludes sanitary laterals. Due to the inability to electronically locate sewer lines (Storm & Sanitary) there will be no on the ground/in Field markings performed between access points. We will however indicate with paint at all access points direction of travel of pipes as well as endeavor to provide city/municipality maps of the facilities. If requested we can perform line of site locates on sewer between access points but accept no liability of accuracy.

**Scheduling :** **UPON RECEIVING A SIGNED NTP OR EXECUTED CONTRACT, WORK WILL THEN BE SCHEDULED ACCORDINGLY.** If your company requires a PO#, Work Order#, Project# and/or Contract# in order to process payment, that information MUST be provided to Diversified at the time of NTP, otherwise, the work will NOT be scheduled.

### Estimate

Description	Qty	Rate	Total
<b>Engineering Utility Locates</b> L101 - Engineering Utility Locate - Hourly Rate Estimated Quantity. Actual hours on-site to be invoiced.	16.00	\$95.00	\$1,520.00
<b>Map &amp; Data Research</b> L103 Map & Data Only	1.00	\$250.00	\$250.00

**Estimate Total:**

**\$1,770.00**

## **Diversified Underground, Inc. - Terms and Conditions**

Acceptance of this Proposal is strictly limited to the terms of this Proposal and the standard terms and conditions contained herein, and any terms and conditions proposed by the Customer in any purchase order or other document of acceptance which alter or conflict with the terms contained herein are void and shall not constitute part of the Contract. All invoices are to be paid 30 days from the date of invoice. Any unpaid invoice shall accumulate interest at the rate of 18% per annum (1.5% per month). In the event Diversified Underground obtains the services of an attorney or a collection firm to recover any amounts owed under this Agreement, Customer will be responsible for all Diversified Underground's attorney's fees and costs including any, and all expert witness costs and fees, associated with its efforts of collection. Customer shall save and hold harmless Diversified Underground, its officers, agents and employees against all liabilities, including damages, fines, penalties, damage to property or injury or death of any person or persons arising out of, or in any way connected with or resulting from the work to be performed hereunder, including but not limited to such liability arising out of, or in any way connected with, or resulting from the acts, non-acts or omissions, negligence or alleged negligence of the Customer, its officers, agents, employees and other subcontractors and/or other third parties invited or brought to the project site by Customer, in the performance of the work set forth in this contract. Diversified Underground recognizes that any liability arising out of the sole and exclusive acts of negligence of Diversified Underground, its officers, agents and employees, shall be the responsibility of Diversified Underground. It is the responsibility of the client to ensure that all privately owned utilities are clearly identified and marked prior to the commencement of project. This is to include but is not limited to irrigation, sprinkler, electric, gas, sewer, water, communications or any other buried privately-owned facility. Any unmarked utility damaged from job performance shall be of no fault to the Company. Diversified Underground and Customer waive any and all claims against each other for any and all consequential damages arising out of or related to this agreement, including but not limited to damages for principal office expenses in compensation for personnel stationed there, loss of financing, loss of business, reputation and profits. This Contract shall be construed in accordance with the laws of the State of Colorado. Diversified Underground, Inc. makes every effort to be successful on every job, unfortunately, with some of the adverse ground conditions that exist in Colorado, there are a small percentage of jobs that cannot be completed due to these conditions. In the rare instance where the scope of work is unable to be completed due to adverse soil (or any other conditions outside of Diversified Undergrounds control) all work completed will be invoiced. This includes, but not limited to, mobilizations, pits, potholes, locates, permits and traffic control. Diversified Underground, Inc. will communicate any adverse conditions ahead of time. If there is a market increase in material cost after estimate has been accepted, both parties agree that the material cost increase will be covered and accepted via change order.

## HYDRO EXCAVATION

At Diversified Underground we work hard to hold on to our roots. To us diversity means not only having a versatile workforce, but it also means having the right tool for the job. In saying this, we realize that the most hydro-excavation projects can be done with smaller vac trucks – which are more economical and maneuverable, but sometimes digging conditions are extremely difficult with large rocks, hard soil, or a high water table – just to name a few. When you run into these difficult digging situations we also take care of you with our fleet of large vacuum units.

- UTILITY POTHOLING
- HYDRO TRENCHING
- CASSION EXCAVATION
- HYDRO JETTING

### BENEFITS OF HYDRO-VAC EXCAVATION:

- Provides a safer and more efficient method to excavate buried utilities.
- Enables a visual confirmation of surface locate marks.
- Minimizes ground disturbance and reduces site restoration costs.
- Eliminates the need for hand excavation, reducing damage to buried underground structures and possible worker injuries and tens of thousands of dollars in insurance claims.



## DIRECTIONAL DRILLING



Directional drilling can be a cost effective alternative to conventional trenching excavations. With our various sized drills, we are capable of installing products ranging from 1/4" diameter to 12" diameter. With directional drilling, there is no need to open excavate a trench to install a utility. This especially comes in handy when an underground utility needs to be installed across a road. A directional drill rig can be placed on one side of the road, which then a "pilot hole" is drilled horizontally under the road. Once this is completed, the product (Conduit, Pipe or Cable) is then connected to the drill rod, and pulled back to the drill rig. This is all done with minimal to no disruption of traffic.

## UTILITY LOCATES

- ENGINEERING LOCATES
- PRIVATE UTILITY LOCATES
- ELECTRIC LINE FAULT FINDING
- CONTRACT LOCATES
- SUB SURFACE UTILITY ENGINEERING (SUE)

Diversified Underground offers complete utility locating services for the identification and marking of public and privately owned underground utilities.

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**DBE/SBE/M/WBE Certified**

**Utility Locating  
Hydro Vac Excavation  
Directional Drilling  
Sub Surface Utility Engineering (SUE)**



**Diversified Underground, Inc.**

2300 Cavanaugh Road  
Watkins, Colorado 80137  
www.diversifiedunderground.com  
Email : zack@duinc.work  
Cell : (720) 451-9125

## Cherry Creek State Park Potholing

<p><i>Prepared For</i></p> <p><b>Eric Purcell</b> with <b>Topographic Land Surveyors</b> 520 Stacy Court B Lafayette, Colorado, 80026</p>	<p><b>Quote #</b></p> <p><b>Quote Date</b></p> <p><b>Estimator</b></p> <p><b>Amount</b></p>	<p><b>1043783036</b></p> <p><b>05/20/2024</b> <i>(Valid for 90 days)</i></p> <p><b>Zackary Allen</b></p> <p><b>\$8,645.00</b></p>
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**Scope of Work :** Client requested 12 potholes inside Cherry Creek State Park. Exact locations will be directed onsite or premarked prior to start of work  
 \*\*5 hour minimum to be billed per site visit\*\*  
 QUOTE DOES NOT INCLUDE PREVAILING WAGE  
**Bid for : Trailer Mount Vac Unit**  
**Backfill Required : Yes**

**Exclusions :** Hot patch, Flo-fill, Pre-Marking Pothole Locations, Prevailing Wage, Removal of any decorative hard surface, Night/Weekend Work, and Unforeseen Adverse Soil Conditions, Attenuator Truck for Traffic Control, Flaggers/Police. Contaminated Spoils Disposal. \$85/hr + standard mobilization rate per day/truck applies for additional requests including mandatory "all-hands" safety meetings, and pre-marking pothole locations (non-survey grade) if applicable/requested.  
**Scheduling :** **UPON RECEIVING A SIGNED NTP OR EXECUTED CONTRACT, WORK WILL THEN BE SCHEDULED ACCORDINGLY.** If your company requires a PO#, Work Order#, Project# and/or Contract# in order to process payment, that information MUST be provided to Diversified at the time of NTP, otherwise, the work will NOT be scheduled.

Estimate				
Description	Qty	Rate	Tax	Total
<p><b>Hydro Vacuum Excavation (Hourly)</b> H300 Per Hour Hydro Vacuum Excavation (Per Hour, On Site)</p> <p>Diversified Dig Limit Standard : Potholes on Wet Utilities will be excavated until target utility is exposed or a depth of 10 feet has been reached. Potholes on Dry Utilities will be excavated until target utility is exposed or a depth of 6 feet has been reached.</p>	21.00	\$190.00	\$0.00	\$3,990.00
<p><b>Equipment Mobilization</b> H301</p>	3.00	\$325.00	\$0.00	\$975.00
<p><b>Permit Coordination "Per Permit"</b> H306</p>	1.00	\$480.00	\$0.00	\$480.00
<p><b>Permits</b> H304 **Actual cost of permit will not be known until permit is issued** After receiving notice to proceed, please allow 15 business days for permit submittal/approval and scheduling. All permits will be invoiced at cost +10% up to \$5,000. Any permit over \$5,000 will be billed at cost + 20%. Client has the option to pay for any permit directly and forego any markup. Permit coordination fees apply to either option.</p>	1.00	\$0.00	\$0.00	\$0.00
<p><b>Traffic Control Plan(s) (Per Sheet)</b> H312</p>	2.00	\$100.00	\$0.00	\$200.00
<p><b>Traffic Control</b> H302 If T.C. Plans/Permit requires equipment/staffing outside of our internal capabilities (including our internal scheduling</p>	3.00	\$1,000.00	\$0.00	\$3,000.00

capabilities), then T.C. will be sub-contracted out and invoiced at cost + 10%. Backup documentation is available upon request.

