Town of Henniker, NH
Request for Qualifications for Engineering Services
French & Keyser Pond Watershed-based Plan for Total Phosphorus Mitigation
Henniker, NH

Posted date: May 28, 2021 Due Date: June 11, 2021

I. INTRODUCTION:

The Town of Henniker is soliciting Statements of Qualifications (SOQs) from interested consulting firms working with a Certified Lake Manager to develop a watershed management plan that meets the United States Environmental Protection Agency (USEPA) requirements for nine-element (a-i) watershed-based plans to mitigate phosphorus loading in the watershed of French and Keyser Ponds in Henniker, NH. Both ponds have an extended history of Cyanobacteria blooms that have lasted as long 3-4 months. The goal of this project is to address external and internal phosphorus loading to the ponds and develop a management plan that identify necessary steps to reduce loading from each of the subwatersheds.

This project will be funded by the New Hampshire Department of Environmental Services (NHDES) Clean Water State Revolving Fund through a loan to be awarded to the Town of Henniker. Contractor selection will be through a Qualification Based Selection (QBS) process.

II. PROJECT DESCRIPTION:

The goal of this project is to develop a watershed management plan following the U.S. EPA Nine-Element (a-i) Framework further detailed in the *Clean Water Act Section 319 Guidance for Watershed Management Plans*. The watershed management plan development will include the following tasks:

1) Quantify the mechanisms of phosphorus loading to the ponds by examining tributary and internal lake sources of total phosphorus and land use sources (direct runoff, septic systems, etc.) that may be contributing total phosphorus in direct runoff.
2) Identify land use strategies for mitigating loading from direct runoff to the ponds.
3) Update the 2011 TMDL report on French Pond with measured stream flow measurements to be used in calculating tributary phosphorus loading.
4) Incorporate detailed measurements of dissolved oxygen and total phosphorus in the water columns of each pond into lake models for calculating phosphorus loading dynamics.
5) Measure total phosphorus content in pond sediments to compare with measurements collected in 1985 to examine sediment storage and release of phosphorus.
6) Calculate a total phosphorus budget for each watershed.
7) Complete TMDL calculations for Keyser Pond.

It is expected that that the proposed work will involve a year-long study of phosphorus loading and cycling in French and Keyser Ponds. This will involve:

Monthly measurements of water chemistry throughout the water column for dissolved oxygen, temperature, transparency, and specific conductivity every meter. Water samples will be collected every two meters for total phosphorus, pH, turbidity, and chlorophyll-a measurements.

1. Monthly measurements of tributary streamflow, total phosphorus, specific conductivity, pH, and turbidity. Staff gauges will be installed on each tributary.
2. Collection of water chemistry data for 3 wet weather storm events and 3 dry weather storm events.
3. Collect/compile data on phosphorus loading by precipitation.

The long-term goal of this effort is to determine what will be necessary for an in-lake treatment that binds or inactivates the phosphorus present in pond sediments located within the anoxic zones of each pond. Prior to such a treatment, it will be critical that the majority of significant watershed sources of phosphorus to the ponds have been mitigated. Recommended mitigation of watershed sources will be achieved through the development of a watershed management plan that prioritizes phosphorus sources in each watershed for treatments with best management practices that will achieve the water quality goals established for each pond in the completed plan. The plan will meet the criteria for the USEPA Clean Water Act Section 319 Guidance for Watershed Management Plans.

III. SITE DESCRIPTION:

The watershed that includes both French and Keyser Ponds totals 250 hectares. Land cover is divided into the following categories:

Land cover	% Watershed Area
Open Water	9.0
Developed, Open Space	6.1
Developed, Low Intensity	2.9
Developed, Medium Intensity	1.1
Barren Land (Rock/Sand/Clay)	3.5
Deciduous Forest	34.3
Evergreen Forest	17.9
Mixed Forest	6.1
Shrub/Scrub	1.1
Pasture/Hay	9.9
Cultivated Crops	1.3
Woody Wetlands	6.7

The watershed has a history of intensive, agricultural land use including livestock (dairy and swine), an orchard, and a small area of cultivated crops. The areas adjacent to each pond include active seasonal campgrounds and cabins, and a mix of summer cottages and year round residences.

