LUMOS & ASSOCIATES

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June 10, 2025

Chantell O'Neal
Assistant Director; Engineering Division
416 N Franklin Street
Fort Bragg, CA 95437

Delivered Via Email: coneal@fortbragg.com

Subject: Revised Task Order Request – Newman Reservoir Booster Pump Station Proposal

Dear Ms. O'Neal

Lumos & Associates, Inc. is pleased to provide you with this proposal for engineering and related services for the Newman Reservoir Pump Evaluations Project.

Project Understanding

The City of Fort Bragg (The City) is presently completing final design and/or permitting on two (2) interrelated projects – the Raw Water Line Replacement Project that replaces portions of the existing raw water line from Waterfall Gulch to the Water Treatment Plant (WTP), and the New Reservoir Project that includes construction of up to three (3) new reservoirs in series to augment raw water capacity. Presently, pumping systems (or modifications to existing systems) are contemplated at Newman Reservoir under the Raw Water Line Replacement Project and at the WTP under the New Reservoir Project. An existing design for a booster pump station located within the downstream toe of the earthen dam of Newman Reservoir has presented construction challenges due to the required excavation into the existing dam embankment which increases the risk of seepage and internal erosion through the dam. An additional challenge with the existing design includes the presence of protected trees, biological restrictions, and environmental constraints within the proposed construction area. Due the aforementioned restrictions, the City is hired a biological consultant to investigate the impact on installing an intake into Newman reservoir and it was determined that sensitive wildlife will not be impacted.

The City has requested that Lumos and Associates, Inc. (Lumos) provide a design for a proposed booster pump station (BPS) which will utilize an intake installed within Newman reservoir. The city has stated that they do not wish to use self-priming, suction lift pumps and that the area adjacent to the proposed motor control center structure shall be utilized for lift station infrastructure.

In preparation of this Task Order Request, Lumos has visited the site to help determine viable design alternatives. Lumas has also reviewed documents provided by the City and conducted several virtual meetings. Some of the documents reviewed include:

- Proposed Raw Water System Process Flow Diagram
- Conformed Documents (Plans); Raw Water Line Replacement Project, Segments 2-5
- Final Geotechnical Report; Raw Water Pipeline Replacement Project
- Existing Conditions Survey; Newman Reservoir Pumphouse
- Preliminary Plan Sheet, Simpson By-Pass at Newman Reservoir

We propose the following tasks to accomplish this scope of work.