**Estimate Total:**

**\$8,645.00**

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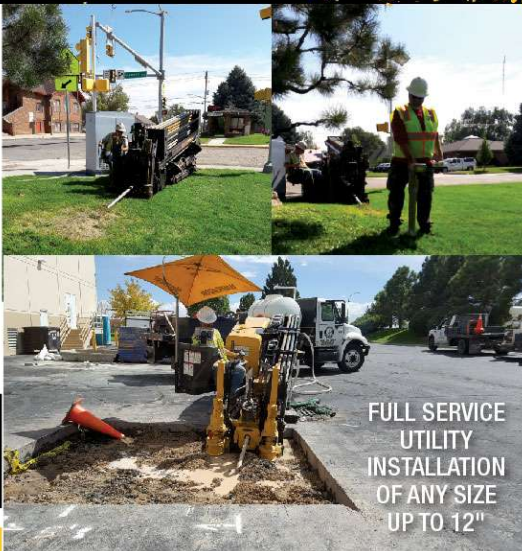
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May 29, 2024

Mr. John Yager  
Muller Engineering, Inc.  
7245 West Alaska Drive, Suite 300  
Lakewood, Colorado 80226

**RE:** Cherry Creek Reach 1 at Cherry Creek Reservoir, Arapahoe County, Colorado  
Scope of Work

Dear Mr. Yager,

ERO Resources Corporation (ERO) is pleased to provide the following scope of work to assist Muller Engineering, Inc. with ecological and cultural services for the Cherry Creek Reach 1 at Cherry Creek Reservoir project in Arapahoe County, Colorado.

ERO Resources Corporation (ERO), a Colorado Corporation, will conduct the work for Muller Engineering, Inc. (hereinafter referred to as the Client). ERO will conduct this work on a times-and-materials basis for a cost not to exceed of \$54,221.00. If you have any questions, I can be reached at [mworah@eroresources.com](mailto:mworah@eroresources.com) or (303) 830-1188. ERO appreciates the opportunity to assist you.

Sincerely,



Moneka Worah  
Natural Resource Specialist/Principal

Attachments



# ERO Resources Corporation

## Scope of Work for

### Cherry Creek Reach 1 at Cherry Creek Reservoir

#### Arapahoe County, Colorado

May 29, 2024

### Summary

Muller Engineering, Inc. (Client) has asked ERO Resources Corporation (ERO) to prepare this Scope of Work (SOW) to perform the environmental services discussed below for the Cherry Creek Reach 1 at Cherry Creek Reservoir project in Arapahoe County, Colorado. ERO will perform the following tasks to assist the Client in environmental clearances necessary for the project.

The proposed project will likely require a Clean Water Act (CWA) Section 404 permit from the U.S. Army Corps of Engineers for the proposed project. As part of obtaining Section 404 CWA permit authorization from the Corps, the project must also comply with the Endangered Species Act (ESA) and National Historic Preservation Act (NHPA). This SOW outlines the tasks associated with the anticipated permitting of the project.

### Task 1. Identify and Map Wetlands, Open Water, and Channels

ERO will delineate all wetlands, open waters, and channels within the project area that may be under U.S. Army Corps of Engineers (Corps) jurisdiction through Section 404 of the Clean Water Act. Wetlands will be delineated following the methods in the revised online version of the Corps' Wetland Delineation Manual (1987) and the appropriate regional supplement. Open water and channels will be determined based on the presence of an ordinary high water mark as defined in 33 CFR Part 328. ERO will map the boundaries of wetlands, open water, and channels to submeter accuracy using a Global Positioning System (GPS) unit or, when appropriate, boundaries will be mapped onto an appropriately scaled aerial photograph. ERO will incorporate the wetland boundaries into project base mapping provided by the Client and will send the Client a revised base mapping file that includes a layer with the boundaries of wetlands, open water, and channels.

### Task Products

- Electronic file with boundaries of wetlands and open water delivered to the Client via email.
- Routine wetland determination forms in PDF format delivered to the Client via email.

### Task Assumptions

- Performing the delineation is weather dependent. The ground must be free of snow, and in most instances, the soils must be unfrozen to collect the needed soil data.
- The Client will provide topographical survey mapping data and/or aerial photography.
- The Client will arrange and provide written permission to access the project area.

- Changes to the boundaries of the project area will require additional effort and ERO will coordinate with the Client to determine if changes in the scope or budget are necessary.
- The routine method of areas equal to or less than 5 acres in size will be used. If the Corps requires the method for areas greater than 5 acres in size, a new scope will be prepared.

## **Task 2. Endangered Species Act Habitat Mapping**

Based on ERO's current knowledge of the area, potential habitat for Preble's meadow jumping mouse (Preble's), a federally threatened species, is present in the project area. In addition, habitat may be present for the tri-colored bat (TCB), a candidate species that may become officially listed in fall 2024. During activities performed under Task 1, ERO will assess habitat conditions within the project area. This will include mapping habitat quality and condition in the project area based on vegetation characteristics. ERO will provide the Client with a map of identified Preble's and TCB habitat.

### **Task Products**

- Map of suitable habitat by quality and condition.

### **Task Assumptions**

- This task does not include any presence/absence surveys for listed species.

## **Task 3. Cultural Resource Services**

Clean Water Act Section 404 and 408 authorization will require compliance with Section 106 of the National Historic Preservation Act (NHPA). ERO will coordinate with the Corps early in the process to define the area of potential effects (APE).

ERO will conduct a required cultural resource file search and literature review with the Office of Archaeology and Historic Preservation (OAHP) to identify previous cultural resource inventories and documented cultural resources in the Corps-defined APE. A file search will also be conducted with the lead federal agency, if one is involved and maintains records separate from OAHP. Additional records will be consulted, including general land office records, historical maps, and historical aerial imagery to identify potential unknown resources.

Preliminary review indicates that undisturbed areas are present in the project area and the Corps will require a Class III survey and exploratory testing. ERO will conduct an intensive Class III cultural resource survey of the APE that conforms to the Secretary of the Interior's (SOI) Guidelines for Identification and by supervisory personnel that meet the SOI Professional Qualification Standards. This task will involve one or more archaeologists walking systematic transects to identify unknown cultural resources in the APE. Resources identified during Task 1 will be reevaluated under this task, if necessary.

Identified cultural resources will be documented on relevant OAHP site forms, mapped, photographed, and located using a submeter Trimble DA2 with Trimble Catalyst Service positioning system (GPS) unit. Each identified resource will be assessed for its eligibility to be listed in the National Register of Historic Places (NRHP) per 36 Code of Federal Regulations (CFR) 60.4 of the National Historic Preservation Act (NHPA, 1966, as amended).

**Task Products**

- Draft report and OAHP forms delivered to the client via email.
- Final digital report, OAHP forms and accompanying files delivered to client and appropriate agencies.

**Task Assumptions**

- Ground conditions must be 80 percent free of snow and any pedestrian survey areas and access roads must be dry to initiate survey. These stipulations are required by the State Historic Preservation Officer (SHPO) and federal agencies.
- The number and complexity of cultural resources within the APE can substantially affect the level of effort to adequately document and evaluate the resources. ERO's cost estimate assumes four cultural resources will be in the APE. If more than four resources are encountered, ERO will contact the Client after the survey is completed to negotiate a new cost estimate.
- Evaluative testing and treatment of historic properties, if needed, will be conducted under a separate SOW.
- APE is approximately about 130 acres.
- Twenty exploratory shovel tests are sufficient to evaluate undisturbed landforms.
- ERO assumes one round of edits for the draft report and one round of edits for the final report.
- The Client will provide access through all lands within the APE, including gates or providing right-of-entry to facilitate access.
- ERO assumes that the Corps will conduct SHPO/THPO consultation.

**Task 4. Mitigation, Revegetation, Design Assistance**

An ERO ecologist will work with the Client to minimize impacts to wetlands and riparian habitat as much as possible. ERO will coordinate with the Client and project team to develop ecological goals and restoration strategies to meet Corps required wetland and stream mitigation, and to address overall site enhancement and restoration of the ecological conditions within the project area. ERO's ecologist will meet with the project team during design to discuss the channel alignment and cross section, bank stabilization treatments, and proposed approaches for wetland and riparian establishment. This would include providing alternatives that would minimize impacts to high-quality vegetation and wildlife habitat and would aim to provide the most lift and creation of wetland and riparian habitats.

ERO will prepare a high level preliminary revegetation and mitigation plan, including recommended species and wetland and riparian zones.

**Task Products**

- Revegetation recommendations delivered to the Client via email.
- Input into the overall design and mitigation plan.

