



U.S. Army Corps of
Engineers, Omaha
District

Bear Creek Reservoir Lakewood, Colorado Reallocation Study

General Investigation Program

Feasibility Study
Project Management Plan



January 16, 2019

| | <u>DATE</u> | <u>DESCRIPTION & LOCATION WITHIN PMP OF REVISION</u> | <u>DATE APPROVED</u> | <u>APPROVED BY</u> |
|--------------|-------------|--|--------------------------|--------------------|
| Original PMP | | | | |
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1 Study Overview

The Bear Creek project is one of the three dam projects, known as the tri-lakes project, the U.S. Army Corps of Engineers (USACE) constructed in the Denver Metropolitan area. Bear Creek was the last of the three dams to be constructed, with construction being authorized in 1968 and the dam being completed in 1982. The main embankment of the dam is constructed of rolled earth fill and just over a mile long. The reservoir of the dam has a surface area of approximately 110 acres at the multipurpose pool elevation of 5,558 ft msl. The location of the Bear Creek Project in relation to the Denver Metro can be seen in Figure 1.

Figure 1. Project Location Map



The primary focus of this feasibility study effort will be on looking at the economic and technical feasibility of reallocating part of the reservoir storage pool to Municipal and Industrial (M&I) and other such purposes as requested by the local stakeholders. However, any change in pool storage will require analysis and evaluation, to ensure there is not an intolerable increase in risk associated with any proposed reallocation of storage.

Sponsor and Corps acceptance of the task descriptions, and time and cost estimates addressed in this PMP constitute agreement of the PMP overall, with the understanding that more detail will be provided for future tasks and milestones as the study progresses. Updates to this PMP will be prepared as needed to ensure the document accurately reflects the efforts of the study team. The information contained in this PMP will be used to update appropriate budgetary and other related documents for the feasibility study.

1.1 Study Authority

This feasibility study is being conducted under the authority of the Energy and Water Development Appropriations Bill of 1998 and the Flood Control Act 1950. These pieces of legislation authorize the USACE to study the potential for storage reallocation at Chatfield, Cherry Creek, and Bear Creek Reservoirs.

