

MEMORANDUM

JRS ENGINEERING CONSULTANT, LLC

TO: Chuck Reid, Manager - CCBWQA
CC: Rick Goncalves, PE, TAC Chairman
FROM: James R. "Jim" Swanson, PE
DATE: October 21, 2014
SUBJECT: Cherry Creek Stream Reclamation @ 12-Mile Park Phase II - Project Summary

Cherry Creek State Park - Cherry Creek Stream Reclamation @ 12-Mile Park Phase II Cherry Creek Basin Water Quality Authority

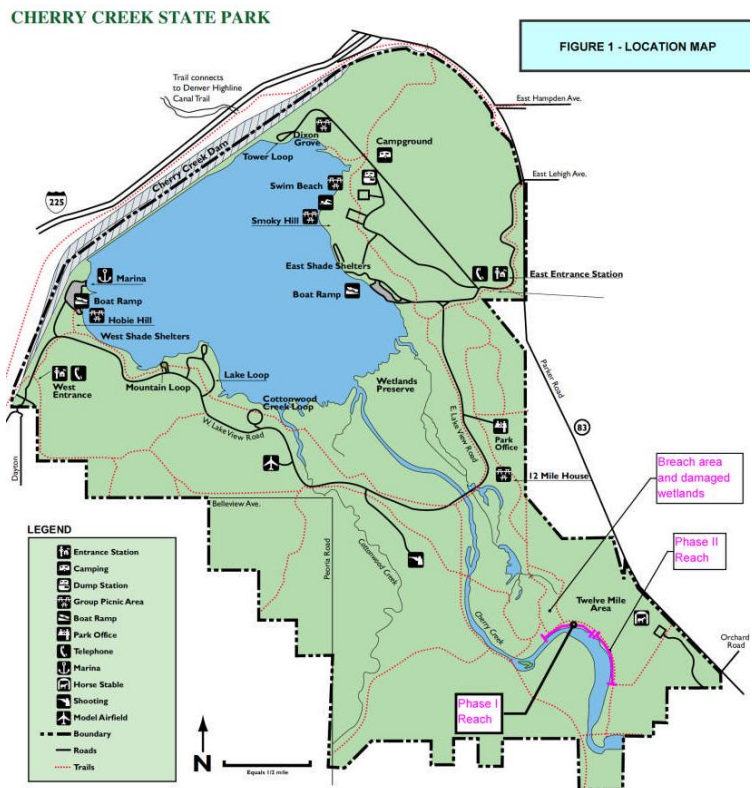
Presented in this memorandum is a summary of the second and final phase of the Cherry Creek Stream Reclamation at 12-Mile Park (Project). The first phase of the project, was substantially completed on June 6, 2012. The Cherry Creek Stream Reclamation @ 12-Mile Park Phase I - Project Summary Memorandum¹ highlights the initial project observations, details, investigations and findings.

BACKGROUND AND PURPOSE:

In 2007, Cherry Creek State Park (Parks) and the Authority inspected the reach of Cherry Creek along the "big-bend" in the Creek adjacent to the dog off-leash area near the south east area of the Park. This area is shown on Figure 1 - Location Map.

Severe damage to bank vegetation and channel erosion were observed throughout the area where people, dog, and horse activity were concentrated. The Authority evaluated the water quality impacts from these activities and decided to investigate the technical feasibility of stabilizing the channel banks.

The parties agreed to a design approach that would integrate stream stabilization measures with DOLA users by controlling access to the creek and creating a larger vegetated buffer between the creek and the fenced-in DOLA for water quality purposes, but also to continue to allow dogs and people to access the creek for recreation purposes in the same areas as existed at that time.



The Authority contracted with CH2M Hill to perform the design and construction phase services for the Phase II project through an amendment to the Cherry Creek Stream Reclamation Phase I project

¹ William P. Ruzzo, PE, LLC January 28, 2013, *Cherry Creek Stream Reclamation @ 12-Mile Park Phase I - Project Summary Memorandum*.

contract. This continuity provided a seamless transition in project design as well as continuity to integrate the Phase II project character and detail into those of the Phase I project.

EXISTING CONDITIONS:

The Phase II project limits were comprised of two distinct reaches. The upstream reach is characterized by a secondary channel to Cherry Creek, fed by groundwater. The downstream reach is an active channel bank to Cherry Creek.

The Authority's investigation during Phase I found that areas along the east bank of Cherry Creek were severely eroded with minimal existing vegetation and included topography typified by steep, almost vertical, slopes, see Photo 1. Other areas along the Project were not as steep; however, the bank was experiencing severe erosion from park user access, see Photo 2.



Photo 1 - Steep Creek Banks



Photo 2 - Limited Secondary Channel Access

Each reach was heavily used by both visitors and their dogs with challenges encountered to safely access the water's edge.

Large existing trees were characteristic to the shoreline and a valued component of the DOLA as seen in Photo 3. The Phase II project incorporated bank stabilization features that preserved existing trees and vegetation along the corridor.



Photo 3 - Existing Trees

DESIGN APPROACH:

Consistent with the Phase I project, the overall design approach for the Phase II Project is best described as “stabilization” rather than “reclamation”. No improvements are required along the left bank (looking downstream), which is a heavily vegetated, stable, wetlands and uplands area.

Since the right bank is so high (up to 14-feet), reconnection of the channel and the floodplain is impractical along the right bank. However, because of the intensive use of the right bank of Cherry Creek by the DOLA users, stabilization measures were limited to “harder” structures such as rock toe and timber access points. Photos 4 through 10 depict the completed improvements.