**Task Assumptions**

- This task does not include a detailed planting plan, which can be developed in a future scope of work.
- This task does not include any topsoil testing as this will be covered in future scopes of work.

## Task 5. Project Management, Coordination, and Meetings

This task includes items specifically associated with contract and project management services through the duration of the contract, such as project start-up documentation, health and safety plan compliance, monthly invoicing, and project close-out documentation. This task also includes attending up to eight progress meetings with the Client and project team, two meetings with the Corps to discuss permitting approach, and three additional meetings with the Client. This task also includes ensuring that all documents and figures are reviewed for technical and editorial accuracy.

### Task Products

- Attend up to eight progress meetings with the project team.
- Two meetings with the Corps
- Three internal meetings with the Client.

### Estimated Costs

The above Tasks 1 through 5 will be completed on times and materials basis for a cost not to exceed of \$54,221.00, (see below for breakout), including expenses billed at cost plus 8%.

Task 1.	Identify and Map Wetlands, Open Water, and Channels	\$14,496.00
Task 2.	Endangered Species Act Habitat Mapping	\$6,866.00
Task 3.	Cultural Resource Survey and Report	\$16,032.00
Task 4.	Mitigation, Revegetation, and Design Assistance	\$6,798.00
Task 5.	Project Management, Coordination, and Meetings	\$10,028.00
	<b>Subtotal</b>	<b>\$54,221.00</b>

**ERO Cost Proposal - Cherry Creek Reservoir Reach 1 Arapahoe County, Colorado**

<b>Labor Category</b>	<b>2024/ Unit Rate</b>	<b>Task 1 - Identify and Map Wetlands, Open Water, and Channels</b>	<b>Task 2 - Endangered Species Act Habitat Mapping</b>	<b>Task 3 - Cultural Resources</b>	<b>Task 4 - Mitigation and Revegetation Assistance</b>	<b>Task 5 - Project Management, Coordination, and Meetings</b>	<b>Labor Hours Total</b>	<b>Totals</b>
Senior Principal	\$228.00		2			4	6	\$1,368
Project Principal	\$209.00	8	4		6	24	42	\$8,778
Biologist I	\$161.00	32	16		8	16	72	\$11,592
Biologist II	\$132.00				24		24	\$3,168
Staff Biologist	\$113.00	40	16				56	\$6,328
GIS Specialist I	\$136.00	16	6	8	8		38	\$5,168
Cultural Resource Principal Investigator	\$191.00			15		4	19	\$3,629
Project Cultural Resource Specialist III	\$100.00			61			61	\$6,100
Staff Cultural Resource Specialist II	\$83.00			40			40	\$3,320
Cultural Resource Technician	\$65.00			30			30	\$1,950
Word Processing/Editor	\$114.00			2			2	\$228
Administrative Staff	\$95.00					8	8	\$760
<b>Total Labor Hours</b>		96	44	156	46	56	398	
<b>Total Labor</b>		<b>\$13,520</b>	<b>\$6,492</b>	<b>\$15,551</b>	<b>\$6,798</b>	<b>\$10,028</b>		<b>\$52,389</b>
<b>Expenses</b>	<b>Unit Rate</b>	<b>Task 1 - Identify and Map Wetlands, Open Water, and Channels</b>	<b>Task 2 - Endangered Species Act Habitat Mapping</b>	<b>Task 3 - Cultural Resources</b>	<b>Task 4 - Mitigation and Revegetation Assistance</b>	<b>Task 5 - Project Management, Coordination, and Meetings</b>	<b>Totals Quantities</b>	<b>Totals</b>
Field Equipment Charges	\$10.00	3	2				5	\$50
Mileage	\$0.677	150	100	200			450	\$305
Photocopy (color/8.5x11)	\$0.30	50	20				70	\$21
Photocopy (b&w/8.5x11)	\$0.15	50	20				70	\$11
File search fee	\$30.00			2			2	\$60
GPS Rental (per day)	\$125.00	6	2	2			10	\$1,250
<b>Total Expenses</b>		<b>\$904</b>	<b>\$347</b>	<b>\$445</b>	<b>\$0</b>	<b>\$0</b>		<b>\$1,696</b>
8% markup		<b>\$72</b>	<b>\$28</b>	<b>\$36</b>	<b>\$0</b>	<b>\$0</b>		<b>\$136</b>
<b>Total estimated costs</b>		<b>\$14,496</b>	<b>\$6,866</b>	<b>\$16,032</b>	<b>\$6,798</b>	<b>\$10,028</b>		<b>\$54,221</b>

John Yager, PE, CFM  
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Lakewood, CO 80226  
303-988-4939  
jyager@mullereng.com

## Scope of Work and Cost Estimate to support preliminary channel improvement designs for Reach 1 in Cherry Creek State Park

Verdantas is pleased to provide the following Scope of Work and cost estimate to provide technical support to Muller Engineering in the development of a preliminary level design for channel improvements along Reach 1 of Cherry Creek within Cherry Creek State Park.

### Scope of Work

The scope of work to provide support on the development of a preliminary level design along Reach 1 of Cherry Creek with Cherry Creek State Park includes the following tasks:

#### Task 1: Project Kickoff

- a) Project setup
- b) Participate in 2-hr virtual kickoff meeting

#### Task 2: Review of Information

- a) Review of available information
- b) Review of previous studies and design alternatives

#### Task 3: Site Visits:

- a) Prepare for and participate in up to two site visits of the project reach.

#### Task 4: Conceptual Channel Design Support

- a) Review latest 2-D hydraulic model results for preferred alternative, with particular focus on flow distribution along and across Lakeview Road.
- b) Review channel profile, cross-sectional shape, and alignment for preferred alternative.
- c) Prepare for and participate in up to two 2-hr virtual workshops with Muller to discuss and develop conceptual refinements to preferred design alternative.

#### Task 5: Sediment Transport Estimates

- a) Estimate sediment transport capacities at up to 6 discharges and up to 5 key locations based on up to 2 proposed design conditions represented in 1D hydraulic models provided by Muller and previously identified sediment gradations.
- b) Estimate sediment transport capacities at up to 4 discharges and up to 5 key locations based on up to 2 proposed conditions represented in 2D hydraulic models provided by Muller and previously identified sediment gradations.



- c) Sediment transport evaluations will be focused on relative continuity concepts as it relates to channel stability and will not address potential phosphorous loadings to reservoir.

Task 6: Refined Channel Design Support

- a) Review results of up to 2 rounds of 1-D sediment transport estimates for developed design and discuss potential design modifications with Muller.
- b) Review 2-D hydraulic model results for developed design.
- c) Review results of up to 2 rounds of 2-D sediment transport estimates for developed design.
- d) Prepare for and participate in up to two 2-hr virtual workshops with Muller to develop final refinements to preliminary design.

Task 7: Preliminary Design Report

- a) Develop report text that summarizes methods and results of sediment transport analysis for final version of preliminary design. Text will be provided to Muller for insertion into overall design report.

Task 8: Client Meeting:

- a) Prepare for and participate in up to two virtual client meetings and one in-person 2-hr client meeting.

**Cost Estimate**

Verdantas proposes to complete the identified scope of work above on a time-and-material-basis, not to exceed \$64,835 without written authorization from Muller Engineering. A breakdown by task is provided in **Attachment A**.

Thank you for the opportunity to provide this proposal. If you have any questions, please do not hesitate to contact me at 970-852-6036 (office), 970-294-5242 (cell), or [cmorris@verdantas.com](mailto:cmorris@verdantas.com).

Sincerely,

Verdantas


Chad Morris, PE, CFM

Project Manager

[cmorris@verdantas.com](mailto:cmorris@verdantas.com)



## Attachment A: Cost Estimate

		PM / Sr. Consultant	Senior Hyd Eng II	Senior Hyd Eng	Hyd. Eng. III	Hyd. Eng. II	Sr. CAD / GIS	Word Processor/ Clerical	TOTAL HOURS	Labor Fees	Expenses	TOTAL
1	Project Kickoff	4	2		2			2	10	\$1,992	\$ -	\$1,992
2	Review of Information	8	4		8		6		26	\$5,074	\$ -	\$5,074
3	Site Visits	20	20				4		44	\$10,192	\$ 589	\$10,781
4	Conceptual Channel Design Support	8			8		4		20	\$4,031	\$ -	\$4,031
5	Sediment Transport Estimates	32	4	8	64	8	12		128	\$24,715	\$ -	\$24,715
6	Refined Channel Design Support	16	2		10		2		30	\$6,646	\$ -	\$6,646
7	Preliminary Design Report	12	2		16		6		44	\$8,120	\$ -	\$8,120
8	Client Meeting	10			2		2		14	\$3,261	\$ 215	\$3,476
<b>TOTAL</b>		<b>110</b>	<b>34</b>	<b>8</b>	<b>110</b>	<b>8</b>	<b>38</b>	<b>8</b>	<b>316</b>	<b>\$64,031</b>	<b>\$804</b>	<b>\$64,835</b>



## ACTION ITEM MEMORANDUM

**Date:** May 31, 2024  
**To:** Cherry Creek Basin Water Quality Authority TAC  
Jane Clary, CCBWQA Technical Manager  
**From:** Erin Stewart, LRE Water  
**Subject:** 2024 Wetland Harvesting Project Recommendation

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### Request

TAC recommends that the Board accept the 2023 Wetland/Cattail Harvesting Pilot Project Update and select one of the actions outlined below regarding the authorization of continuing the Wetland Harvesting Pilot Project in 2024, at an expenditure of not to exceed \$90,000, with the direct selection of L&M Enterprises to perform the harvesting.