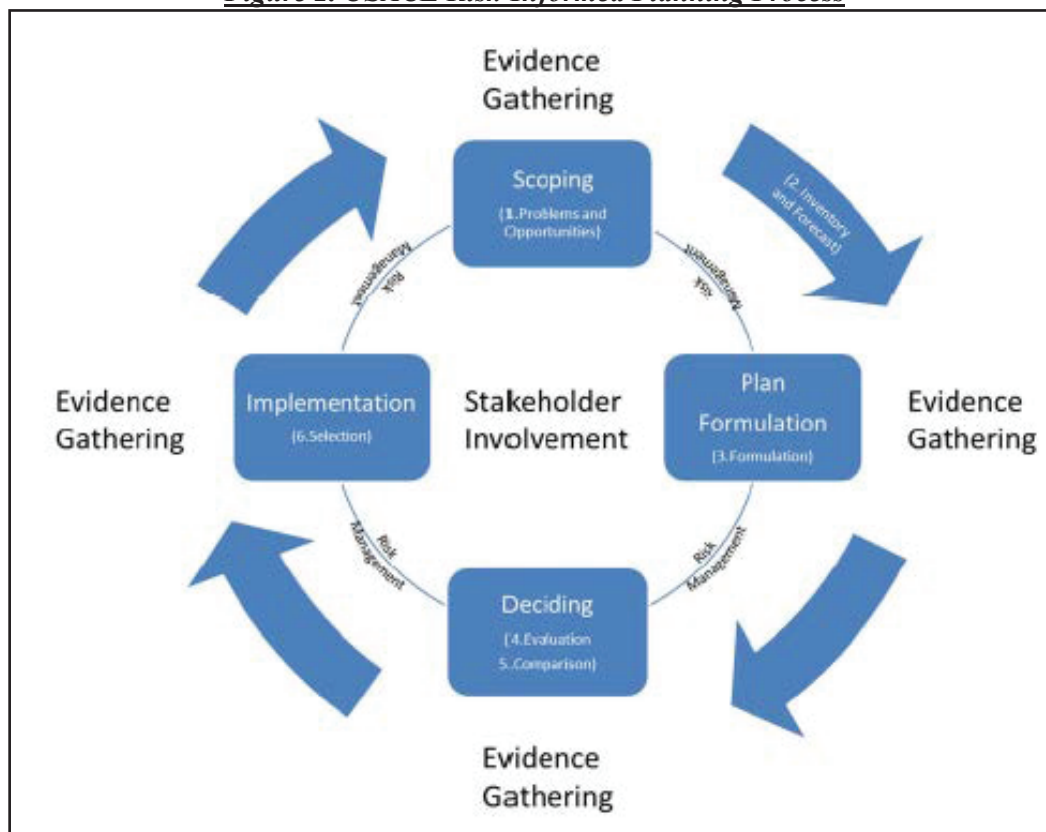
1.2 Sponsor and Agreement Information

On MarchXX 2019, the Omaha District Commander executed the Feasibility Cost Share Agreement between the State of Colorado, Department of Natural Resources and the US Army Corps of Engineers Omaha District. This agreement initiates the feasibility study of the Bear Creek Reservoir, Lakewood, CO Reallocation Study, being conducted under the General Investigations Program.

1.3 Study Definition

The proposed scope for the Feasibility Study is to determine the feasibility of reallocating a portion of the Bear Creek Reservoir pool to M&I and other similar purposes. All proposed plans will be evaluated for their economic viability, technical feasibility, and environmental and public acceptability. All considered plans will also be assessed for potential safety impacts on the Bear Creek Dam. The study team will follow the USACE Risk-Informed Planning Process (Figure 2) to identify, evaluate, compare, select, and if applicable implement the recommended plan for this study.

Figure 2. USACE Risk-Informed Planning Process



1.4 Project Objectives

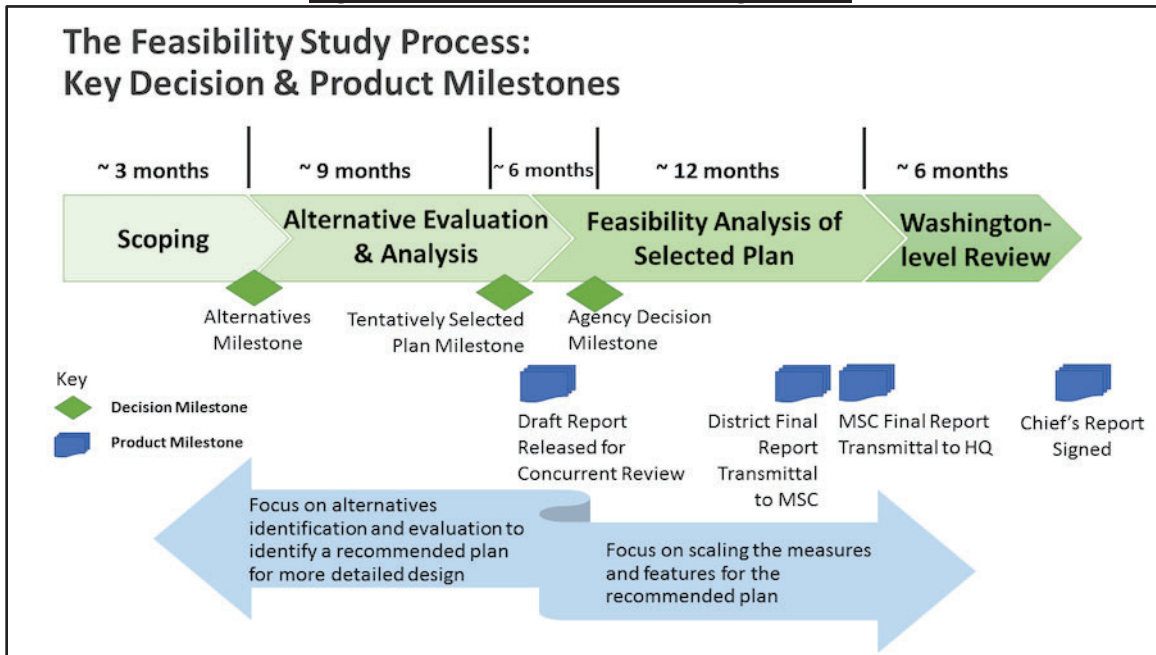
The objectives of this project will be determined by the study team once the FCSA has been signed and the team has conducted the first iterations of the planning process.

