Alternatives Analysis for the City of Durango to access its ALP Project water allocation from Lake Nighthorse

Durango, CO

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1. EXECUTIVE SUMMARY

The City of Durango is at increasing water supply risk due to aging infrastructure, drought and aridification, unplanned mine releases, and wildfire. The City has very limited raw water storage and therefore desires to improve water supply resiliency by accessing its allocation of Animas La Plata Project (ALP Project) water.

The majority of ALP Project water is allocated to the Southern Ute Indian Tribe (SUIT) and the Ute Mountain Ute Indian Tribe (UMUT); a small fraction of ALP Project water is allocated to the City of Durango (City). The City is considering developing infrastructure to access its ALP Project allocation, particularly raw water stored in Lake Nighthorse (LNH). Developing a pipeline and additional infrastructure for this purpose would improve the City’s raw water supply resiliency.

Durango’s total ALP Project allocation is for up to 3,800 ac-ft/year, based on a depletion amount of 1,900 ac-ft/year, including a storage entitlement of 2,133-ac-ft/year, equivalent to 695 MG.

Raw Water Storage

Currently Durango’s only accessible raw water storage is in Terminal Reservoir with maximum volume of 91 MG; this provides just over two weeks of storage at current average day demand. If the City could access stored water in Lake Nighthorse, the ALP Project water allocation would significantly increase the City’s stored water supply to over four months of storage at current average day demand (ADD).

Along with the potential future development of the LNH pipeline, the City recognizes that other aging water infrastructure must also be addressed. The access to another raw water source from LNH does not resolve, reduce, or mitigate the risks of the aging infrastructure.

Connection Point (CP) Alternatives: To access water from the ALP Project, there are currently three connection point options:

- **ALP Connection Point 1 (CP-1), 36” Valve:** There is existing infrastructure, including a 36” valve, near Ridges Basin Dam, designed for providing access to ALP Project water. From the valve, no additional infrastructure exists to convey water (i.e., there is no pipeline for delivery of the water or measurement facility). These facilities are currently not in use.

- **ALP Connection Point 2 (CP-2), Northside Intake Structure:** The Northside Intake Structure is located on the northside of LNH with an existing pipeline extending to County Road (CR) 210. These facilities are currently owned and used by other parties and operated by La Plata West Water Authority (LPWWA).

- **ALP Connection Point 3 (CP-3), Durango Pumping Plant:** This option would allow for access of ALP Project allocation pumped directly off the Animas River only. Connecting from the pump discharge to the City’s existing raw water pipeline would require a relatively short new pipeline. This option would not allow access to stored water in LNH; this does not meet the resiliency goals of the project.
Regarding CP-1, Durango has an interest in the 36" Valve and there does not appear to be an existing user agreement (note, the valve is not currently in use).

Regarding CP-2, the Northside Intake Structure has a pre-established user agreement. The ownership interests are held by SUIT, UMUT, and LPWWA; the City is not currently part of this agreement or an owner. To access ALP Project water from LNH from the Northside Intake Structure, the City would have to obtain some ownership or obtain a long-term lease of the infrastructure.

Regarding CP-3, connection to the discharge side of the river pump is required. Reversing flow on the Ridges Basin Inlet Conduit (which feeds from the Durango Pumping Plant to LNH) is not feasible; the elevation change exceeds the maximum, physically possible suction lift.

The recommended connection location is ALP CP-1, the 36" valve near Ridges Basin Dam. The City is a partial owner/interested member of this infrastructure, and the infrastructure has capacity to meet the City's resiliency goals.

**Pump Station (PS) Alternatives:** To convey ALP Project water from LNH up to College Mesa Water Treatment Plant (CMWTP), pumping is required. Two pump station alternatives were evaluated:

- **Pump Station 1 (PS-1), New Pump Station at Bear Traps:** This option evaluates construction of a new pump station at a location referred to as Bear Traps (on the south side of Larry Valdez Byway). From this location, pump discharge would connect to the existing 30" Santa Rita Pipeline for conveyance to CMWTP. This option would conserve head from the water surface elevation in LNH and reduce energy demand to pump to CMWTP.

- **Pump Station 2 (PS-2), Existing Santa Rita Pump Station:** This option evaluates utilizing the existing Santa Rita Pump Station (SRPS). Currently the SRPS pumps water from the Animas River intake to CMWTP. In this option, the proposed LNH pipeline would tie into the Animas River Intake pipeline, flow into the SRPS wet well, and the existing pumps would convey water into the existing 30" Santa Rita pipeline up to CMWTP. This option breaks head before the existing wet well.

The pump station alternatives evaluation included capital cost, operational and maintenance costs, and qualitative preference. PS-2, utilizing the existing Santa Rita Pump Station is recommended.

**Overall Project Alternatives:** For the pipeline alignment between the ALP Connection point and the Pump Station, multiple options were evaluated. The scope of work summarized in this report included an alternatives evaluation and development of a 30% design. **In conclusion, the three main project alternatives for accessing water stored in LNH and conveyance to the existing Santa Rita Pump Station are summarized below:**

- **Project Alternative 1, 48-inch pipeline from Ridges Basin Dam to La Posta Road, then 30-inch pipeline to SRPS:** Connect at the 36” valve (CP-1), install a shared 2.4-mile long 48” pipe down to La Posta Road, and install approximately 5-miles of 30” pipeline to the Santa Rita Pump Station (PS-2). The alignment enters the SUIT Tribal Reservation boundary and areas where archeological resources are known to exist. This alignment will impact multiple private residents and business owners. This is the most expensive alternative; however, it provides an opportunity for a
Alternatives Analysis
Raw Water Supply from LNH

collaborative project with other ALP Project members.

- Project Alternative 2, 30-inch Trenchless HDD from Dam to Gun Range: Connect at the existing 36" valve (CP-1), extend the shared pipeline 200-ft, and install a manifold. Then, for City use only, install a valve and metering vault and then horizontally directional drill (HDD) a 30" pipeline through the mountains directly towards Durango's Bodo area. Then continue with a traditional trench installation of the 30" pipeline to the Santa Rita Pump Station (PS-2). This option is less expensive than Project Alternative 1. Going directly through the mountains is technically feasible; however, it would be the longest HDD in Colorado to date and, therefore, has inherent risks.

Project Alternative 3, 30-inch pipeline along CR 210: Connect at the Northside Intake (CP-2) and existing pipeline and continue a 30" pipeline along CR 210 towards Durango and ending at the Santa Rita Pump Station (PS-2). This is the most cost-effective alternative, and its construction would have little impact to businesses and residents. The City is not currently an owner in the Northside Intake; this alternative would require use of up to all of the existing UMUT and SUIT intake capacity, through a future purchase or lease, which may not be possible to obtain.

Conclusion
The work concluded that three main Project Alternatives require further evaluation to determine the most financially, socially, and environmentally viable options. Collaboration opportunities also exist with other entities with ALP Project allocations. For a collaborative LNH pipeline project to succeed, the other interested ALP Association members must each define their own strategic plan, needs, and goals.

The next steps include continued discussions with the other ALP Association members through the ALP Association and Tribal Consultations. Through these discussions, the City can evaluate opportunities for a collaborative project and/or opportunities to gain ownership or use of the Northside intake. These discussions will help determine the most viable option for the project. The next design aspects include surveys, permitting, completion of user agreements, 60% design, 90% design, final design, and then construction using the Construction Manager at Risk (CMAR) delivery method. Introduction, project need, project benefits, and project purpose.
Alternatives Analysis
Raw Water Supply from LNH

Figure 1-1: Main Project Alternatives