Scope of Services

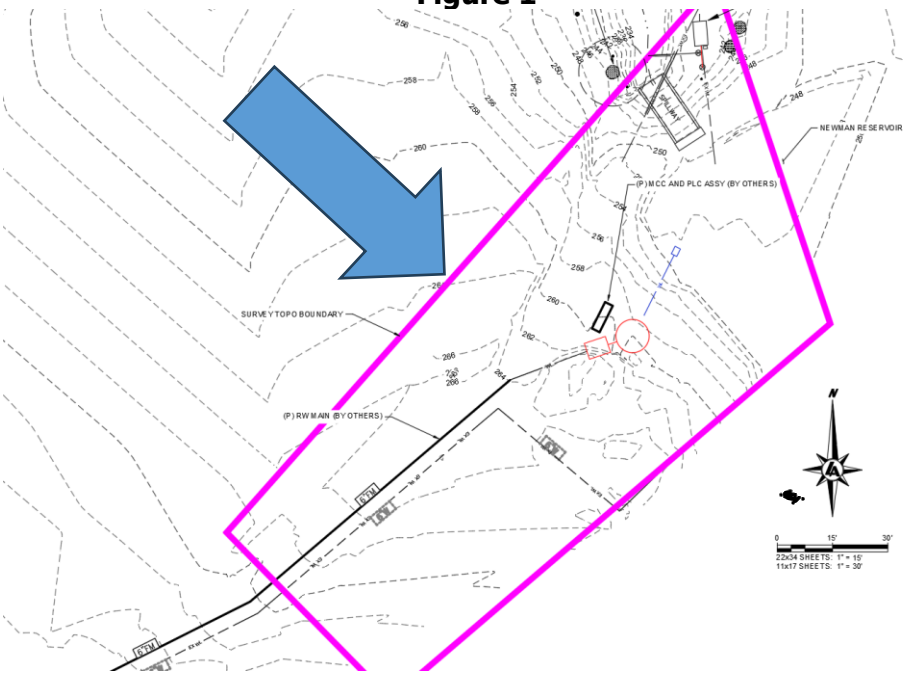
Task 1 – Topographic Survey

Lumos will prepare a topographic survey map at 1" = 20' scale with 1 foot contour interval accuracy in accordance with National Map Accuracy Standards for the project area. All existing surface improvements, trees greater than 12" dbh defined by species with greater detail on two (2) Mendocino Cypress, visible evidence of utilities, fences, spillway walls and flowline of approximately 50' below the existing spillway. Inverts of all measurable utilities within the project area (including pipe size, orientation, and material where observable) will be shown.

Project datum will be referenced to modified state plane coordinates and NAVD88. Existing survey control by others will be located and referenced on the survey. Deliverables will include a signed PDF and CAD files, including an Autodesk Civil 3D surface with appropriate breaklines.

Lumos will perform a bathymetric survey of the reservoir bottom by collecting field shots with an extended survey rod from a float tube or similar personal vessel. Points shall be collected on an approximate 10'x10' grid within the project area to support the design of the intake structure and gravity pipe design.

Figure 1



Conditions and Assumptions:

- It is assumed that the site will be made accessible by the City for survey vehicles, personnel and equipment as required to complete the work within this task

- It is assumed that existing tree removal will occur at the expense of the City prior to mobilization of survey crews in order to allow drill rig access for boreholes. If tree removal timeframes take longer than the assumed 1 week after notice to proceed, the proposed schedule will need to be extended.

Payment:

- The services for this task will be billed on a Fixed Fee Basis.

Task 2 – Geotechnical Investigation

Under this task, Lumos will determine the soil conditions and make recommendations with respect to the site soils for the proposed project.

For the Geotechnical scope of work, Lumos will complete a field investigation that will consist of two (2) subsurface borings, at the proposed site. Exploration depths will be from 20 to 30 feet below ground surface, or practical refusal, whichever comes first. Samples will be collected from the surface, and at intervals of between 2½ and five (5) feet below ground surface. Lumos will provide the drilling and the USA dig clearance.

Lumos herein proposes to provide sampling of each exploration, classify the encountered soils in accordance with the Unified Soil Classification System (USCS), and conduct laboratory testing on the samples collected. Additionally, Lumos propose to perform engineering analyses and calculations and develop a Geotechnical Investigation Report that will discuss the geologic setting, seismic considerations, exploration and site condition, field and laboratory test data, and our conclusions and recommendations from a Geotechnical perspective. Our Geotechnical Investigation will be prepared by a Registered California Civil Engineer and will specifically include the following services:

Field Investigation will include:

- USA Dig Clearance
- Location of Exploration Borings
- Logging of all Soil Profiles Based on USCS
- Water Table Measurement, if Encountered

Laboratory analysis may include:

- Atterberg Limits (ASTM D-4318)
- Grain Size Analysis (including Fines content) (ASTM C-136)
- Moisture Density Curve (ASTM D-1557)
- Direct Shear (ASTM D-3080)
- Moisture Content and Unit Density (ASTM D-2937)
- Ph/Resistivity/Soluble Sulfates

Report, Recommendations, and Conclusions:

- Exploration Logs
- Soil Types and Classification
- Laboratory Test Results

- Site Geology
- Seismic Considerations
- Geotechnical Discussion
- Modulus of Subgrade Reaction (K-Value)
- Shear Strength Parameters of Site Soils
- Lateral Earth Pressures (active, passive, and at rest)
- Backfill Recommendations
- Portland Cement Concrete Recommendations
- Groundwater Level, if encountered

We can begin work within one (1) to two (2) weeks of Authorization to Proceed. Fieldwork for the drilling will take one (1) day to complete. Laboratory testing will be assigned upon completion of the fieldwork, and will take one (1) week to two (2) weeks. The analysis and report preparation is anticipated to take up to one (1) week. Therefore, we have estimated a time frame of approximately four (4) to five (5) weeks – from authorization to proceed work – to complete this project. However, verbal results may be provided, as they become available

Deliverables:

- Electronic PDF of the Geotechnical Investigation Report

Conditions and Assumptions:

- Soil and/or groundwater contamination evaluation is not included.
- It is assumed that the site will be made accessible by the City for crew vehicles, personnel and equipment including a drill rig as required to complete the work within this task.
- It is assumed that existing tree removal will occur at the expense of the City prior to mobilization of geotech crews in order to allow drill rig access for boreholes. If tree removal timeframes take longer than the assumed 1 week after notice to proceed, the proposed schedule will need to be extended.