Photo 5 - Top of Bank Pedestrian Trail & Fence



Photo 4 - Connection with the Phase I Project

The newly constructed sloped banks are protected by a layer of void-filled rip-rap covered by topsoil and seeded vegetation. Fencing was installed along the top of bank as part of the DOLA project to control access to Cherry Creek.

Controlled access is provided by eight separate creek-access points along the creek bank constructed from boulders and timbers allowing DOLA users safe and convenient water access. Additionally, existing trees were protected and incorporated into the stream stabilization improvements.

Overall, nearly 6,000 cubic yards of earthen material was hauled off-site during the Project.



Photo 6 - Timber / Boulder Access Point

Photo 7 shows the constructed stream stabilization improvements along the bank at the existing tree shown previously in Photo 3. Tree preservation along the Project corridor provides instant shade and ambiance to the Project.



Photo 7 - Access Beach @ Existing Tree



Photo 8 - New Access to Beach @ Existing Tree



Photo 9 - Beach Access to the Secondary Channel



Photo 10 - Stabilized Slope (seeded & blanketed)

CONSTRUCTED PROJECT:

Bids for the project were opened on August 22, 2013. The successful bidder, 53 Corporation, was awarded the contract in the amount of \$873,992.00. The notice to proceed was issued for October 30, 2013. The work was substantially complete on June 2, 2014. The final project cost totaled \$876,694.20. 53 Corporation was also the contractor for the Phase I project, bringing additional continuity and experience to the Project.

PROJECT AWARD:

Following completion of project construction, the project was submitted to the Colorado Association of Stormwater and Floodplain Mangers as an entry for their annual awards program. Five projects were submitted for the awards program, three were presented and the Cherry Creek Stream Reclamation at 12-Mile Park project received the "Honor Award for Outstanding Achievement" following its presentation at the conference.

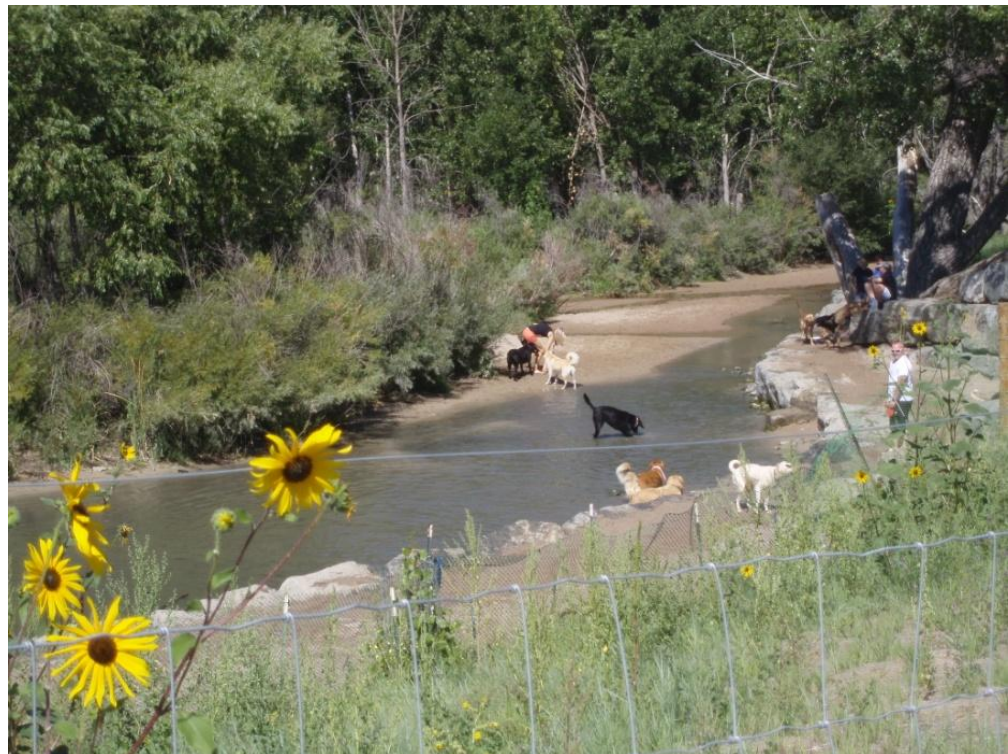


WATER QUALITY BENEFITS:

An assessment of the water quality benefits for the entire project was made by the Authority². Water quality benefits from the combined 12-Mile Park (Phases I and II) fall into one of two categories, stream stabilization or recreation management.

.As stated in the Cherry Creek Stream Reclamation @ 12-Mile Park Phase I - Project Summary Memo³: "*Stream stabilization benefits and evaluation procedures have been documented in the Authority's Stream Reclamation Interim Report⁴. Benefits include reductions in sediment and other pollutant loads and concentrations, including phosphorus and nitrogen. These benefits are supported by Authority data, literature research and quantitative analysis.*

The 12-Mile Park Stream Reclamation Plan also addresses the dispersed runoff from the DOLA by including a swale along the top of the east bank of Cherry Creek. This BMP is intended to capture minor storm events from the DOLA and provide filtration and infiltration treatment of the runoff."



² William P. Ruzzo, PE, LLC May 25, 2011. *Cherry Creek Stream Reclamation at 12-Mile Park - Water Quality Benefits and Costs.*

³ William P. Ruzzo, PE, LLC January 28, 2013. *Cherry Creek Stream Reclamation @ 12-Mile Park Phase I - Project Summary Memorandum.*

⁴ CCBWQA Technical Advisory Committee, June 16, 2011. *Stream Reclamation, Water Quality Benefit Evaluation - Interim Report.*