### Wetland Harvesting Project Background and Summary

The Cherry Creek Basin Water Quality Authority (CCBWQA) works to accomplish its mission and vision of improving water quality and protecting the beneficial uses in Cherry Creek Reservoir through Pollution Abatement Projects (PAPs). In 2021, a pilot project for Wetland/Cattail Harvesting was authorized (R2R Engineers, CHPPM memo [Appendix A](#)) to evaluate the effectiveness of removing plant biomass to reduce nutrient loads reaching Cherry Creek Reservoir.

The project objective was to harvest wetland plants near the end of their growth season when nutrient concentrations are high. This action removes the biomass containing the nutrients that would otherwise decompose, releasing nutrients into the water which flows directly into the Reservoir.

The pilot project includes annual updates, intermediate milestones (about 2-year intervals), and a final report after 6 years to review effectiveness/costs/efficacy, optimization (i.e., maximizing nutrient removal while efficiently using resources allocated for harvesting), and if needed, changes, reductions, or elimination of the pilot project.

Multiple factors may affect the fraction of this nutrient load that would have reached the Reservoir in the absence of wetland harvesting. The CCBWQA has reviewed instream water quality monitoring data during the pilot project to evaluate if measurable changes were achieved as a result of the harvesting efforts. These results have been inconclusive so far due to the limited data set, already low phosphorus concentrations in Cottonwood Creek and other variables in the watershed.

A memo and presentation on 2023 Wetland Harvesting Project updates was provided at the May TAC meeting. A discussion followed regarding completing the full pilot study based on the funds allocated in the CIP budget, completing one additional year and reviewing the water quality analysis again, and



evaluating options for harvesting in different areas of the watershed. Efforts to review findings with Alpine Eco, SEMSWA’s consultant for prior wetland harvesting studies, is in progress but could not be completed before this meeting.

**Project Findings**

The CCBWQA Wetland Harvesting has been completed on Cottonwood Creek for the last 3 years as part of the 6-year pilot project.

**2023 Wetland Harvesting Summary**

- **Total material disposed: 329,400 lbs**
- **Total area harvested: 3.22 acres**
- **Total phosphorus removed: 240-298 lbs**
- **Total nitrogen removed: 1,767-2,327 lbs**

Table 1. Outlines the original pilot design estimates along with the actual costs for the last 3 years. The project cost has gone up, but the removal efforts have been more effective in terms of biomass removed. There has also been a significant reduction in the cost/lb of phosphorus removed from the estimated values.

**Table 1. Wetland Harvesting Project Progress Comparison**

Year	ESTIMATED					ACTUAL				
	Area (Acres)	N (#)	P (#)	Cost (\$)	Cost (\$) / P (#)	Area (Acres)	N (#)	P (#)	Cost (\$)	Cost (\$) / P (#)
2021	2.11	409	59	59,800	\$1,000	2.46	561	69	82,500	\$1,200
2022	2.15	417	60	59,900	\$1,000	3.79	1527	207	90,000	\$435
2023	2.11	409	59	59,800	\$1,000	<b>3.22</b>	<b>2,047</b>	<b>269</b>	<b>90,000</b>	<b>\$335</b>
2024	2.15	417	60	59,900	\$1,000					
2025	2.11	409	59	59,800	\$1,000					
2026	2.15	417	60	59,900	\$1,000					
<b>Total =</b>	<b>12.78</b>	<b>2477</b>	<b>356</b>	<b>359,100</b>	<b>\$1,000</b>	<b>6.25</b>	<b>4,135</b>	<b>545</b>	<b>262,000</b>	<b>\$481</b>



**Budget:**

CCBWQA's 2024 budget includes \$90,000 for the pilot project.

**Motion:**

I move that the TAC recommends that the Board accepts the 2023 Wetland Harvesting Project Update and:

1. authorizes the Wetland Harvesting Pilot Project to continue in 2024, an expenditure of not to exceed \$90,000, and the direct selection of L&M Enterprises to perform the harvesting.

or

2. discontinues the wetland harvesting project and evaluates options for using the funds for another project or harvesting in a different location of the watershed.



## ACTION ITEM MEMORANDUM

To: CCBWQA- TAC  
From: RG and Associates, LLC(RGA); Rick Gonçalves, Water/Wastewater Manager  
Date: May 24, 2024  
Subject: Site Location Application Review of Cherry Creek Middle School No. 8 Lift Station

**Request:** Consideration for Approval of Cherry Creek Middle School No.8 Lift Station Site Location Application.

### Informational Data:

- Submittal Review: Performed by Rick Gonçalves, CCBWQA Water/Wastewater Manager
- Location of Project: In Arapahoe County, 0.8 miles West of Gartrell Road/E-470 Intersection, 0.6 miles east of Piney Creek, 4 miles east of Cherry Creek
- Applicant: Prairie Point Community Authority Board
- Owner: Aurora Water
- Service Area:
  - Services 126 SFEs plus Liberty Middle School
- Application:
  - To replace existing Cherry Creek Middle School No. 8 with a new lift station with 152 gpm increased capacity pumps to service the larger service area
  - Reconstruct a portion of existing 8-inch force main to a 4-inch force main to increase scour velocities and reduce incidences of force main blockages
  - Provide 10,866 gallons of emergency overflow storage, including a new underground concrete overflow vault-18% more than default minimum
  - Add emergency power generation.
  - Add differential flow meters.
- CDPHE **Regulation 22 Lift Station Site Location Application Form Section 22.9**
  - Correctly filled out
  - Requires approval or disapproval of CCBWQA as the 208 Management Agency
- CDPHE **Wastewater Receiving Entity Certification Section 22.9 – Lift Station** form
  - Correctly filled out
  - Identified and signed by Metro Water Recovery-Robert W. Hite Treatment Facility

### Basin Specific Criteria:

- Project adequately meets the specific criteria as outlined in CCBWQA Guidance Document
  - Differential flowmeters
  - Redundant pumps, control floats, and alarms
  - Emergency generator
  - Overflow storage
  - Clear maintenance plan
  - Well defined Emergency Response Plan
  - All of which are protective of the water quality in the watershed and the reservoir.

**Suggested Motion:**

- **Motion to accept the Cherry Creek Middle School No.8 Site Location Application and recommend to the board that it approve and sign said Site Location Application as the 208 Management Agency for the basin.**



## Memorandum

**Date:** May 19, 2024

**To:** Lisa Knerr, PE- CCBWQA Technical Advisory Chairman (TAC)

**CC:** Bill Ruzzo, John McCarty; Executive Committee Managers; Jane Clary-Technical Manager

**From:** Ricardo (Rick) Gonçalves, PE

**Subject:** Cherry Creek Middle School No. 8 Lift Station Replacement Site Location Approval Review

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### Introduction:

An Application for Site Location Approval to replace the existing Cherry Creek Middle School No. 8 Lift Station, to be renamed Kings Point Lift Station, was submitted on April 22, 2024 to the Cherry Creek Basin Water Quality Authority (CCBWQA) for review as a referral to Colorado Department of Health and Environment (CDPHE). The CCBWQA is the 208 Management Agency for the Cherry Creek Basin. Regulation 22 requires that 208 Management Agencies review, either approve or disapprove all Site Location Applications for Lift Stations and indicate that approval or disapproval on the site application form along with the authority manager's signature.

### Location:

The Cherry Creek Middle School No. 8/Kings Point Lift Station (CCMS8/KP) is located across the street from the Liberty Middle School in Arapahoe County. It was originally constructed to service the flows from the Liberty Middle School. The lift station is not located in or near a floodplain. Figure 1-1 shows the location of the lift station, which is 0.8 miles west of the intersection of Gartrell Road and E-470, 0.6 miles west of Piney Creek and 4 miles east of Cherry Creek.



**The Project:**

The existing CCMS8 lift station was constructed in 2001 to serve Liberty Middle School. Its peak capacity is 100 gpm, and it is owned and operated by Aurora Water. It pumps through parallel 4-inch and 8-inch force mains for 920 feet to the east to discharge into the Piney Creek Interceptor gravity system.