Payment:

- The services for this task will be billed on a Fixed Fee Basis.

Task 3 – Booster Pump Station Design

Under this task, Lumos will prepare the design of a booster pump station which will convey raw water from Newman Reservoir to future proposed reservoirs at a rate of 150 to 300 gallons per minute. Additionally, the station will be designed to pump water into Summers Lane reservoir with no specific target flow rate using a valve cluster that is currently under construction (design by others). The proposed lift station will consist of a wet well utilizing submersible, solids handling pumps. The wet well will be fed by gravity piping installed within the reservoir's bank and bed. The design will include a discharge assembly vault containing appurtenances and a flow meter.

The proposed wet well will be located adjacent to the southwest bank of the Newman Reservoir at the location of the motor control centered (MCC) structure which is currently under construction. The design will take into consideration the protection of the Mendicino Cyprus trees on the site, but it is anticipated that other trees will require removal to accommodate improvements.

The proposed lift station will be designed to work in conjunction with the existing gravity discharge and the existing intake assembly will be protected in place; Due to their poor condition, the project will include replacement of the meter, fittings and appurtenances inside the existing meter vault; The lift station discharge piping will tie in to the proposed force main alignment (designed by others) which is currently under construction

Lumos will provide a brief basis of design technical memorandum which summarizes the basis of design for pump and motor selection, wet well sizing, and other components selection.

Under this task, Lumos will perform the following:

- Attend virtual coordination meetings with the design team and the City to review project components, budgets, and schedule.
- Project Management which includes scheduling meetings and invoicing for billing
- Verification of the existing system curve using documents and record drawings provided by the City
- Basis of Design summary technical memorandum (approximately 5-pages)
- Selection of a location for a proposed booster pump station including wet well and valve vault
- Booster pump station design and equipment selection including intake assembly, pumps, wet well, piping, fittings, precast vault, flow meter, and appurtenances.
- Modifications and improvements to the existing meter vault
- Coordination with the City regarding compatibility with existing equipment that has already been procured during construction which may constrain design including electrical equipment
- Production of 100% civil improvement plans, including:
    - Cover Sheet
    - General Notes and Abbreviations
    - Survey Control
    - Existing Site conditions
    - Improvements plan overview
    - Site grading
    - Booster pump station design, plan and section views
    - Booster pump station details
    - Meter Vault Improvement details
    - Connection Details
    - General Details
    - Sheet Specifications to be included in the plan set
- Production of a Conformed plan set incorporating the City's review comments on the 100% submittal

Deliverables:

- Electronic PDF of the Basis of Design Memorandum
- Electronic PDF of the 100% design plan set for the City's Review
- Electronic PDF of the Conformed plan addressing review comments by the City

Conditions and Assumptions:

- The final location of the booster pump station will not be known until after the completion of topographic survey and geotechnical report.