French Pond is located near the headwaters of the watershed and includes three tributary streams and a single outlet (Figure 1.). The water passing through the outlet of French Pond

eventually reaches the single inlet into Keyser Pond, roughly a mile away. Both ponds have a history of Cyanobacteria blooms that has included extended periods of public health advisories being issued from NHDES. During the summer months, both ponds have elevated total phosphorus concentrations in their hypolimnions. Data collected since the mid-1980s indicates elevated phosphorus concentrations in the inlet tributaries to French Pond. Although the tributary

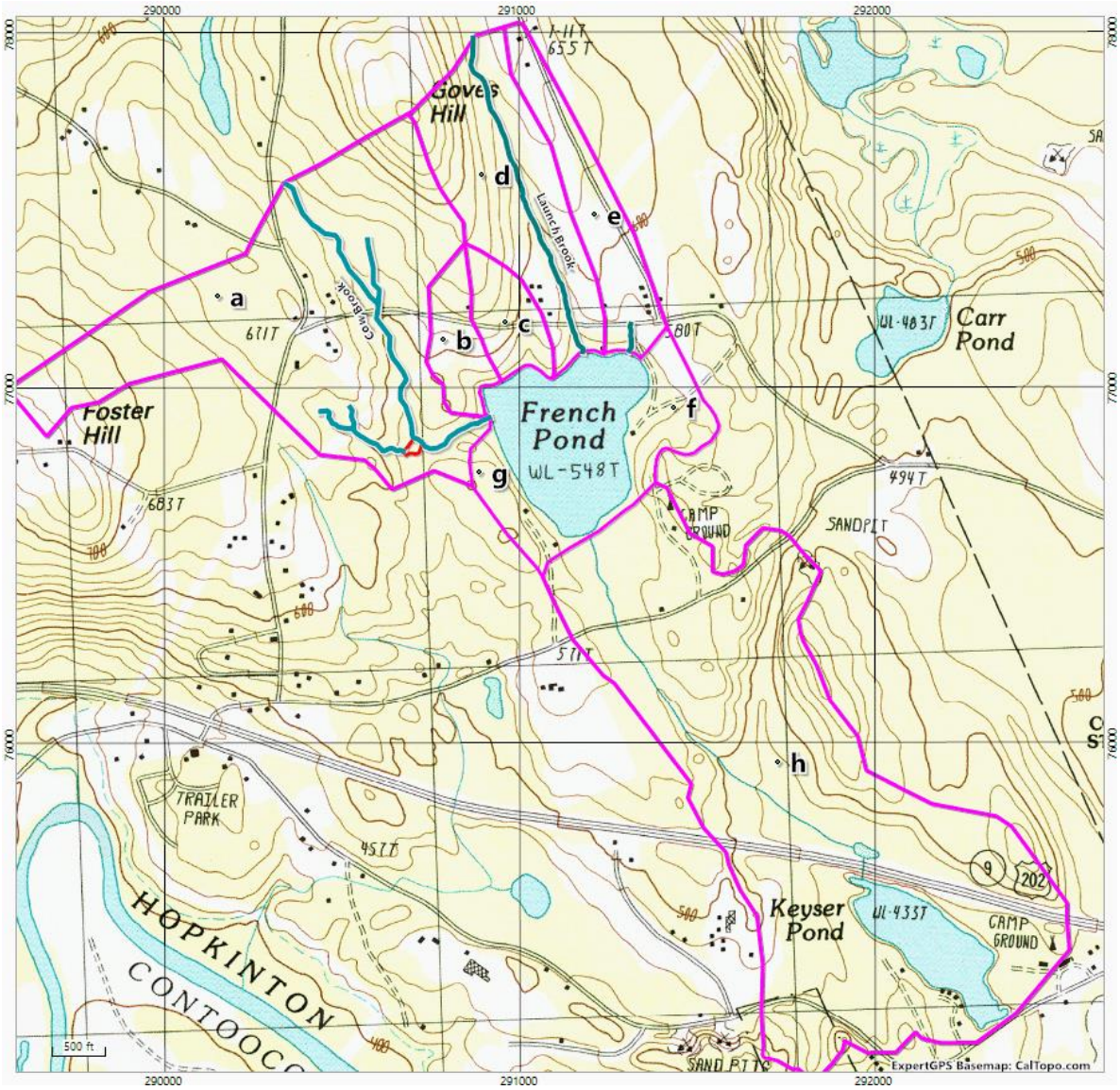

Figure 1. French and Keyser Pond Subwatersheds.

concentrations of total phosphorus have declined over the last 10 years, the occurrence of Cyanobacteria blooms have not, with Keyser Pond experiencing blooms that can last up to 3-4 months.

Keyser Pond experienced Cyanobacteria blooms and public health advisories in 1984, 1985, 1997, 1998, 2007, 2015, 2017, 2018, 2019, and 2020.

French Pond experienced Cyanobacteria blooms and public health advisories in 1984, 1985, 2006, 2007, 2008, 2009, 2012, 2015, 2016, and 2017.

