A. Purpose

The focus of this feasibility study is to evaluate and refine the existing knowledge of the hydrogeology of the alluvial aquifer system in the Lost Creek Designated Ground Water Basin for the purposes of assessing the potential for aquifer recharge and storage implementation. Geographic, geologic, hydrologic, water quality, and infrastructure data will be collected and analyzed to evaluate the recharge potential, storage capacity, conveyance, and water quality characteristics in the study area. The scope of work is tailored to identify select sites or sub-basin areas for potential pilot project implementation.

B. Objectives

The objectives of this study are to compile, collect, and analyze hydrologic, aquifer property and water quality data to characterize the ground water resources in the alluvial aquifer and evaluate geographic, infrastructure, land ownership/use information for the purposes of assessing the potential for aquifer recharge and storage implementation. To address the needs of in-basin water rights holders and assist the management district in their decision-making processes, we propose to:

1. Characterize the configuration and extent of the alluvial aquifer within the Lost Creek basin;
2. Compile and present current and historic ground-water levels and water level trends;
3. Characterize the amount of natural recharge and estimate the available storage capacity in the alluvial aquifer;
4. Determine hydraulic and storage properties of the alluvial aquifer;
5. Present the spatial relationship with the underlying Denver Basin bedrock aquifers;
6. Characterize the land use and ownership; and
7. Identify the existing water delivery infrastructure.

C. Approach

Anticipated activities are described below and consist of historical data collection, field work to acquire new data, technical analyses, mapping, and reporting. This information and data will be formatted and entered into a geodatabase to accommodate analysis and display in Geographic Information System (GIS) compatible software.

Task 1 - Historical Data Compilation and Site Characterization ($38,500)

- Conduct literature review
- Involve local experts
- Obtain water well permit records from the office of the state engineer
- Obtain water-level and well data from the USGS database
- Obtain oil & gas production data collected by the Oil & Gas Conservation Commission
- Obtain water resource data compiled for the South Platte Decision Support System
- Obtain climatological data
- Characterize the alluvial aquifer
- Obtain land use/ownership data from relevant county agencies

- Identify the existing water delivery infrastructure

Task 2 – Field Data Collection ($69,100)
A field study workplan will be developed to fill some of the data gaps identified in Task 1. The fieldwork will consist of drilling and constructing observation wells, geological and geophysical logging, sediment sample collection, conducting aquifer pump tests, and monitoring seasonal water levels. It is anticipated that existing wells would be accessible for conducting aquifer pump tests and monitoring water levels.

- Collect water quality samples
- Install new monitoring wells
- Conduct additional aquifer tests
- Water level monitoring

Task 3 – Data Analysis, Evaluation, and Mapping ($28,500)
The objective of this task is to:

- Characterize the hydrogeology of the alluvial aquifer
- Characterize the quality of the ground water
- Investigate ground-water level changes with time
- Compute aquifer hydraulic and storage properties
- Present the spatial relationship with the underlying Denver Basin bedrock aquifers
- Present land ownership, land use, and infrastructure information
- Determine ground water flow directions
- Present ground water recharge and discharge areas
- Identify priority areas for potential aquifer recharge pilot studies.

Task 4 – Reporting ($29,900)

- Stakeholder Meetings
- Project Report

Task 5 - Project Management ($7,000)
This task includes coordination of staff responsibilities and duties, coordination of stakeholder meetings, tracking work accomplished, budget and schedule management, accounting support, and reporting the status of work activities.

D. Budget

The following table summarizes the estimated costs to complete the proposed approach.

Task	Description	Budget Amount
1	Historic data/site characterization	$ 38,500
2	Field Data Collection	$ 69,100
3	Data Analysis, Evaluation, and Mapping	$ 28,500
4	Reporting	$ 29,900
5	Project Management	$ 7,000
	Project Total	**$ 173,000**
	Colorado Geological Survey in-kind match	$ 10,000
	Lost Creek Management District match	$ 3,000
	Total Matching Contributions	**$ 13,000**
	Water Supply Reserve Account Request	**$ 160,000**

E. Contacts

Tom Sauter, General Manager, Lost Creek Management District, phone 303-886-4475, sauter@esrta.com

Ralf Topper, Senior Hydrogeologist, Colorado Geological Survey, phone 303-866-2029, ralf.topper@state.co.us