2 Project Scope

The general scope of this study includes all investigations and analysis required to prepare an integrated feasibility report and National Environmental Policy Act (NEPA) document. The recommendations of this document may lead to the development of a Water Supply Agreement that would reallocate a portion of the Bear Creek Reservoir Pool. This feasibility study may also require the development of a separate Dam Safety document that would have to be presented to the USACE Dam Safety Oversight Group (DSOG). Determination on the applicability of this dam safety document will be made by the team as the study progresses.

This feasibility study will be conducted in accordance with the USACE SMART (Specific, Measurable, Attainable, Risk-Informed, and Timely) Planning Process, which is shown in Figure 2. This feasibility study will also be required to comply with the 3x3x3 planning process, which directs the study team to accomplish the study within 3 years, for \$3 million or less, and with 3-levels of vertical team coordination and review. Beyond the 3x3x3 and SMART planning processes, this study may be subject to meeting certain requirements of the Risk-Informed Dam Safety Process, which will be determined in the future by the study team.

Figure 3. USACE SMART Planning Process



3 Project Schedule

The project schedule will be developed in conjunction with the detailed study scope of work during the first iterations of the planning process. However, Table 1 shows a high-level schedule with the major study milestones identified.

Table 1: Study Milestone Schedule

| Study Milestone | Date |
|---|----------------|
| Sign FCSA | March 2019 |
| Public Scoping Meetings | May 2019 |
| Alternatives Milestone Meeting (AMM) | June 2019 |
| Tentatively Select Plan (TSP) | March 2020 |
| Draft Report Released for Public Review | April 2020 |
| Public Review Meetings | May 2020 |
| Agency Decision Milestone (ADM) | September 2020 |
| Final Feasibility Report | September 2021 |
| Chief's Report Signed | March 2022 |

4 Project Cost

The preliminary estimate of the study costs are shown below. The majority of the planning and engineering work that is needed to complete the study involves formulating alternative plans, evaluating the effects of alternative plans, comparing alternative plans, and selecting the recommended plan for implementation. The Corps also has obligations to comply with environmental laws, regulations, and to conduct public involvement during its feasibility studies.

Please note that all developed cost estimates will assume labor performed at or slightly above current pay rates and only includes tasks known to be essential at this time. Some deviation may occur over the duration of the project’s development. Such deviations would need to be coordinated with the study partners. Table 2 shows the summary of costs.