- The design will assume that the reservoir will be drawn down to a level low enough to accommodate improvements. A dewatering plan and/or cofferdam design is not included in this proposal.
- It is assumed that the valve upstream of the meter vault assembly can be closed for construction of proposed improvements to the existing meter vault assembly.
- It is Lumos' understanding that the MCC currently under construction may be relocated further west due to geotechnical conditions. Lumos is assuming that the wet well will still be located in the original MCC location. However, it may be necessary to modify the design to include submersible reservoir pumps if the wet well needs to be relocated.
- It is assumed that the existing meter vault assembly will remain in place
- It is assumed that ANSI NSF61/372 certified components will not be required.
- It is assumed that tree removal will be required to accommodate the proposed improvements.
- This scope does not include evaluation or identification of root zone of protected trees. The City shall be responsible for any associated arborist, tree specialist, and/or tree removal fees and/or permits.
- This scope does not include geotechnical identification and/or mapping of the extent of the existing dam embankment. It is assumed that all pipe, fittings, and appurtenances located upstream of the existing meter vault fall within the engineered fill of the dam embankment.
- Lumos understands that some electrical equipment including the Motor Control Center (MCC) and service entrance equipment has already been procured or has been ordered and that modification of that equipment may result in long lead times or additional owner costs to the City. Lumos will attempt to use the electrical equipment procured for the previously designed booster pump station as a design constraint. However, Lumos cannot guarantee compatibility prior to finalizing a design. Discrepancies with the original pump system curve and other factors may lead to a different pump motor requirement than the prior design. The City should be aware that a different utility transformer, service entrance, MCC, and/or other electrical equipment may be required for operation.
- In order to accommodate existing electrical equipment, it is assumed that there is no efficiency requirement for either pumping scenario. Lumos will attempt to select equipment that is as efficient as practicable.
- It is assumed that the City is aware that limitations related to the existing electrical infrastructure may limit the design flow rate to a value lower than 150 gallons per minute.
- It is assumed that the maximum solids handling size for the proposed pumps will be 2" in diameter. It should be noted that the size and type of solids entering the wet will is dependent on upstream intake screening that is not a part of this project.
- This task does not include land acquisition assistance including, but not limited to, permitting requirements, easement procurement, rights-of-way procurement, prescriptive rights assessment, or other items related to the underlying land and/or properties. If required, these services can be provided under a future proposal.
- This proposal does not include any permitting services, permit applications, or associated permitting fees and it is assumed that all permitting including, but not limited to, building, electric, environmental, tree removal, county, local, state, and/or federal permits will be the responsibility of the City.
- This proposal does not include stream, creek, or waterway delineation.

- While the March 2022 Geotechnical report entitled: *City of Fort Bragg Raw Water Pipeline Replacement - Segment 2 - 5 Design Project* by Crawford & Associates was provided to Lumos by the City, a new geotechnical investigation will be required due to the change in location of the proposed station.
- The City will provide Lumos and its subcontractors with access to the site for Survey, Geotechnical, and Engineering Design as required.
- In order to achieve the project's proposed schedule, Lumos has assumed a City review period of three (3) calendar weeks to provide comments. If review timeframes take longer than the assumed three weeks, the proposed schedule will need to be extended.
- An opinion of probable construction cost is not included in this proposal.
- This proposal includes one site visit for three Lumos personnel.
- No additional site visits are included in this proposal.
- Construction administration services including submittal reviews are not included in this task but may be included under an amended scope.
- Due to the City's scheduling requirements, only a 100% level planset and a single round of comments will be provided as a submittal.

Payment:
- The services for this task will be billed on a Fixed Fee Basis.

Task 4 – Booster Pump Station Electrical Design
Lumos will utilize J Calton Engineering as the electrical engineering subcontractor for electrical design services related to the booster pump station designed under Task 3. This task includes electrical design phase services, consultation, calculations, and construction documents with sheet specifications suitable for construction. See attachment A for J Calton Engineering's electrical design scope.

Deliverables:
- E-sheets to be included as part of the 100% level design plan set.
- Electrical sheet specifications to be included with the 100% level design plan set.
- E-sheets to be included as part of the Conformed plan set incorporating comments from the City.

Conditions and Assumptions:
- Instrumentation design, sheets, and specifications are by others (not a part)
- The City will provide Coleman Engineering E-sheet DWGs from the current conformed improvements planset
- See Attachment A for additional conditions and assumptions.

Payment:
- The services for this task will be billed on a Fixed Fee basis at cost plus 15%.

Task 5 – Permitting Assistance
Under this task, Lumos will provide the City limited permitting support which will include the production of exhibits and other project permitting support tasks as requested by the City.

Conditions and Assumptions:

- This task assumes that determination of required permits, fitting out permit applications, permit fees, and submitting permit documentation will be the responsibility of the City.

Payment:

- Work performed under this task will be billed on a time and materials, not to exceed (T&M NTE) basis, in accordance with our current fee schedule.

Task 6 – On-Call Services

Lumos & Associates will be available to complete additional work and/or attend project meetings not otherwise specified in this scope of services and as requested by the Client. Lumos shall receive written authorization from the client prior to commencing any work under this task. Work performed under this task will be billed on a time and materials (T&M) basis in accordance with our current fee schedule.

