Halligan Dam Rehabilitation Technical Report

for the

Halligan Water Supply Project Environmental Impact Statement

Prepared for:
U.S. Army Corps of Engineers
Omaha District

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1 Introduction

This technical report examines the current physical condition of the Halligan Dam and considers the implications of addressing those conditions in the context of the Halligan Water Supply Project Environmental Impact Statement (EIS). References to the observations, analytical results, and conclusions drawn in this report can be found in Chapters 2 and 4 of that EIS.

Fort Collins’ report, Halligan Water Supply Project Revised Draft Preliminary Section 404(b)(1) Guidelines Analysis (2017), describes the age and current condition of the Halligan Dam and suggests certain dam rehabilitation activities will be required if Fort Collins’ Proposed Action (an enlarged Halligan Reservoir) is not authorized. The following discussion addresses the need for future dam rehabilitation, the cost of that effort, and the financial and other resource impacts of dam rehabilitation efforts under the No-Action Alternative and action alternatives.

2 Current Dam Condition and Need for Future Rehabilitation

During its lifetime, Halligan Dam has been periodically inspected to ensure its safe operation. The most recent inspection occurred in May 2018 by dam safety engineers with the Colorado Division of Water Resources, Dam Safety Program.1 According to the Engineer’s Inspection Report (EIR),

“Overall, the dam is in conditionally satisfactory condition. The dam was constructed in 1906 and completed in 1910 and shows typical signs of its age. The dam is currently in satisfactory condition, but a plan needs to be developed to address repair and or rehabilitation in the future.”

According to the Dam Safety Program, a rating of Conditionally Satisfactory is defined as follows: The safety inspection indicates symptoms of structural distress (seepage, evidence of minor displacements, etc.) which, if conditions worsen, could lead to the failure of the dam. Essential monitoring, inspection, and maintenance must be performed as a requirement for continued full storage in the reservoir.

The dam safety engineer’s letter attached to the EIR states that there is “significant deterioration on the upstream and downstream faces” of the dam and that “the seepage through the dam and resulting deterioration appears to be increasing.” The letter goes on to state that “the primary concern is for continuing deterioration due to seepage through the concrete” and indicates that planning for dam rehabilitation needs to begin in order to extend the life of the structure.

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Under Fort Collins’ Proposed Action, the work completed to enlarge Halligan Dam would negate the need for any repairs or rehabilitation of the existing dam, unless dam conditions change noticeably in the near future. Fort Collins believes that under all other alternatives, including the No-Action Alternative, rehabilitation activities would likely commence within the next 10 years. Given the information provided in the EIR and the transmittal letter, it is reasonable to assume that rehabilitation activities would occur within the time horizon of the analysis contained in the Halligan EIS.

2.1 Estimated Cost of Dam Rehabilitation

An initial estimate of the cost of dam rehabilitation activities was included in the Fort Collins Alternatives Descriptions Action Alternative Report (MWH, June 2015). At that time, the estimated cost of rehabilitation activities was $7.6 million. Fort Collins updated that estimate to $8.7 million in mid-2018 based on increases in the costs of materials and supplies for other projects occurring over that period. With about 6,400 acre-feet of existing storage capacity, the cost to rehabilitate Halligan Dam and maintain its storage is an estimated $1,360 per acre-foot.

2.2 North Poudre Irrigation Company Decision to Abandon or Rehabilitate

If Fort Collins’ Proposed Action is not authorized and Halligan Dam is not enlarged, ownership of the dam would revert to the North Poudre Irrigation Company (NPIC). The NPIC Board of Directors (NPIC Board) would then be responsible for deciding whether to move forward with dam rehabilitation activities or abandon the dam when required to by the State of Colorado. It is Fort Collins’ opinion that the NPIC Board would likely decide to rehabilitate rather than abandon the dam because of the water storage value for both agricultural and non-agricultural shareholders.

The value of water storage in Larimer County currently exceeds the cost of rehabilitation by a substantial amount, $4,000 per acre-foot at a minimum. Further, non-agricultural shareholders currently account for about 75 percent of outstanding NPIC shares. Faced with replacing Halligan storage with more expensive water storage if they could find it, they would likely vote in favor of proceeding with dam rehabilitation rather than abandonment. Therefore, it is reasonable to assume that Halligan Dam would be rehabilitated under the No-Action Alternative or action alternatives.

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3 Class 5 Cost Estimate based on a conceptual level design, consistent with cost estimates for Halligan Project alternatives.
4 The estimated cost of dam rehabilitation was updated using the same methodology and assumptions as for the 2018 update to the alternative costs. See Addendum 1 of Harvey Economics’ Socioeconomic, Recreation and Land Use Technical Report (2016) for more detail.
5 Email from Adam Jokerst to Edward Harvey, June 29, 2018.
3 Socioeconomics Impacts to NPIC Shareholders

Once the decision is made to repair the Halligan Dam, the NPIC Board would decide how to finance the project. Funding could be accomplished through raising assessments, issuing debt, using reserves, or a combination of these mechanisms.