The water quality of both ponds has been monitored by a variety of programs. French and Keyser Ponds were the focus of a 1986 Diagnostic Study by NHDES. French Pond has also been sampled annually as part of NHVLAP since 1988. The Henniker Conservation Commission has been collecting water quality data on both ponds since 2000. In 2011, a TMDL assessment was completed for French Pond. The trophic status for French Pond was assessed in 1979, 1997, and 2006. French Pond was classified as eutrophic in all three trophic assessments based on dissolved oxygen, Secchi disk transparency, aquatic vegetation, and chlorophyll-*a* concentrations. Water samples from French Pond are collected at the location of its deepest spot of just over 12 meters. It is common for French Pond to achieve anaerobic conditions at 4-5 meters and below during the summer months regardless of whether a Cyanobacteria bloom occurs. In addition, samples collected from 1986 onward, indicate elevated concentrations of total phosphorus in the hypolimnion, often over 100 µg/L.

There are three tributaries to French Pond which have historically had elevated concentrations of total phosphorus as high as 1250 µg/L (measured in 1985). The tributaries drain subwatersheds with a history of livestock operations. The livestock operations have been halted and the total phosphorus concentrations in the tributaries have substantially declined to less than 100 µg/L.

While French Pond has been studied extensively, Keyser Pond has not been studied to the same level of detail. Keyser Pond was included in the 1986 Diagnostic Study but is not sampled through NHVLAP so there is less available data. The trophic status of Keyser Pond was assessed in 1984 and 1997. The 1984 trophic survey classified Keyser Pond as eutrophic. Sampling occurred during an algal bloom that year and the report noted that Keyser Pond's Chlorophyll-*a* concentration (130.2 µg/L) was the highest in the state while Secchi disk transparency (0.25 meters) was the lowest in the state. The 1997 trophic status study classified Keyser Pond as borderline mesotrophic/eutrophic. Anaerobic conditions in the hypolimnion have also been observed. Keyser Pond is 6 meters deep and anoxic conditions rise up to a depth of 3 meters during summer months. Concurrent to the appearance of anaerobic conditions in the deeper waters, the concentration of total phosphorus increases with concentrations measured as high as 196 µg/L.

While historical monitoring data indicate a substantial decline in stream water concentrations of total phosphorus, the total phosphorus concentrations in the hypolimnion of both ponds during aerobic periods have not declined consistent with the occurrence of internal loading of phosphorus from pond sediments.

The proposed work builds upon two previous projects conducted by NHDES focusing on phosphorus loading to both ponds in 1985-86 available at:
http://www2.des.nh.gov/onestoppub/TrophicSurveys/1988_French_Keyser_Henniker_DFS.pdf

and a 2011 TMDL report regarding phosphorus loading for French Pond available at:
https://www.des.nh.gov//sites/g/files/ehbemt341/files/documents/2020-01/final-phosphorous-tmdl-report-french-pond.pdf. A TMDL report has not been completed for Keyser Pond.

French Pond was also included as a study waterbody from 1996-1999 for the *Development of Biocriteria for Vermont and New Hampshire Lakes Criteria Development for Phytoplankton and Macroinvertebrate Assemblages for Three Lake Classes Final Report – March 2003.* The Final Report is available at:
https://dec.vermont.gov/sites/dec/files/wsm/lakes/docs/lp_biocritfinalreport03.pdf

IV. SCOPE OF REQUIRED SERVICES:

Development of a watershed management plan that meets the criteria for the Clean Water Act Section 319 Guidance for Watershed Management Plans will include the following:

1) Compile historical water quality data, and determine what additional data is necessary to determine assimilative capacity (phosphorus) in the ponds and their respective watersheds
2) Establish in-pond water quality goals for phosphorus in French and Keyser Ponds.
3) Quantifying the sources and potential sources of phosphorus loading in the total watershed and each sub-watershed that will be accounted for and addressed. This will include calculating loading from each source and the recommended management practices. . The field work for this project will be done in collaboration with the Henniker Conservation Commission. This will include monthly collection of water samples (stream and pond) along with streamflow measurements.
4) Determination of estimated load reductions by implementing recommended management practices for each subwatershed.
5) NPS management measures (BMPs) will be recommended for addressing loading sources in each subwatershed focusing on critical areas where mitigation will provide the greatest phosphorus load reductions and progress toward achieving the in-pond water quality goals established for French and Keyser Ponds.
6) Expected costs of technical assistance required to implement the management plan recommendations along with potential funding sources.
7) A public outreach plan will be developed for working with landowners and stakeholders.
8) An implementation schedule will be created for implementing recommended management practices.
9) A detailed description of milestones for each stage of the management plan implementation.
10) The criteria to be used for assessing phosphorus loading reductions along with plans for updating the TMDL calculations for French Pond and calculating TMDL values for Keyser Pond and its tributary.
11) A detailed monitoring plan will be completed for measuring the effectiveness of the management plan using stream and pond water chemistry in subsequent years.