There is a 126-unit single family development proposed to the southwest of the CCMS8 lift station that cannot connect its sewage collection system to Aurora’s collection system by gravity, but it can deliver flows to CCMS8 which can then pump those flows into the Aurora collection system. As the existing lift station does not have enough capacity to pump these additional flows, an expansion of this lift station to increase its capacity would, therefore, be required. As other parts of the existing lift station besides the pumps are undersized as well, it has been decided that it would be most practical to construct a new replacement lift station to provide the expansion capacity. This new lift station, then, will be able to service the needs of the Liberty School and the expanded service area with a peak flow of 152 gpm, servicing the Liberty School and 126 single family homes. There will be dual pumps at the new lift station, each able to pump the peak flow of 152 gpm.



Both existing force mains will be used to convey the flows from the new lift station to the Piney Creek gravity system. The existing 8" force main will be reduced in size to a 4" equivalent to allow for adequate scour velocities that will reduce solids deposition. Dual flow meters will be installed, one at the lift station and one at the discharge point of the force mains to the gravity system.

For station failure emergencies, 10,866 gallons of emergency overflow storage will be provided- 3,966 gallons in the new wet-wells and existing manhole between the high-water alarm level and the overflow invert of the overflow tank, and 6,900 gallons in a new dedicated overflow tank. This amount of storage will provide 71 minutes of storage, 18% more than the minimum default requirement of 60 minutes, and 58% more than the 45 minutes of Aurora Water response time. In addition, a new, higher capacity emergency generator will be installed. Bypass pumping facilities will also be provided for the extreme case of both pumps failing or a force main rupture at the lift station. The wet-well levels will be monitored with redundancy, using both level transmitters and float-switches.

**Receiving Wastewater Facility:**

The Robert W. Hite Wastewater Treatment Facility of Metro Water Recovery is the wastewater treatment plant for the area which will ultimately treat the wastewater from CCMS8 lift station. As the development of this new area is significantly less than what was originally planned for in the development of the Piney Creek Lift Station, which the flows from CCMS8 lift station will discharge into, there will be no unaccounted and unplanned impact to the Metro Water Recovery Treatment Plant. To support this, Metro Water Recovery has reviewed the application and approved it in the Section 22.9 application form as the official wastewater receiving entity.

**Basin Specific Criteria:**

The project meets the CCBWQA specific criteria for lift stations as outlined in the basin authority's Guidance Document, including differential flowmeters, redundant pumps, overflow storage, a clear maintenance plan and well-defined Emergency Response Plan, all of which will be protective of the water quality in the watershed and the reservoir.

**Findings:**

We find, after thorough review of the Site Location Application for the upgrades to the CCMS8 Lift Station and its force main, that the application is complete, with the required Engineering Report, and CDPHE forms **Regulation 22 Site Location Application Form Section 22.9-Lift Station**, and CDPHE **Wastewater Receiving Entity Certification Section 22.9 – Lift Station** correctly completed, signed and ready for Authority approval.

**Recommendation:**

On the basis of the information that we have reviewed in the Site Location Application and its attendant Engineering Report for the Cherry Creek Middle School No. 8 Lift Station, we recommend that the TAC accept said Site Location Application and recommend to the board that it approve the Site Location Application, sign it, and forward it to CDPHE.





**Regulation 22 Site Location Application Form  
Section 22.9 - Lift Station**

A. Project and System Information							
System Name	Aurora Water						
Project Title	Cherry Creek Middle School No. 8 Lift Station Replacement						
County	Arapahoe						
Associated CDPS Permit No.	CO0026638 (Metro Water Recovery - Robert W. Hite Treatment Facility)						
Date Fee Paid or payment attached	xxxx	Invoice Number and Check Number	xxxxx				
Design Company Name	MSK Consulting, LLC						
Design Engineer	David Takeda, P.E.	CO License Number	34757				
Address	7157 S. Andes Circle						
	Centennial, CO 80016						
Email	dave@mskwater.com	Phone	303-903-0918				
Applicant/Entity	Prairie Point Community Authority Board c/o Clifton Larson Allen						
Representative Name	Lisa Johnson, Manager						
Address	8390 E. Crescent Pkwy, Suite 300						
	Greenwood Village, CO 80111						
Email	lisa.johnson@claconnect.com	Phone	303-779-5710				
B. Project Information							
<i>Location (existing or proposed site)</i>			<i>Proposed Project Capacity</i>				
Brief location description	-0.75 miles west of the E Dry Creek Rd and Gartrell Road intersection		Firm Pumping Capacity (capacity with the largest unit out of service)	175 GPM			
Legal Description (e.g., Township, Range)	Section 35, T5S, R65W of the 6th PM		Service Area Flow to Lift Station (maximum month average flow)	0.051 MGD			
County	Arapahoe						
Latitude	39.5800		Service Area Flow to Lift Station (peak hour flow)	0.220 MGD			
Longitude	-104.7389						
<b>Funding Process</b>	Will the State Revolving Fund (SRF) loan program be used to finance any portion of the project?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	If yes, please list project number	n/a
Project Schedule and Cost Estimate							
Estimated Bid Opening Date	March 2025						
Estimated Completion Date	November 2025						
Estimated Project Cost	\$3.0 million						

Project and System Information	
System Name	Aurora Water
Project Title	Cherry Creek Middle School No. 8 Lift Station Replacement
County	Arapahoe
Associated CDPS Permit No.	CO0026638
Treatment Entity Information	
1.	Name and address of the treatment plant providing treatment (Receiving treatment entity must fill out "Receiving Wastewater Entity Certification")
	Robert W. Hite Treatment Facility (Metro Water Recovery), 6450 York Street, Denver, CO 80229
Site Information	
2.	<p><b>Vicinity maps of site location which includes the following:</b></p> <p>a) 5-mile radius map: all treatment plants, lift stations and domestic water supply intakes</p> <p>b) 1-mile radius map: habitable buildings (e.g., residences, schools, and commercial structures), location of public and private potable water wells, an approximate indication of the topography of the area, and neighboring land uses.</p> <p>a) See attached Figure D-1 in the appendix of the Preliminary Engineering Report</p> <p>b) See attached Figure D-2 in the appendix of the Preliminary Engineering Report</p>
3.	<p><b>Site Location Zoning</b></p> <p>a) Present zoning of the site location?</p> <p>PUD</p> <p>b) Zoning within a one (1) mile radius of the site location?</p> <p>PUD, Ag</p>
4.	<p><b>Flood Plain and Natural Hazards</b></p> <p>a) Is the site located in a 100-year flood plain or other natural hazard area? If so, what precautions are being taken?</p> <p>No</p> <p>b) Has the flood plain been designated by the Colorado Water Conservation Board, Department of Natural Resources or other agency? If so, please list agency name and the designation.</p> <p>Yes, FEMA FIRM Map 08005C0503L (outside 100-year floodplain)</p>
5.	<p><b>Legal Arrangements Demonstrating Control of the Site</b></p> <p>Please provide the legal arrangements showing control of the site or right-of-way for the project life or showing the ability of the entity to acquire the site or right-of-way and use it for the project life.</p> <p>Lift station site is currently owned by the City of Aurora.</p>
Lift Station Information	
6.	<p>Please describe the period during which service area build-out will occur.</p> <p>Buildout of the service area is estimated to take 5 years after the facility is in service.</p>
7.	<p>Please describe the flows/loadings expected in the first five years operation. Also provide the flow/loading projections showing projected flow and loading over the following 20 years.</p> <p>Flows will steadily increase over the 5 year buildout period. The proposed lift station's service area cannot be expanded, thus it will be constant over the following 20 years.</p>
8.	<p>Will the proposed lift station replace an existing lift station?</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>If Yes, please describe the current flows and loadings that will be switched to the proposed lift station.</p> <p>Approximately 85 gpm of peak flow will be switched to the proposed replacement lift station.</p>

9.	<p>Describe emergency back-up system in case of lift station and/or power failure to minimize the possibility of sanitary sewer overflows and health hazards to the public and operations personnel.</p> <p>The lift station will have duplex pumps, a bypass connection for a portable emergency pump, emergency overflow storage, and a standby generator.</p>
<b>Project Information</b>	
10.	<p>What entity is financially responsible for the construction of the treatment works?</p> <p>Prairie Point Community Authority Board (applicant)</p>
11.	<p>What entity has the financial responsibility for owning and long term operating expense of the proposed treatment works?</p> <p>Aurora Water</p>
12.	<p>What entity has the responsibility for managing and operating the proposed treatment works after construction?</p> <p>Aurora Water</p>
<b>Additional Factors</b>	
13.	<p>Please identify any additional factors that might help the Division make an informed decision on your site location application.</p> <p>The existing CCMS8 lift station is undersized for the new flows. Rather than expanding the existing facility, Aurora Water prefers to replace it with a new facility on the same site. Following the completion of the replacement lift station, the existing facility will be de-commissioned and removed. None of the existing components will be reused on the replacement lift station.</p>



**Applicant Certification and Review Agencies Recommendation  
Section 22.9 - Lift Station**

Project and System Information	
System Name	Aurora Water
Project Title	Cherry Creek Middle School No. 8 Lift Station Replacement
County	Arapahoe
Associated CDPS Permit No.	CO0026638

**1. Applicant Certification**

I certify that I am familiar with the requirements of *Regulation 22 - Site Location and Design Regulations for Domestic Wastewater Treatment Works*, and have posted the site location in accordance with the regulations. An engineering report, as described and required by the regulations, has been prepared and is enclosed.