Table 2: Preliminary Estimated Study Costs by Discipline

| Cost Item | Cost | |
|------------------------------------|--------------------|--|
| | USACE | Sponsor |
| Project Management | \$300,000 | No Work In-Kind Identified at this time. |
| Programs/Fund Management | \$50,000 | |
| Environmental Resources | \$200,000 | |
| Floodplain & Flood Risk Management | \$100,000 | |
| Hydrologic Engineering | \$400,000 | |
| Structural Engineering | \$100,000 | |
| Geotechnical Engineering | \$200,000 | |
| Hydraulic Engineering | \$200,000 | |
| Dam Safety Engineering | \$300,000 | |
| Water Control Engineering | \$150,000 | |
| Real Estate | \$150,000 | |
| Cost Engineering | \$75,000 | |
| Environmental Sciences | \$50,000 | |
| Economics | \$300,000 | |
| Public Outreach | \$50,000 | |
| Office of Counsel | \$50,000 | |
| Reviews | \$250,000 | |
| Travel | \$75,000 | |
| Independent External Peer Review** | \$100,000 | |
| Total Costs | | |
| Total Cost | \$3,100,000 | |
| Federal Cost Share | \$1,600,000 | |
| Non-Federal Cost Share | | \$1,500,000 |
| Work In-Kind | | \$0 |
| Cash Share | | \$1,500,000 |

**IEPR Costs are 100% Federal and not cost-shared.

5 PROJECT DELIVERY TEAM INFORMATION

Table 3: Bear Creek Reservoir, Lakewood, CO Reallocation Study Project Delivery Team

| Corps of Engineers PDT Members | | | |
|---|-----------------------------------|--------------|-----------------------------------|
| Name | Title | Phone | E-mail |
| Jeff Bohlken | Project Manager/Plan Formulator | 402-995-2671 | Jeffrey.C.Bohlken@usace.army.mil |
| Ron Beyer | Project Manager/Plan Formulator | 402-995-2748 | Ronald.S.Beyer@usace.army.mil |
| Dave Crane | Env. Resource Specialist | 402-995-2676 | David.J.Crane@usace.army.mil |
| Leslie Jaramillo | Program Analyst | 206-431-2793 | Leslie.D.Jaramillo@usace.army.mil |
| Other team members TBD once FCSA is signed. | | | |
| Non-Federal Sponsor Project Delivery Team Members | | | |
| Erik Skeie | CWCB Special Projects coordinator | 303-866-3441 | erik.skeie@state.co.us |
| Lauren Ris | CWCB Deputy Director | 303-866-3441 | lauren.ris@state.co.us |
| Other team members TBD once FCSA is signed. | | | |

6 FUNDING

In the feasibility phase, the cost share breakdown is 50% federal and 50% sponsor funding, excluding any costs associated with the Independent External Peer Review (IEPR) which are 100% federal. The projected funding schedule for the Feasibility Study shown in Table 4. It should be noted that federal fiscal years (FYs) run from 01 October to 30 September of the following year, i.e. FY19 is from 01 Oct 2018 to 30 Sep 2019.

Table 4: Projected Study Funding Schedule

| | Fiscal Year 2019 | Fiscal Year 2020 | Fiscal Year 2021 | Fiscal Year 2022 |
|--------------------|------------------|------------------|------------------|------------------|
| Federal | \$1,500,000* | \$0 | \$0 | \$100,000 |
| Non-Federal | \$300,000 | \$700,000 | \$500,000 | \$0 |

*Federal Share fully funded in FY19 with the exception of any IEPR costs.

If a feasible water reallocation plan is identified and approved, the design and implementation costs associated with the selected plan are 100% non-federal. Additionally, if implementation of dam safety mitigation actions is necessary, these actions will be cost-shared proportionally to any storage space reallocated by the selected plan.

7 RISK MANAGEMENT

Risk management seeks to reduce risk by identifying the risks and placing controls on it. In the context of the project goals, a number of procedures are in place through this PMP to assist in reducing the risk of unrealistic scope, cost estimates, schedule changes, and study resources. One such procedure was the development of a Risk Register, which will be used for capturing and tracking uncertainty throughout the project; the project risk register will be developed as Appendix C. These procedures will help to maintain schedule within cost limitations and under the project manager's span of control authority. Risks will be identified and documented by the study team throughout the life of the feasibility study.

8 ACQUISITION PLAN

The feasibility study scope does not include any contracted work at this time. If the study team determines that it is appropriate to contract out a portion of the feasibility study efforts, an acquisition strategy will be developed at that time. This plan will be developed in cooperation with Omaha District's Contracting Division using recommended tools and processes (PASB, CAM, etc.).