For the purposes of analysis for this EIS, the third-party contractor has assumed that the costs of Halligan Dam rehabilitation would be recouped by a pro-rata, one-time additional assessment on each NPIC share. Based on the 2018 cost estimate for dam rehabilitation activities, the additional assessment would amount to $870 per share. NPIC’s current annual assessment is $220 per share; the assessment rate has increased by about $10 per year in recent years and is anticipated to increase by $10 or less per year in the future. Financial impacts to NPIC shareholders are described below.

3.1 Fort Collins

Under future conditions, Fort Collins anticipates owning 37.4 percent of NPIC’s total shares under the action alternatives and 44.0 percent of NPIC shares under the No-Action Alternative. Assuming a pro-rata assessment on NPIC shares, Fort Collins would be responsible for about $3.25 million in dam rehabilitation costs under the action alternatives and about $3.83 million under the No-Action Alternative. In Fort Collins’ case, assessments paid to irrigation companies are considered operational costs and are covered by operational funds. Operational funds are largely generated through water rates. Therefore, an increase in NPIC assessments would likely result in an increase in Fort Collins’ water rates.

There are a number of ways that Fort Collins could implement the necessary water rate increases, including a larger one-time increase or smaller multi-year increases. Table 1 presents estimated increases in water rates assuming that Fort Collins would implement a one-time increase specifically to cover dam rehabilitation costs. Those increases would only be applicable in the year in which the additional NPIC assessments were charged. This scenario is likely a “worst-case” scenario, in terms of the magnitude of water rate impacts; depending on other expenditures at the time, Fort Collins would likely spread the costs of rehabilitation over three or more years. If these rate increases were spread over three years, the annual rate impact would be in the four to four and one-half percent range.

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6 Depending on the schedule of rehabilitation activities, NPIC might be able to spread out the assessment over a multi-year period, which could reduce the economic impacts to shareholders.

7 Historically, NPIC’s assessment rate has increased by about $10 or less per year; however, between 2014 and 2015, that rate increased by about $70 (from $130 to $200) mainly to address deferred maintenance.

8 Fort Collins currently owns 35.5 percent of total NPIC shares. The City’s future purchases of additional NPIC shares would likely come from existing agricultural shareholders.

9 Myriad factors are considered in any rate-making effort, including projected expenses, revenues, debt and other inputs. In general, no one project alone will drive water rates; a utility’s future financial needs are often addressed by a combination of revenues generated by water rates, use of reserves and by taking on additional debt.
### Table 1. Potential One-time Water Rate Increases due to Halligan Dam Rehabilitation

<table>
<thead>
<tr>
<th>Alternative</th>
<th>% One-Time Water Rate Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Collins' Proposed Action</td>
<td>0.00%</td>
</tr>
<tr>
<td>Expanded Glade Alternative</td>
<td>11.75%</td>
</tr>
<tr>
<td>Gravel Pits Alternative</td>
<td>11.75%</td>
</tr>
<tr>
<td>Agricultural Reservoirs Alternative</td>
<td>11.75%</td>
</tr>
<tr>
<td>No-Action Alternative</td>
<td>13.82%</td>
</tr>
</tbody>
</table>

*Note: No rehabilitation activities would be required for Halligan dam under the Proposed Action.*
*Source: City of Fort Collins, 2018.

#### 3.2 Other Non-Agricultural Shareholders

As of 2018, other municipalities, water districts and governmental agencies (i.e. Colorado State University and Colorado Parks and Wildlife) hold approximately 40 percent of NPIC shares. It is uncertain how each of those entities would pay for their share of dam rehabilitation costs; however, costs could be recouped through increases in water rates or other special charges or fees.

#### 3.3 Agricultural Shareholders

As of 2018, NPIC included about 550 agricultural shareholders. Together, those shareholders currently hold about 25 percent of total NPIC shares. However, assuming Fort Collins would purchase additional NPIC shares from agricultural shareholders under future conditions, agricultural ownership in NPIC would be reduced to about 23 percent under the action alternatives and to about 16.5 percent under the No-Action Alternative.

Given the estimated per share increase in assessments to cover dam rehabilitation costs, NPIC’s agricultural shareholders would be responsible for a total of about $2.0 million under the action alternatives and about $1.4 million under the No-Action Alternative. The actual number of NPIC shares owned by individual agricultural shareholder varies; however, on average, each agricultural shareholder owns about 4.5 shares and would be responsible for an additional one-time assessment of about $3,900.\(^{10}\) If NPIC were to spread these costs out over three years, for instance, annual costs would amount to a little more than $1,300 per year. This amount would represent an increased expense and reduction in the agricultural shareholders’ net income. The significance of this expense would depend on individual shareholders economic circumstances.

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\(^{10}\) This estimate assumes a decrease in the total number of agricultural shareholders under future conditions, rather than a decrease in the average number of shares per agricultural shareholder.
4 Impacts of Dam Rehabilitation on Physical Resources

Halligan Dam rehabilitation activities would affect each of the resource areas addressed in Chapter 3 and Chapter 4 of the EIS, including both flow-based resources and land-based resources. The impacts of the rehabilitation activities on those resources would be equal to or less than the effects of the Halligan enlargement activities surrounding the dam site as described under Fort Collins’ Proposed Action in Chapter 4. For each of the action alternatives and the No-Action Alternative, the impacts of dam rehabilitation activities would occur in addition to the effects described for alternative specific components.