Applicant Legal Representative			
Position/Title Manager	Typed Name Lisa Johnson	Signature 	Date 5/30/2024
Email lisa.johnson@claconnect.com	Phone 303-779-5710		

The system legal representative is the legally responsible agent and decision-making authority (e.g. mayor, president of a board, public works director, owner). The Design Engineer is not the legal representative and cannot sign this form.

**2. Recommendation of Review Agencies**

As required in Sections 22.9(1)(c) and 22.9(1)(d), the application and the engineering report must be submitted to all appropriate local governments, local health authority, 208 designated planning and management agencies and other state or federal agencies for review and comment prior to submittal to the Division. By signing below, the review agency: 1) acknowledges receipt of the proposed site location application, 2) has reviewed the proposed application and may elect to provide comments, and 3) has provided a recommendation concerning the application to the Division. The recommendation should be based on the consistency of the proposed site location application with the local comprehensive plan(s) as they relate to water quality and the approved regional water quality management plan(s). *Please note: Review agencies are encouraged to provide project comments; however, if a review agency does not recommend approval then the agency must attach a letter describing the reason for their decision or comment on the next page.*

Signature of designated Management Agency (i.e., Water Quality Authority, Watershed Association, Watershed Authority)				
Agency Cherry Creek Basin Water Quality Authority	Typed Name	Signature	Date	
Email	Phone	Recommend Approval?	Yes	<input type="checkbox"/>
			No	<input type="checkbox"/>

Signature of County, if the site is located in unincorporated areas of a county				
County n/a	Typed Name	Signature	Date	
Email	Phone	Recommend Approval?	Yes	<input type="checkbox"/>
			No	<input type="checkbox"/>

Signature of City or Town, if the site is located within a City/Town boundary or within three miles of the City/Town boundary (if multiple, attach additional sheets as needed)				
City/Town City of Aurora	Typed Name	Signature	Date	
Email	Phone	Recommend Approval?	Yes	<input type="checkbox"/>
			No	<input type="checkbox"/>

**Signature of Local Health Authority**

Agency Arapahoe County Public Health	Typed Name	Signature	Date	
Email		Phone	Recommend Approval?	Yes <input type="checkbox"/>
				No <input type="checkbox"/>

**Signature of 208 Designated Planning Agency**

Agency n/a	Typed Name	Signature	Date	
Email		Phone	Recommend Approval?	Yes <input type="checkbox"/>
				No <input type="checkbox"/>

**Signature of other State or Federal Agencies, if treatment works is located on or adjacent to a site that is owned or managed by a federal or state agency.**

Agency n/a	Typed Name	Signature	Date	
Email		Phone	Recommend Approval?	Yes <input type="checkbox"/>
				No <input type="checkbox"/>

**Signature of other undesignated Basin Water Quality Authority, Watershed Association, Watershed Authority, etc.**

Agency n/a	Typed Name	Signature	Date	
Email		Phone	Recommend Approval?	Yes <input type="checkbox"/>
				No <input type="checkbox"/>

**Review Agency Comments:**





**Wastewater Receiving Entity Certification  
Section 22.9 - Lift Station**

Project and System Information			
System Name	Aurora Water		
Project Title	Cherry Creek Middle School No. 8 Lift Station Expansion		
County	Arapahoe		
Receiving Treatment Entity Information - Certification of Available Treatment Capacity			
Receiving Treatment Entity	Metro Water Recovery	Receiving Treatment Plant	Robert W. Hite Treatment Facility
CDPS Permit No.	CO0026638	Permit Capacity	220.0 MGD
Site Location Approval No. (attach copy of approval)	4726	Site Location Approved Capacity	220.0 MGD
Proposed treatment works capacity impacts on receiving treatment plant (projected at buildout or 20-years)			
Proposed maximum month average hydraulic capacity:	0.051 MGD		
Proposed peak hour hydraulic capacity:	0.220 MGD		
Proposed maximum month average organic loading capacity:	n/a lbs BOD <sub>5</sub> /day		
Proposed treatment works will increase the receiving treatment plant's hydraulic loading to:	72 (% of total plant capacity)		
Proposed treatment works will increase the receiving treatment plant's organic loading to:	77 (% of total plant capacity)		
Treatment Certification - Section 22.9(1)(b)(v)(A)			
Yes, the treatment entity will provide treatment	<input type="checkbox"/>	No, the treatment entity will not provide treatment	<input type="checkbox"/>
Capacity Certification - Section 22.9(1)(b)(v)(B)			
I certify that the receiving treatment plant is not presently receiving wastes in excess of the design capacity as defined in the above listed site location approval and discharge permit and has the capacity to treat the projected discharge from the proposed treatment works (initial in box).			
OR			
I certify that the receiving treatment plant does not currently have the capacity to serve the proposed project flows but is under construction, or will be in a phased construction of new or expanded facilities, and will have the necessary capacity to treat the projected discharge from the proposed treatment works (initial in box).			
			Estimated date capacity will be available
Note: Projections of flow and loading to the treatment plant over the period during which build out of the service area will occur or twenty years, whichever is less, as well as current and future plant capacity information must be provided to demonstrate the plan for maintaining adequate capacity to treat. Any proposed treatment plant phased construction must be shown in the Water Quality Management Plan or by appropriate planning and engineering studies.			
Compliance Status Certification - Section 22.9(1)(b)(v)(C)			
I certify that the receiving treatment plant has not been in violation of any effluent limitations in its discharge permit for the last two years (initial in box).			
I certify that the receiving treatment plant is not operating under a Notice of Violation and/or Cease and Desist Order from the Division resulting from discharge permit violations (initial in box).			
Note: If there have been effluent violations or if the treatment plant is operating under a Notice of Violation and/or Cease and Desist Order from the Division, please provide additional description of the situation and the treatment entity's proposed corrective measures to achieve consistent compliance. The Division will evaluate information provided and determine if approval should be granted, granted with conditions, or denied.			
Signature of Treatment Entity Representative certifying that the information presented above is accurate and complete.			
Position/Title	Typed Name	Signature	Date
Chief Executive Officer	William J. "Mickey" Conway		
Email	Phone		
mconway@metrowaterrecovery.com	303-286-3000		



CHERRY CREEK STEWARDSHIP PARTNERS, SPLASH  
AND SEMSWA PRESENT

# CHERRY CREEK RACE FOR THE WATERSHED

5K WALK AND FUN RUN



FUN RUN  
**5K**

Registration Fee : \$30

PRIZES FOR TOP  
1-3 MALE AND  
FEMALE FINISHERS

Food and Drinks Provided



08:00AM – 11:00PM  
Saturday July 13th, 2024

7711 S Parker Rd,  
Centennial, CO 80016



SAVE THE DATE AND SIGN UP TO RECEIVE  
REGISTRATION INFORMATION!

send email to:

[jlinden@semswa.org](mailto:jlinden@semswa.org)

