



COLORADO

Colorado Water Conservation Board

Department of Natural Resources

1313 Sherman Street, Room 718
Denver, CO 80203

Memorandum

To: Colorado Water Conservation Board Members

From: Kat Weismiller, Section Chief for Water Supply Planning
Sam Stein, Water Conservation and Drought Specialist

Subject: Agenda Item 12: Water Plan Action 1.9 - Storage Study Informational Update

Date: May 22, 2025 CWCB Board Meeting

This is an informational item with no Board action required.

Water Supply Planning staff and consultant team will jointly present an overview of Water Plan Agency Action 1.9: Water Storage Opportunities Study. This will include a summary of the scope of Action 1.9, the process for selecting a consultant to lead the work, the timeline for the study, and will conclude with a short discussion to gather Board input on three topics:

Discussion Topics for the Board

1. Do the case studies identified offer appropriate examples of the types of storage available across Colorado? Are there other case studies you might want to see included?
2. Are the factors used to define the development thresholds reasonable for defining our high, medium, and low scenarios? Are there other considerations we should include?
3. Are there any key challenges and opportunities related to storage that we might want to highlight?

Background

The Colorado Water Conservation Board (CWCB) released the 2023 Colorado Water Plan (Water Plan) and it included 50 agency actions that the CWCB committed to advancing. This included Action 1.9 “Develop a study for new and existing water storage opportunities”. The full action language can be found on page 183 of the Water Plan.

Water Plan Agency Action 1.9

Agency Action 1.9 highlights that storage is a critically important tool for meeting current and future water needs and providing flexibility to manage water supplies in the future under increasing climate and population stresses. Future storage projects will need to be increasingly collaborative and



multi-purpose to the extent possible. New storage projects will have to identify flexible solutions to expand existing facilities and minimize evaporation losses while also minimizing environmental impacts. Innovative strategies that explore how storage can be developed quickly, responsibly, and adaptively will also be needed. To that end, this report will provide an update to a [storage analysis Technical Memorandum](#) produced in the 2019 Analysis and Technical Update. The report will describe the various types of storage available in Colorado and provide case studies that demonstrate a variety of storage approaches from across the state, showcasing examples that exemplify key storage types as well as opportunities and challenges. These examples will include: Surface Water Storage, Groundwater Storage, Dam Rehabilitation, Storage Reallocation, Storage Expansion, Nature-Based Solutions, Sediment Removal, Seasonal MARR, and Aquifer Longevity MARR. A key part of this analysis will be to consider how to quickly adapt storage solutions to climate change needs. The 2019 Analysis and Technical Update explored the possibility of reallocating flood storage - this report will further explore the risk/benefit of that concept versus other potential adaptive management techniques.

Request for Proposals Process

The Colorado Water Conservation Board (CWCB) issued the Request for Proposals (RFP) for the Water Storage Opportunities Study on August 7, 2024. Following proposal evaluation, Jacobs Engineering Group Inc. was awarded the contract on October 16, 2024, and is currently under contract.

Study Overview

The Water Storage Opportunities Study aims to describe and quantify current storage, analyse the potential for additional storage, and evaluate storage barriers, future challenges, and opportunities across the State of Colorado. The Scope, timeline and deliverables are outlined below.

Tasks

Task 1: Description of Storage Types Within Colorado

- Task 1 will consist of a comprehensive list with descriptions of types of surface and groundwater storage currently being utilized in Colorado, as well as the related benefits and limitations of each type. This will include an explanation of ownership and the type of uses, as well as a rough estimate of the total volume of each type of storage in the state and locations in the state where surface water and/or groundwater are most prevalent. Characterization of non-traditional and innovative potential uses of water storage will also be captured.
- Characterize Surface Water and Groundwater Storage Potential
- **Deliverables:** Technical memorandum (TM) with tables and maps documenting current surface water, groundwater, and other storage strategies across Colorado, and narratives documenting key considerations for each type of storage.

Task 2: Analysis of Potential for Additional Storage in Colorado

- Task 2 will identify the potential for additional surface and groundwater storage and provide more detailed characterization of the different types of storage opportunities.
- This section will establish a low, medium, and high volumetric ranges of potential storage opportunities throughout the state based on considerations including conditional storage rights, permitting feasibility, hydrology, and the extent to which reservoir capacity that is now reserved for flood storage could or should be utilized for other storage uses.
- **Deliverables:** TM documenting the analysis and findings summarizing the potential for additional storage in Colorado under a range of practical development potential thresholds for both near-term and long-term.