9 QUALITY CONTROL PLAN AND OBJECTIVES

This study will undergo a series of reviews at different times throughout the study life. These reviews include, but may not be limited to:

- **District Quality Control:** is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined by the study team. DQC is an integrated review approach that includes a Quality Management Plan providing for seamless review, Quality Checks (first line supervisory reviews, PDT reviews), a detailed peer review/checking of the documents, computations, and graphics, etc.
- **Agency Technical Review:** is undertaken to ensure the quality and credibility of the government's scientific information consistent with all applicable guidance. Each ATR will be conducted by a qualified team of senior highly experienced experts in the type of work being reviewed who are from outside of the home district and are not involved in day-to-day production of the project/product.
- **Public Review:** will be required for this study as the decision document will be an integrated feasibility study and NEPA document. This review solicits public input and feedback on any, and all, tentatively selected plans to ensure that the plan(s) is/are publically acceptable.
- **Policy Review:** is undertaken to ensure that all decision documents comply with applicable laws and policy. This review culminates in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority.
- **Independent External Peer Review:** is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted.

Further details of the quality control and review process for this feasibility study will be provided in a review plan, which is a separate document that will be created once the FCSA has been executed.

10 CHANGE MANAGEMENT PLAN

A procedure is necessary for defining how changes to project scope, schedule, and budget can be made for the project. Significant changes must have the approval of the project sponsor and the Corps. Changes or anticipated changes would be reported.

In practice, most changes will be made at the management level, acting in concert with recommendations from the PDT, including the local sponsor. If there are no significant changes in scope, costs, and schedule, the project manager can approve the change. A modification to the PMP would be needed if the change is considered significant, with notable impact to scope, schedule or budget.

If there are changes that would result in an increase in total project cost or a delay in completion of the overall effort, the Corps will follow a procedure known as the Project Schedule and Cost Change Report (SACCR). After concurrence from the Project Management Team, the Corps PM will prepare the SACCR in concert with a program analyst with the Planning, Programs and Project Management Division. This provides a justification for the changes. Action is taken on SACCRs at the Omaha District and Northwestern Division project review boards. To be approved by the Corps at the District and the Division level, a SACCR must first be approved and signed by the project sponsor if the project is in a cost-shared phase. At the local level, the request for change and costs would be reviewed by one of the sponsor's advisory committees. In absence of concurrence on change in scope and schedule, the full Council or even the Executive Committee may need to be involved.

Both the Corps and the sponsor at the Executive Committee level have veto power over any proposed scope and cost changes that are perceived to be or might become controversial. This provides both parties protection against commitments that would be unacceptable to either party. The intent is that issues would be resolved at the PDT as much as possible. There will be monthly opportunities for thorough communication about potential issues at the Corps in BCPERM and PRB meetings and at the sponsor level at regular agency meetings. Issues that cannot be resolved at the level of the PDT would be raised to the Executive Level. The Omaha District would assign the Deputy to the Omaha District Commander, as the Corps representative on the Executive Council. Any matter that could not be resolved at this level would first be raised to the NWD and possibly HQ level before any final decision would be made. During this time period, the sponsor would be welcome to participate in discussions and meetings to resolve any issues.

11 COMMUNICATION PLAN

11.1 Purpose

The purpose of the communication plan is to ensure the Project Management Plan provides relevant, accurate, and consistent project information to project sponsors, stakeholders and other appropriate audiences. By effectively communicating, the project can accomplish its work with the support and cooperation of each stakeholder group.

The communication plan provides a framework to manage and coordinate the wide variety of communications that take place during the project. The communication plan covers who will receive the communications, how the communications will be delivered, what information will be communicated, who communicates, and the frequency of the communications.

11.2 Objectives

Effective and open communications is critical to the success of the project.