Fee Summary

The tasks described in the Scope of Service will be completed for the following fees:

Task Number	Description		Fee
Task 1	Topographic Survey	$	21,000.00
Task 2	Geotechnical Investigation	$	24,000.00
Task 3	Booster Pump Station Design	$	126,900.00
Task 4	Booster Pump Station Electrical Design	$	16,700.00
Task 5	Permitting Assistance (T&M NTE)	$	10,000.00
Task 6	On-Call Services (T&M)		TBD
	Total		**$ 198,600**

Lumos and Associates, Inc. will send monthly progress billings on this project. The amount of these billings will be based upon the percentage of work completed. The terms are 'Due Upon Receipt' and accounts are past due after 30 days.

Schedule

Task Number	Description	Finish Date
	Executed NTP (Assumed)	*Mon 6/16/25*
Task 1	Topographic Survey	Mon 7/7/25
Task 2	Geotechnical Investigation	Thurs 7/24/25
Task 3	Booster Pump Station Design	Fri 9/19/25
Task 4	Booster Pump Station Electrical Design	Fri 9/19/25

Note that the schedule is subject to change based on the conditions discussed herein.

Sincerely,

Mara Quiroga, P.E.
Project Manager

Jonathan Lesperance, P.E.
Group Manager

Attachments

- Attachment A – J Calton Engineering Electrical Design Scope

ATTACHMENT A

City of Fort Bragg - Newman Pump Station Modifications
Electrical Design Fee

By: J Calton Engineering
Date: April 24, 2025

Elec Design Drawing Description	No. of Dwgs	$225 Design MH/Dwg	Design Cost
Elec Legends and Abbr	1	1	$225
Detail Sheets - new details for submersible pumps	1	3	$675
Overall and Detail Site Plans Modifications	2	3	$1,350
Single Line, Load Calcs Modifications	1	4	$900
Equipment Elevations Modifications	1	4	$900
Building Plans (Power, Lighting) - delete bldg., add wet well	2	2	$900
Pump and Misc Schematics Modifications	2	1	$450
Conduit and Cable Schedule and Fixture Schedules Modifications	1	2	$450
I/O List and Fixture Schedule Modifications	1	1	$225
PLC Panel Drawing Modifications	2	0.5	$225
Drawing Subtotals	***14***		***$6,300***
	Drawing Fee	**28**	**$6,300**
	CAD fee		**$4,410**
	Change Order Write up, with revised Specifications	**10**	**$2,250**
	QA/QC	**4**	**$900**
	Meetings, Project Management	**3**	**$675**
	Elec Design Fee:		**$14,535**

Notes:
1. JCE to provide CAD work, backgrounds by Lumos & Associates. L&A to provide any Spec formatting.
2. Deliverables shall be electronic only (CAD and PDFs drawings, and ~~Word.doc specs~~)Electrical Specs shall be sheet specs
3. Assumes electrical service is existing and sufficient. No utility scope included.
4. No off site SCADA work included in scope.
5. No site visit included and required.
6. No cost estimate included.
7. No control strategies included, to be provided by others.
8. No standby power included.
9. Assumes receive CAD files from Conformed drawing set and authorized to use from Coleman.
10. Rates will increase after Dec 31, 2027.

Schedule*	Week of	Week	Week of*
Project Start after Signed SubAgreement. Review equipment submittals.	May 5th	1	June 16th
New pump sizes and CAD files from L&A. Receive Coleman CAD files.	May 12th	2	June 23rd
Initial electrical redesign, calculations, redlines, CAD, specs	May 19th	3	June 30th
Initial electrical redesign, calculations, redlines, CAD, specs	May 26th	4	July 7th
L&A and City review initial design documents.	June 2nd	5	July 14th
Final electrical redesign, calculations, redlines, CAD	June 9th	6	July 21st
Final electrical redesign, calculations, redlines, CAD	June 16th	7	July 28th
Submit Final Electrical Documents	June 23rd		Aug 4th

**Schedule subject to change pending delays due to conditions including, but not limited to data requests and plan reviews by the Owner. No additional fees will be charged for standby time caused by Owner delays.*