Task 3: Evaluation of Storage Barriers, Future Challenges, and Opportunities

- Task 3 will document historical technical, environmental, political, and economic barriers to developing water storage in Colorado and strategies to overcome these challenges. These may include:
 - Balancing conservation opportunities and storage needs
 - Regulatory approvals and permitting challenges and opportunities to improve the process
 - Environmental impacts and opportunities to reduce impacts
 - Evaporative losses and climate change mitigation opportunities
 - Multi-benefit reservoir utilization (municipal, agricultural, environmental, recreational, flood control)
 - Reservoir enlargement versus new reservoir construction
 - Distributed storage
 - Groundwater migration risks and mitigation opportunities
 - Practical limitations on groundwater infiltration and withdrawal
 - Natural hazards impact on existing and future storage opportunities including drought, flood, and fire
 - Aging infrastructure
- This section will also include case studies and storage implementation visualization.
- Deliverables: TM documenting the evaluation of barriers and opportunities to developing water storage in Colorado, along with historical average timeframes and costs to implement different types of storage projects.

Task 4: Develop Recommendations

- Task 4 will be to develop recommendations that serve to identify strategies for how storage can be responsibly developed to improve water security throughout Colorado. This may include proposing best practices around the following themes:
 - Opportunities to reduce or defer the need for increased storage (e.g., conservation, revised operations, regional sharing of existing storage facilities)
 - Technical (e.g., siting closer to demand, less evaporation, ability to store/withdraw in a timely manner)
 - Environmental (e.g., allow ecosystem to naturally rebalance timing of flows, water banking to meet critical season instream flows)
 - Political (e.g., multi-benefit storage, early collaboration through 1041 process, funding sources)
- Deliverables: A final report delivered that includes sections dedicated to each of the project tasks as well as a project introduction, conclusions, and recommendations section.

Timeline

Jacobs started work in January of 2025 and have begun advancing some elements of the scope. The timeline of this project is as follows:

- **Task 1: Description of Storage Types** - February 2025 - April 2025
- **Task 2: Analysis of Potential for Additional Storage** - May 2025 - September 2025
- **Task 3: Evaluation of Storage Barriers, Future Challenges, and Opportunities** - October 2025 - December 2025
- **Task 4: Recommendations** - January 2026 - April 2026
- **Final Report** - June 2026



Case Studies

Task 3 of the water storage opportunities study, conducted by the consultant Jacobs, will feature regionally diverse case studies. These case studies will highlight the opportunities and challenges identified earlier in the study, reflecting on recent experiences of local governments and communities that have permitted or negotiated water storage projects. They will also detail the involvement of various State and Federal agencies and the timelines associated with project development. This also highlights the work of the CWCB Board and staff, as the Water Plan Grant program, Water Supply Reserve Fund Grant program, and/or the Loan Program have contributed funding to the majority of these projects. The identified case studies, along with several alternatives, are listed below.

- [Chimney Hollow Reservoir](#)
- [Whitewater/Mule Gravel Pits](#)
- [Chatfield Reservoir Reallocation](#)
- [Sheriff Reservoir Rehabilitation](#)
- [Deweese Reservoir](#)
- Strontia Springs Reservoir Sediment Mitigation and Removal*
- [West Side Intra-System Storage](#)
- Highlands Ranch Water*
- Rio Grande Water Conservancy District*
- South Platte Water Related Activities Program*

Alternates

- [Goose Pasture Tarn Rehabilitation](#)
- [Park Creek Reservoir Expansion](#)
- [Bolts Lake](#)

*These projects were not funded through the CWCB and thus do not have associated Board memos

Storage Development Thresholds

As part of Task 2: Analysis of Potential for Additional Storage in Colorado, a low, medium, and high volumetric range of potential storage opportunities will be developed based on considerations including conditional storage rights, permitting feasibility, hydrology, and the extent to which reservoir capacity that is now reserved for flood storage could or should be utilized for other storage uses.

The primary factors influencing storage development thresholds are the complexity of permitting and regulatory requirements, and the amount of available information related to a project. The thresholds, progressing from Low to High volume, encompass projects meeting the specific criteria of each level, in addition to those in previous thresholds. As the volume increases from Low to High, projects face greater permitting/regulatory complexity and have a lower level of definition.

Storage Development Threshold Criteria

Low Volume

- Projects at existing storage sites (reallocation, expansion, rehabilitation projects)

Medium Volume

- Resolution of all fill restrictions on existing sites
- Off-channel surface projects
- New groundwater storage projects



High Volume

- On-channel surface projects
- Other conditional surface storage rights
- Additional potential reallocation

Conclusion

Staff requests that the CWCB Board review the proposed case studies and development thresholds outlined above and provide any feedback, concerns, or additional considerations to help ensure the study is effectively designed to achieve the goals of Water Plan Action 1.9.