336-404-2716





**CHERRY CREEK STEWARDSHIP PARTNERS, SPLASH  
AND SEMSWA PRESENT**

# **CHERRY CREEK RACE FOR THE WATERSHED**

**5K WALK AND FUN RUN**



## **RACE COURSE AND OVERALL EVENT MAP**

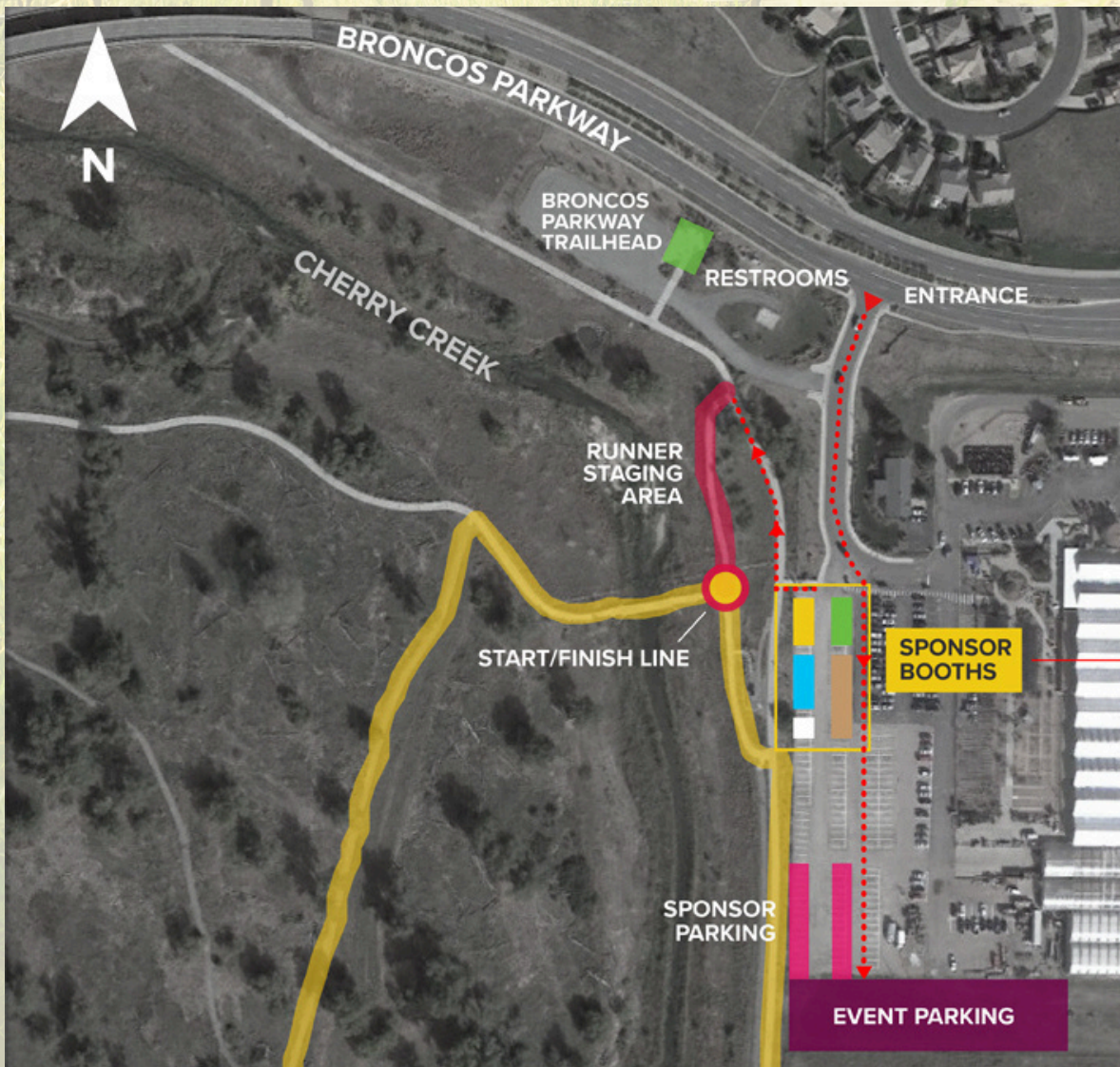




**CHERRY CREEK STEWARDSHIP PARTNERS, SPLASH  
AND SEMSWA PRESENT**

# **CHERRY CREEK RACE FOR THE WATERSHED**

**5K WALK AND FUN RUN**



## **DETAILED EVENT MAP**



## SAVE THE DATE

### Colorado Section SRM Summer Field Day

July 18-19, 2024 - Douglas County Open Space - Prairie Canyon Ranch

**CSSRM Board of Directors Meeting: July 18, 3:00 – 5:00 PM – Everyone welcome at Prairie Canyon Ranch meeting room, 4620 South State Highway 83, Franktown, CO**

**Field Day: July 19, 8:30 AM - 4:00 PM - Gather at Prairie Canyon Ranch meeting room  
Registration and continental breakfast open at 8:30 AM, field day starts at 9:30 AM**

#### **Regenerative Grazing Applied in a Holistic Framework**

This field day will take place on the Prairie Canyon Ranch located 5 miles south of Franktown. Douglas County manages the property as a working cattle ranch. Jamie Hull has managed the grazing on the ranch for the past few years. The session will inform & educate participants about managing foothill grasslands through good land stewardship practices and holistic grazing management, while considering livestock-wildlife interactions and working toward common goals of all partners.

The **Colorado Section of the Society for Range Management** is pleased to sponsor an exciting training opportunity tying forage, livestock, and open space aspects of ranching operations together.



This ranch has a unique story to share. The property was homesteaded by Frederick Bartruff and his family in 1873 and has been used as a working cattle ranch since that time. The collection of buildings illustrates significant advances in agricultural and architectural technology from the 1870s to the 1930s. The land is also rich in archaeological resources, with evidence of human occupation up to 9,000 years ago.

The property consists of several historic structures including a house, barn, saloon, blacksmith shop, cemetery, and stone cave and corrals (circa 1875-1938). The ranch is characterized by rolling grasslands, mixed pine and Gambel oak forests, rocky outcrops, sandstone canyons, Cherry Creek riparian areas. The ranch was acquired because of its diverse wildlife habitat for hawks, pronghorn, coyotes, deer, elk, and great blue herons.

**Register at <https://www.eventbrite.com/e/colorado-section-srm-summer-field-day-tickets-887636664157?aff=oddtcreator>**



Registration includes all informational materials, light breakfast, and lunch on July 19

Free tent camping-grounds will be available on the ranch at the pond site. (Bring your own camping equipment and food for supper)

**For information or questions contact:**

**Dan Nosal, [daniel.nosal@usda.gov](mailto:daniel.nosal@usda.gov), 303-218-2632 OR  
Ben Berlinger [ben.berlinger@usda.gov](mailto:ben.berlinger@usda.gov), 719-980-0518**

**Members, Non-members, Ag Producers and Small Acreage Owners are Welcome!**

**CHERRY CREEK BASIN WATER QUALITY AUTHORITY**  
**2024 Capital Project Status Report**  
Updated May 31, 2024

**RESERVOIR PROJECTS**

**1. East Shade Shelters Phase III and Tower Loop Phase II Shoreline Stabilization (CCB-17.5.1 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 1<sup>st</sup> 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 was made with RESPEC on 8/1/23 and the erosion areas at East Shade Shelters were measured. It has been estimated that roughly 14 cubic yards of soil was eroded from the 2023 storms (9/15/23). A progress meeting was held on 9/15/23, RESPEC will refine the breakout of components between recreational (CPW responsibility), water quality (CCBWQA responsibility), and shared (both CPW and CCBWQA responsibilities) costs and work on 408 review submittal to US Army Corps of Engineers. RESPEC was provided by the US Army Corps of Engineers' guidance on cut and fill and asked to prioritize the 408 application and review; they are coordinating with Gene Seagle in preparation for this submittal. RESPEC has provided a draft plan of action for the 408 permit submittal to be discussed with Gene (1/15). A meeting was held with Gene on (01/25/2024) to discuss the 408 requirements, subsequently RESPEC followed up with a submittal package PDF of the summary of impact for the project via email to Gene and Joe with USACE on (02/02/2024). Per email from Joe at USACE the proposed bank stabilization proposal is approved under routine operations and maintenance for 408 permitting. The project team is moving forward with preparation of 90% Design completion by end of April. Per discussion with CPW (Michelle), there will be shared funding available in July 2024 for the project. RESPEC submitted 90% Design on (05/03/2024). *A 90% plan review meeting was*

held by the team (5/20/2024) and Pre-Construction Notification for the Nationwide 13 404 permit was submitted by the project team on (5/29/2024).

### **Tower Loop Phase II –**

2. Final design and construction are currently scheduled for 2032 and 2033.

## **STREAM RECLAMATION PROJECTS**

### **1. Cherry Creek Stream Reclamation at Arapahoe Rd. - Valley Country Club to Soccer Fields, Reaches 3 to 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). MHFD is starting consultant selection process (10/13/23). Jacobs, Olsson, and Muller were shortlisted for interviews which are scheduled for mid-December (11/10/23). Muller was selected as the consultant (12/28/23). A scoping meeting for the project was held on (01/30/2024), a design scope is anticipated in the next month. Muller provided a scope and fee, a meeting with the project stakeholders is scheduled for April 3<sup>rd</sup> to discuss. Muller provided a scope and fee for the work and the project stakeholders collaborated to refine the scope (04/03/2024). *CCBWQA's participation was lowered accordingly to meet 25% partner project level; IGA draft Amendment received TAC recommendation and is being taken to Board for their consideration in May (05/10/2024)*

### **2. Cherry Creek - Reservoir to Lake View Drive Alternatives Analysis and Development of Preferred Alternative (CCB-5.16A)**

- 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). The TAC created a subcommittee for this project on 8/3/23; which will attend progress meetings, provide timely feedback to Muller, and to coordinate with TAC as needed. The alternatives analysis kickoff meeting was held on 8/29/23. A site visit was held on 9/22/23 to look at multiple flow paths and potential risks for consideration in alternatives analysis. It was verbally reported at the 11/16/23 Board meeting that Colorado Parks and Wildlife's repair of Lake View Drive is underway which includes the alternatives of concrete pipe and trash racks, cleaning out of culverts 1-9 and the beaver debris, and it is scheduled for completion by mid-December. Muller was provided US Army Corps of Engineers' guidance on cut and fill for consideration in their alternatives analysis (12/1/23). Muller is working through the Alternative Analysis and is coordinating a meeting (02/02/2024) to discuss alternatives in late February with the team. Muller presented a design alternatives overview in a meeting held on (02/28/2024) and is working to compile the alternatives analysis with costs to present at the April TAC meeting. Muller presented their alternatives analysis at the April TAC meeting (04/04/2024). Muller provided the Alternatives Analysis Report for Cherry Creek Reach 1 and is included in the May Board Packet (05/10/2024). *Acceptance of the Alternatives Analysis Report by Muller will be taken to the June TAC/Board. The scope and fee for Muller to proceed to a preliminary design in 2024 will be taken to the June TAC/Board for approval. Muller will attend the June TAC/Board to answer questions regarding the alternatives analysis.*

### **3. 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 16<sup>th</sup> 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. Muller submitted their 90% design submission on 9/14/23; the engineer's estimate confirms that additional funding is needed for construction. IGA Amendment for additional funding is scheduled for TAC and Board consideration at October meetings and 90% review meeting was held on 10/13/23. Comments were provided for 90% submittal and discussed at the review meeting (11/10/23). The project Schedule has been updated to have Naranja start construction in September 2024.