The key communication objectives for the project are:

- Promote and gain support for the Project Management Plan
- Encourage use of project management best practices
- Give accurate and timely information about the project
- Ensure a consistent message

11.3 Target Audiences

This section identifies the audiences targeted in this Communication Plan, and the purpose of communicating with each audience.

Table 5: Communication Plan Target Audiences

| Audience | Communication Purpose |
|-------------------------------|--|
| Project Sponsor | Project plans, project progress, project issues, review of deliverables |
| Project Delivery Team | Project direction, project deliverables, clear direction and delegation of tasks |
| <i>Planning Branch Chiefs</i> | |
| Branch Chief | Project strategy, review of project deliverables, project progress, changes in work processes, change requests |
| Plan Formulation Chief | Project strategy, review of project deliverables, project progress, changes in work processes, change requests, project issues |
| Economics Chief | Changes in work processes, review of project deliverables |
| Environmental Chief | Review of project deliverables |
| Omaha District | Review of project deliverables, change requests |
| NW Division | Review of project deliverables, change requests |
| City and County of Denver | Review of project deliverables |
| District PAO | Review deliverables issued to the public |

11.4 Communication Message and Delivery

The following outlines the targeted audiences, the key communication messages to be delivered, and the method for delivering the information, the communicator, and the frequency of the delivery.

Table 6: Communication Messages and Delivery

| Audience | Message | Delivery Method | Delivery Frequency | Communicator |
|--|--|------------------------------|--------------------------------------|------------------------------|
| Project Sponsor | Project Plans, Status Report Project Deliverables, Project Briefings | E-mail Meetings | Weekly During milestones events | Project Manager |
| Project Delivery Team | Project schedule/progress, status reports | Meetings E-mail/Project file | Weekly/Biweekly | Project Manager |
| Planning Branch Chiefs | | | | |
| Branch Chief | Project Status (BCPERM) Review Deliverables | Meetings E-mail | Monthly Prior to completion | PM/Section Chief |
| Plan Formulator/PM Chief | Project Status Review Deliverables | Meetings E-mail | Monthly Prior to completion | Project Manager |
| Economics Chief | Project Status Review Deliverables | Meetings E-mail | Monthly Prior to completion | Project Manager |
| Environmental Chief | Review Deliverables | E-mail | Prior to completion | Project Manager |
| Omaha District | Review Deliverables Project Briefing (PRB) | E-mail Routing Meeting | Prior to completion Monthly | PM/Section and Branch Chief |
| NW Division | Review Deliverables Project Briefing | E-mail Routing Meeting | Prior to completion Quarterly | PM/Branch Admin Branch Chief |
| City and County of Denver Stakeholders | Review Final Products Receive Input | Weblink Public Meetings | Prior to completion Milestone events | PM/PAO |
| District PAO | Review products presented to public | E-mail Routing | Prior to completion | PM/PAO |
| Public | Report Published | Weblink | Completion of study | PM/PAO/Sponsor |

12 CLOSEOUT

The process covers closeout of the Feasibility phase and its activities, including but not limited to completion of the fiscal completion, checking of contractor performance, and evaluations of the process.

The PM is responsible for closeout. However, the required actions may require participation of the PDT members, especially for closeout of financial cost accounts. The closeout would also apply in situations where the project might be terminated. All outstanding obligations and commitments will need to be cleared. The sponsor's PDT member responsible for keeping financial records will assist the PM in carrying out an audit of planning cost expenditures, including funds used for contracted services and those for in-kind services. The sponsor is required to submit quarterly or monthly work in-kind documentation, if applicable. The PM shall also ensure that all contracted services products have been accepted prior to making any final payments.

Omaha District procedures for closeout shall follow standard operation procedures. The amounts of federal and non-federal costs will be determined and a balancing of expenditures based on the approved cost share ratio will be determined. The outcome will determine the direction and amount of any funds to be transferred between the sponsor and the federal government.