It is expected the consultant(s) will incorporate each of the components listed above into the final watershed management plan.

The consultant will work collaboratively with the Town of Henniker and the Henniker Conservation Commission and their partners to coordinate the development of the watershed management plan and to complete the selected tasks in Table 1.

Table 1. Proposed Tasks and Anticipated Roles for Consultant and Project Partners.

Proposed Consultant Tasks	Project Partner (Town of Henniker, Henniker Conservation Commission, NHDES, and shoreland owner associations) Roles
Objective 1: Site Specific Project Plan (SSPP)	
Deliverable 1*: Completed SSPP that will include compiling data necessary to determine assimilative capacity, watershed load, and to perform in-lake response modeling, and expected NPS load reduction management measures.*	
Task 1: Prepare and submit draft SSPP for watershed- based plan development work for review and comment.	Project partners review and comment. Send mark-up back to consultant.
Task 2: Address draft SSPP comments and submit final SSPP to NHDES.	Signatures on SSPP cover page
Objective 2: Compile historical water quality data, and determine what additional data is necessary to determine assimilative capacity (phosphorus) in the ponds and their respective watersheds.	
Deliverable 2: *Memo detailing the data and review of previous studies and the any additional data needed to complete the watershed-based plan for French and Keyser Ponds and the calculation of the current assimilative capacity for phosphorus.*	
Task 3: Compile historical water quality data and determine what is needed to determine phosphorus assimilative capacity.	Henniker Conservation Commission and NHDES to acquire historical water quality data and collect new data in collaboration with the Conservation Commission.
Task 4: Determine the historical and current total phosphorus and chlorophyll-*a* levels for French and Keyser Ponds	Provide historical water quality monitoring studies and reports and additional data that will be collected.
Task 5: Determine the assimilative capacity of French and Keyser Ponds for phosphorus and prepare summary of water quality criteria. Include examination of resulting chlorophyll-*a* and dissolved oxygen as it relates to existing impairments.	
Objective 3: Established water-quality goal for phosphorus in French and Keyser Pond.	
Deliverable 3*: Documentation and technical guidance for the process required for formally arriving at the water-quality goal for phosphorus and setting the goal through cooperation with project partners.*	
Task 6: Establish process for determining the water quality goal for phosphorus. Guide project partners to collect ice-out and sediment samples to inform this process and modeling efforts.	Establish Water Quality Goal Committee and work with consultant to develop current goal-setting process and final phosphorus goal. Collect in-lake and sediment samples.
Task 7: Facilitate meeting among project partners to formally adopt the water quality goals for French and Keyser Ponds.	Provide support for meeting planning, hosting, and facilitation.
Objective 4: Confirmed historical pollution sources, identification of current and future sources, and incorporation of internal phosphorus loading as a quantified pollution source.	
Deliverable 4*: Technical memo identifying historical, current (including in-lake internal loading) and future pollution source loads by land use type and source group by subwatershed for each parameter. Refined/revised pollution source loads for each subwatershed based upon site-specific knowledge using field, ground-truthing methods.*	
Task 8: Determine annual pollution source loads for the watershed using the ENSR-developed Lake Loading Response Model (LLRM) or other	

approved method as detailed in the SSPP. Use aerial photography and Landsat imagery to characterize the watershed (NOAA; C-CAP; NH GRANIT mapper, etc.). Submit summary memo of current annual pollution source load	
Task 9: Determine what additional data is needed to update the French Pond 2011 TMDL Report.	
Task 10: Conduct watershed pollutant source, land use and septic survey to identify and document potential pollution sources in the watershed for each pond and ground-truth the available imagery.	Work with consultant to acquire historical data and resources.
Task 11: Estimate in-lake phosphorus concentration and associated chlorophyll-*a* concentration, Secchi transparency and probability of algal blooms using in-lake response model(s) reference in the approved SSPP. Include determination of internal loading contribution	
Task 12: Complete watershed build-out analysis.	Town of Henniker and the Conservation Commission will assist with data acquisition.
Task 13: Run modeling scenarios to predict future pollutant loading, including natural background, build-out under current zoning, near-term development, future development, and others to meet water quality goals under those scenarios.	
Objective 5: Estimated pollution reductions and actions needed to maintain the water quality goal and future watershed conditions for French and Keyser Pond in Henniker, NH.	
Deliverable 5*: Technical memo describing and prioritizing the NPS management measures that will be used to achieve the load reduction estimated, as well as other watershed goals identified in the watershed-based plan, and identification of the critical areas where those measures will be needed to implement the plan.*	
Task 14: Determine pollutant load reductions needed in order to achieve water quality goals.	
Task 15: Identify locations needing BMPs and recommend technologies to achieve pollutant load reductions sufficient to achieve goals.	Work with project partners for consideration of recommended BMPs.
Task 16: Provide conceptual BMP designs and costs for each identified, watershed NPS pollutant reduction site.	Provide information relative to property ownership and potential for letters of commitment to have BMPs installed on private properties.
Task 17: Identify and evaluate in-lake treatment options relative to phosphorus inactivation/sequestration/filtration etc. that includes costs estimates needed to achieve water quality goal.	NHDES representatives will work with consultant relative to in-lake treatment policies and procedures within the agency.
Task 18: Estimate pollutant load reduction attributable to each site specific, watershed-based BMP and in-lake treatment method(s).	