### **4. 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 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). The sanitary sewer relocation has been contracted for with Concrete Express Inc. or CEI (8/11/23). Construction of stream reclamation will start once Individual Permit Authorization has been received (11/10/23). CEI has sent final contract pricing to MHFD via email (01/26/2024) updated from pricing in October 2023. The Individual Permit authorization under section 404 of the Clean Water Act for the project was received on (02/29/2024). The construction kickoff meeting was held on 03/18/2024. CEI mobilized onsite the week of 04/08/2024; the first onsite progress meeting was held on 04/11/2024.

**5. Piney Creek - Cherry Creek to Parker Road, Reaches 1 to 2 (SEMSWA) (CCB-6.5)**

- 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. SEMSWA has no comments on the IGA Amendment and plans to take it to their Board in October (8/11/23). The project site was walked with SEMSWA and Olsson and Associates on 8/30/23, Olsson is preparing their scope of work and fee for design. Comments on Olsson's scope of work and fee were provided to and coordinated with SEMSWA (11/10/23). Olsson's scope of work and fee have been finalized and SEMSWA is planning on contracting for the initial design phase in early 2024 (12/1/23). The design contract with Olsson was completed on (01/19/2024). A site visit is set with Nicole with SEMSWA for 02/12/2024 to observe and discuss the project. The project design kickoff meeting was held on (02/29/2024). IGA 2<sup>nd</sup> Amendment was authorized by the Board on (03/21/2024) for funding of \$39,000 for 2024. A coordination meeting was held on (04/04/2024) with the Muller team working on Cherry Creek (Reaches 1-3 in the park) to ensure the coordination for the Piney Creek /Cherry Creek confluence was occurring and teams were working together.

- 6. Piney Creek south of Orchard Rd., Reaches 4 to 5 (SEMSWA) (CCB-6.6)**
- a. Description: This project includes approximately 3,800 liner feet of stream reclamation on Piney Creek. The project partners are MHFD, SEMSWA and CCBWQA.
  - b. Status: A site visit is set with Nicole with SEMSWA for 02/12/2024 to observe and discuss the project. A meeting was held with SEMSWA and MHFD to discuss IGA and potential consultants for design (03/07/2024). The IGA draft received TAC recommendation and is being taken to Board for their consideration in May (05/10/2024). *The IGA draft was approved by the Board (05/16/2024) pending final review and approval by legal counsel.*
- 7. McMurdo Gulch Priority 3 Stream Reclamation (CCB-7.4)**
- 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. A meeting was held on 01/24/2024 to help determine the approach for obtaining 404 permitting (including Muller, ERO, Castle Rock and CCBWQA). Wetland mitigation under a nationwide permit was recommended by ERO and potential cost impacts for this approach were discussed. Muller's is working on updating estimated construction costs but anticipates being able to move forward with one complete project instead of phasing into two (separating the work on the upstream reach). Muller provided a breakdown of the estimated construction cost versus budget in a meeting with Castle Rock on (02/08/2024) showing the potential to construct both projects in one phase.
- 8. Lone Tree Creek in CCSP downstream of Pond (CCBWQA Only) (CCB-21.1)**
- a. Description:
  - b. Status: *This project is expected to begin in 2028*
- 9. Lone Tree Creek in Cherry Creek State Park (CCB-21.3)**
- 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. The project is included in CCBWQA's 2024 Budget and 10-year CIP (11/10/23). UASCE is currently reviewing this project as of a letter requesting comments dated (12/15/2023). 100% Construction Documents were submitted (02/20/2024). *Per*

*conversation with Centennial staff, the project has still not obtained a 408 permit through the USACE (5/22/2024)*

**10. Happy Canyon Creek at Jordan Road (SEMSWA) (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 phosphorus 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). A progress meeting was held on 10/30/23 where the groundwater information was reviewed and the impacts from the 2023 storms were discussed; MHFD is planning additional sediment removals accordingly. A project site walk with the project team is scheduled for 1/31/2024. A site walk was held on 01/31/2024 with SEMSWA, MHFD and the design team to discuss the study and observe the changes in the project since the 2023 storms. MHFD has performed sediment removals, and that quantity information was shared with the project team. (01/31/2024). A design progress meeting was held on (02/26/2024) to discuss the direction moving forward in the alternatives analysis from the assessment phase of the project. The IGA 3<sup>rd</sup> Amendment for additional \$50,000 funding is scheduled for the April 2024 TAC/Board. The IGA 3<sup>rd</sup> Amendment was approved for an additional \$50,000 funding at the April Board Meeting (04/18/2024). An agreement has been made with Jacobs to begin drone survey of the project area (04/22/2024). *Jacobs has completed the Drone survey, and a progress meeting is set for (07/01/2024) for the next design progress meeting.*

**11. 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 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 the Board in September (9/9/21). 2021 IGA Amendment has been executed (11/11/21). Coordination with CDOT and Amendment at their June 16<sup>th</sup> 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 the upstream third (7/27/23). The construction is nearly complete with the punch list walk on 9/13/23; contractor is working on completing plantings and resolving punch list items. Asphalt repairs on the frontage road are being scheduled and some of the plantings will need to be done during the 2024 spring planting window to improve their chance for success (11/10/23). Asphalt repairs have been made and the project summary has been prepared (12/1/23). Post construction LOMR services agreement amendment for Muller draft has been prepared by MHFD and sent to CCBWQA for review (03/06/2024). Post construction services for wetland monitoring, permitting closeout and revegetation has been submitted by ERO resources, an agreement has been sent to project partners by MHFD and reviewed.

## **12. 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 the 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 of Phase 1 is complete (7/27/23). Project summary has been prepared (12/1/23). A warranty walk for Phase 1 improvements was held on (04/09/2024) with CEI, SEMSWA, RESPEC and Corvus.

**13. Dove Creek - Chambers Rd. to Pond D-1 (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. Construction was broken into 2 phases with Phase 2 scheduled for 2024.
- b. Status: CCBWQA acted at their October meeting to advance their funding for Phase 2 Construction to 2023 with SEMSWA's funding scheduled for 2024, IGA has been prepared and scheduled for signatures after SEMSWA's November Board meeting, phosphorus estimates for sediment capture areas for the project were provided to Technical Manager (11/10/23). A progress meeting was held on 01/23/2024 and construction is expected to start on 02/05/2024 completing 07/2024. GESC and State Stormwater Permitting was obtained week of the 02/05/2024 allowing the work to commence. Potholing for the project has been completed and results of waterline depths in the project area, appear to reduce encasements required throughout the project reach as reported in the progress meeting (02/06/2024). Water diversion is in place as of (02/20/2024). Forebay Slabs at Digicomm and Fairplay forebays have been poured as of (03/12/2024). Channel riffle – pool features have been completed in the channel as off week ending 03/22/2024. Western States mobilized to the site the week of 04/08/2024 to begin revegetation of the channel starting upstream. The Punchlist walk for the project is scheduled for (05/14/2024). *A punch list walk was held on 05/14/2024 and CEI has demobilized from the site. A final walk of the project and lessons learned discussion was held on 05/29/2024)*

**14. Mountain and Lake Loop Shoreline Stabilization Phase II (OM-)**

- a. Description: This project was identified 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). *Comments were received from the US Army Corps of Engineers on 8/29/23.* A meeting has been scheduled for 11/16/23 with USACOE's local staff and CPW staff to discuss the cut and fill balance requirements on this project and other planned projects in Cherry Creek State Park (11/10/23). A site meeting with CPW is being scheduled to determine the feasibility of the project after the 2023 storm damage (12/1/23). The 12/20/23 site meeting with Michelle Seubert identified 2 possible alternatives to address 2023 storm damage and meet USACOE cut and fill requirements while maintaining access to the swim beach. An updated project cost is about \$90,000 which is over the \$65,000 budgeted in 2024 (12/28/23). After discussion with Gene at USACE, further analysis to determine project feasibility is necessary and will be provided. Soil samples have been collected at the project site (03/7/2024) for further analysis of the project benefits.