

September 26, 2018

Project R041.06023.015

Mr. Dwight Doughty
Maine Department of Transportation
16 State House Station
Augusta, Maine 04333

SENT VIA E-MAIL

RE: Hydrogeologic Evaluation
Maine Department of Transportation Belgrade Camp
Belgrade, Maine

Dear Mr. Doughty:

Ransom Consulting, Inc. (Ransom) is pleased to submit this proposal to complete a hydrogeologic evaluation of the Maine Department of Transportation (MaineDOT) camp located at the intersection of Route 135 and Route 8 in Belgrade, Maine. Ransom's scope of work will include the following:

- **Task 1:** Review of available geologic literature and mapping information for the MaineDOT Belgrade Camp property and field reconnaissance for siting a water supply production well and monitoring/observation wells;
- **Task 2:** Geophysics (3 Transects): Ransom and their subcontractor Northeast Geophysical will complete three (3) electrical resistivity transects:

Proposed Resistivity Line 1: approximately 350-foot long resistivity survey transect spanning the length of the camp property near the northern end to the site in an east west orientation.

Proposed Resistivity Line 2: approximately 450-feet long and perpendicular to Resistivity Line 1 at the camp property. Resistivity Line 2 is proposed to extend from north to south through the camp site.

Proposed Resistivity Line 3: approximately 300-foot long Resistivity Line in an east-west orientation on the MaineDOT owned property located west of the camp property with access off Route 135.

The electrical resistivity survey is anticipated to identify water-bearing stratigraphy in the overburden along each transect line. Each resistivity line is estimated to be completed in a half a day (1.5 days total). Ransom will coordinate and facilitate the geophysical resistivity survey at the properties. Upon completion of the survey, Northeast Geophysics will produce a report summarizing their methodology and results of the geophysical survey. Review and data interpretation of Northeast Geophysics' report will be completed by Ransom in order to determine suitable locations for overburden observation wells that may be drilled at the properties that may intercept suitable water-bearing stratigraphy identified by the geophysical resistivity survey.

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60 Valley Street, Building F, Suite 106, Providence, Rhode Island 02909, Tel (401) 433-2160

- **Task 3:** Creation of a Health and Safety Plan (HASP), mark the properties for Dig Safe, and coordinate with a monitoring well driller to install up to five (5) 2-inch overburden monitoring wells at the Camp property and three (3) 2-inch monitoring wells at the property located to the west of the Camp property. The 2-inch monitoring wells will be used to determine the aquifer characteristics, water chemistry, and the potential location of a proposed 6 or 8-inch water supply production well, and to serve as monitoring points during a future 48-hour pumping test to define hydraulic characteristics of the overburden aquifer for the wellhead protection area (WHPA) and well sustainability. For purposes of this proposal, we have assumed that all wells will extend to a maximum depth of 50 feet below ground surface.
- **Task 4:** Collection of water samples from the monitoring wells for laboratory testing. Water samples will be collected in laboratory provided containers and submitted to Alpha Analytical for an initial screen of the following parameters of concern: arsenic, chloride, coliform (positive or negative), Ecoli, iron, manganese, nitrate, potassium, sodium, and volatile organic compounds (VOCs).
- **Task 5:** Water supply (6-8 inch) well construction. Ransom will scope the installation of the water supply well. This will include creating bid specifications and assisting the MaineDOT secure and contract with a qualified well driller. During the water supply well advancement, Ransom will be on-site to verify that the driller is adhering to the drilling specifications. Following well installation, Ransom will supervise well development. Pump installation and the waterline engineering and service connections are assumed to be included as a subsequent phase of the project.
- **Task 6:** Coordination and oversight of a 48-hour pumping test with water quality sampling for full suite of parameters under CFR 40 Section 141. Ransom will handle the coordination of the pumping testing. Water level drawdown and recovery measurements for the 48-hour pump test will be completed by Ransom or the contracted well driller throughout the duration of the pumping test at designated time intervals with Ransom coordination at beginning and end of the test. The 48-hour pumping test will include monitoring of water levels in the pumping well and other onsite wells to establish hydraulic properties in the overburden and determine well interaction effects, including the use of pressure transducers that will be installed in the pumping well and observations wells. Ransom will also collect and submit water samples for laboratory analysis.
- **Task 7:** Data interpretation and completion of a report and application for approval of the well for public water supply with the Maine Drinking Water Program. Ransom will prepare the required forms for submission to the Maine Drinking Water Program, which will include a Request for Preliminary Well/System Approval (prior to constructing the new water supply well) and a Request for Final Well/System Approval after the well construction and testing is complete.

The results of the tasks listed above may lead to the development, testing and permitting of additional overburden water supply wells. The estimated costs for engineering services listed below are only for this proposed phase of work up to the conclusion of testing and permitting for one new water supply well.

PROJECT COST

This project will be invoiced on a time-and-materials basis in accordance with Ransom’s *Fee Schedule* (Attachment A). Based on the tasks outlined above, Ransom estimates the cost to complete this project at \$137,199. Costs for each of the tasks of the proposed work are provided below.

Task	Description	Ransom Fees	Subcontractor Fees
Task 1	Review of Geologic Literature/Field Reconnaissance	\$2,100	---
Task 2	Geophysics	\$2,560	\$5,775
Task 3	HASP/Drilling Coordination/Oversight of 5 Overburden Monitoring Well Installations & Production Well Design	\$6,795	\$17,600
Task 4	Monitoring Well Water Quality Sampling & Laboratory Testing	\$2,610	\$3,000
Task 5	Water Supply Well Construction ¹	\$14,470	\$56,650
Task 6	48-hour Pump Test Coordination & Monitoring with Pressure Transducers	\$9,889	\$10,450
Task 7	Data Analysis, Reporting and Well Permit Applications	\$5,300	---
	Subtotals	\$43,724	\$93,475
	TOTAL ESTIMATED COST		\$137,199

Notes:

¹ This task is highly dependent on the depth and type of water supply well that is constructed. Ransom recommends seeking competitive bids from water supply drillers in Maine.

AUTHORIZATION

If you are in agreement with the terms of this proposal, Ransom will take MaineDOT's Assignment Letter as our authorization to proceed.

We are pleased to have the opportunity to present this proposal and be of continuing service to you. If you have any questions regarding the proposed scope of work, please feel free to call us.

Sincerely,

RANSOM CONSULTING, INC.



Aaron R. Martin, C.G.
Project Manager



Nicholas O. Sabatine
Vice President and Senior Geologist