ENGINEERING SERVICES REQUEST
AUTHORIZATION TO PROCEED

To: Underwood Engineers, Inc. (**Engineer**)
25 Vaughan Mall
Portsmouth, New Hampshire 03801

ESR No.: **#1**
File No.: N2911
Date: July 15, 2021
Description: **Water System Improvement Study**

From: County of Carroll (**Owner**)
Office of the Commissioners
95 Water Village Road
Ossipee, NH 03864

Owner's Contact(s) (this project): Will DeWitte, Director of Public Works
Engineer's Contact(s) (this project): Lynnette Carney, P.E., Project Manager

Under agreement for Professional Services as Consulting **Engineer** for the **Owner** (General Services Agreement UE #_____ dated _____), **Engineer** is authorized to proceed with the following work:

Description:

The Carroll County Farm complex and approximately 40 homes in Ossipee Village are served by the Carroll County Water System. The sources of supply include two deep bedrock wells and three dug wells, which are also referred to as springs. The artesian output of two of the dug wells/springs flows by gravity to the third dug well/spring from which water is pumped through a metering and treatment building, where chlorine is added, and then into an in-ground 200,000-gallon concrete reservoir. The discharge from each bedrock well also flows through the metering and treatment building, is chlorinated, and flows to the reservoir. Water flows by gravity from the reservoir through a 10-inch D.I. main to the County Farm, and then onto the village via County Farm Road, Route 28, and Route 171 where the size is reduced to 8-inch in the village center and several smaller diameter branch mains serve other streets.

Water supply capacity has been an issue in the past, but there have been no supply improvements for over 20 years. The current supply capacity and water levels of the bedrock wells are unknown. Demands have increased due to the addition of new facilities at the County Farm (new jail in 2003 and a new nursing home in 2010) and the addition of several residential connections. There is also potential for increased future water demand in the Village.

The 10-inch and 8-inch D.I. water mains noted above were installed in 2001/2002. However, the rest of the distribution system consists of 4-inch and smaller cast iron and PVC mains which are older. In some locations, fire hydrants are connected to 4-inch mains which does not meet current design standards.

Carroll County requires an engineering evaluation and study to determine the following:

- Capacity of existing sources of supply
- Projected demands and ability of existing supplies to meet those demands
- Fire flow capability throughout water system
- Recommendations on
    - Rehabilitating or improving existing supply sources
    - Adding a new supply source or sources to meet demands
    - Distribution system improvements to ensure adequate fire flow
    - Rate adjustments to help support recommended improvements

Underwood Engineers proposes to conduct the following scope of work to meet the needs of the Carroll County Water System as noted above.

Scope of Work:

Engineer will provide the following engineering services:

The initial effort will be primarily a desktop analysis aided by field work to evaluate sources and equipment and conduct fire flow tests and/or supply flow measurements. If it is determined that pump tests of the existing wells, or evaluation of the wells requiring the efforts of a licensed water well contractor are necessary, this work will be carried out in a subsequent phase.

The scope of the engineering evaluation shall include the following tasks:

- Initiate the project with a kick-off meeting to discuss the project scope of work and goals to ensure that all parties are on the same page, as well as to either collect, or identify information needed to complete the evaluation
- Inspect the existing water supply and storage infrastructure (without dewatering) to determine the general condition and note any required upgrades. This inspection will be coordinated to occur on the same day as the kick-off meeting
- Review existing reports, studies, plans and available information on the Carroll County water system
- Determine, or make the best possible estimate of, the current sustainable capacity of each of the existing supply sources
- Determine the status of designed well water level infrastructure from 2001 and if this exists, what is necessary to make it functional
- Evaluate source water quality (from existing records) and any recommended treatment changes
- Project demand for water in the County Farm and Ossipee Village for a 20-year planning period, including potential development in Ossipee Village or any planned facilities on the County Farm
- Analyze required or needed fire flow at the County Farm and in Ossipee Village
- Perform field fire flow tests at selected locations in the distribution system, to better understand existing system-wide fire flow capability

- Develop a computerized water model of the County Farm water system for use in evaluating both current available fire flow at any location and recommended water main improvements to achieve the needed fire flow. The results of the field fire flow tests will be used to calibrate the model to ensure it is accurately representing the system.
- Evaluate the current County rate structure and compare to similar size systems in the State. Determine proportional use by the County and the Ossipee Village users and use this to help develop an equitable rate structure that supports operational and capital costs.
- Work with the County to identify possible funding sources to assist with implementation of any water system improvement recommendations. This will include at a minimum, the Drinking Water State Revolving Fund (DWSRF), Drinking Water Groundwater Trust Fund (DWGTF) and Community Development Block Grants (CDBG).
- Produce an engineering report to document the existing system, supply capacity, projected demand, condition of existing supply and storage infrastructure, and fire flow capability throughout the system. The report will include recommendations on:
    - Need, or not, for additional supply sources
    - Additional required investigations such as pump tests, inspection of pumping equipment or new source investigations
    - Required upgrades to existing supply, treatment, and storage infrastructure
    - Distribution system improvements to both modernize the system as well as provide needed fire flows
    - Changes in the rate structure
    - Possible funding sources that the County might utilize to proceed with any proposed upgrades
- Provide a draft copy of the report to the County and attend a County Commissioners meeting to discuss/present the report and seek comment
- Provide a final copy of the report based on input from the County

Owners Responsibility:

Owner shall make available to the Engineer the following:

- Existing reports on supplies, water system and water quality
- Existing mapping of water system
- If available, past fire flow test results and/or fire flow availability as determined by the Insurance Services Office (ISO)
- Any special water system requirements (CMS, etc.)
- Water production records for the last five (5) years
- Access to all water system facilities

Work Not Included:

The following is not included in the Scope of Work:

- Design, bidding, or construction services
- Subsurface investigations

- Water quality sampling or analysis
- Well pumping tests

Budget Costs:

Task 1 – Water System Improvement Study	$15,000.00
TOTAL	**$15,000.00**

Fees for engineering services will be on an hourly basis for the personnel involved. Such hourly fees will be based on the Engineer's technical payroll plus an allowance to cover overhead and profit. Fees also include reimbursement for transportation expenses (per mile), out-of-pocket travel expenses (tolls), prints, telephone calls and miscellaneous materials that may be required to complete the work.

Suggested budgets, as used herein, are best estimates by Underwood Engineers. The budgets are based on available information and prior to a detailed research on the Project. Budgets are not intended to be fixed prices but are reasonable estimates of average costs to complete projects of similar size. Budget will not be exceeded without written authorization.

Schedule:

Underwood Engineers, Inc. proposes the following Schedule for the project.

Award Engineering Contract	July 2021
Conduct Field Investigations/Site Visits & Develop Computer Model	July - August 2021
Perform Evaluations and Write Report	September - October
Draft Report – Present at County Commission Meeting	November 2021
Final Report	December 2021

Approval:

Approval and authorization to proceed with the work:

8/11/21

County of Carroll Commissioners Date
Terry McCarthy, Chairman

Keith A. Pratt, P.E., President Date
Underwood Engineers, Inc.