Objective 6: A sustainable information/education strategy (ADA compliant) that will be used to enhance stakeholder understanding of Watershed Management Plan and encourage early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.	
Deliverable 6*: An education/outreach and social media plan that runs concurrently with development of the Watershed Management Plan.*	
Task 19: Work with Project Partners and NHDES Education/Outreach Coordinator to build education and outreach strategy for Watershed Management Plan.	
Objective 7: Publish the French and Keyser Pond Watershed Management Plan - Henniker, NH	
Deliverable 7*: An updated, revised, and fully, USEPA-compliant (a-i) watershed-based plan that incorporates watershed and in-lake nutrient sources and measures, costs, and resources to control them has been developed, submitted to, and subsequently approved by NHDES and the USEPA.*	
Task 20: Compile work completed in above tasks into a draft Watershed Management Plan and distribute to project partners for review and comment.	Project partners perform a timely review and provide comments by requested deadlines.
Task 21: Incorporate comments from project partners on *DRAFT* WMP, make revisions, and prepare for public meeting to present *the French and Keyser Pond Watershed Management Plan*	
Task 22: Participate in public meeting to present *DRAFT* Watershed Management Plan, incorporate public comments into *DRAFT*, and develop final WMP.	Logistical management and co-facilitation of meeting by project partners.
Task 23: Submit final Watershed Management Plan to Town of Henniker, the Henniker Conservation Commission, the French Pond Association, the Friends of Keyser Pond, and other interested members of the Henniker Community.	

V. PROJECT SCHEDULE:

Qualifications packages should include a schedule for conducting and completing the activities described in the Scope of Work with an anticipated start date during summer 2021.

VI. OTHER TERMS AND CONDITIONS OF SERVICE:

To participate in the project and receive payment, the selected firm will be required to enter into a contract which stipulates that the contractor is eligible to receive state funding, and certifies compliance with State rules related to CWSRF grant funded projects.

Insurance Requirements: The selected firm must submit proof of liability and workers compensation prior to execution of the contract including comprehensive public liability insurance coverage amounts of not less than $1,000,000 each occurrence and $2,000,000 general aggregate.

VII. EVALUATION PROCESS:

Qualifications will be evaluated and ranked according to the following criteria (weighted equally):

1. Specialized Experience of the Project Team (35%)
    a. Overall experience directly related to the successful completion of similar watershed planning projects include incorporation of EPA's Nine Elements ("a - i"), data analysis, monitoring, outreach, and working with diverse stakeholders to achieve project goals;
    b. Demonstrated ability to identify structural and non-structural BMPs and generate pollutant load analyses for BMPs;
    c. Demonstrated ability to complete work within the available budget and schedule (do NOT provide a cost estimate at this time); and
    d. Demonstrated ability to work with NHDES to develop Quality Assurance/SSPP documents.
2. Project Personnel (35%)
    a. Principal team members' roles and participation levels, availability, qualifications and experience.
3. Project Approach (30%)
    a. Demonstrated strong understanding of the scope of work, project schedule, and expected deliverables outlined in the RFQ.

The Town of Henniker reserves the right to interview, either in person or over the phone, candidates as part of the selection process.

The Town of Henniker and the Henniker Conservation Commission will evaluate all responses. Determination of qualifications and rank is at the sole discretion of the town of Henniker following the criteria and procedure detailed in this RFQ. Failure to submit all information called for may be sufficient grounds for disqualification.

VIII. SELECTION PROCESS:

Complete submittals will be evaluated in accordance with the criteria set forth under the "Evaluation Process." A scope and cost proposal will then be requested from the highest ranked qualified firm. Should an agreement not be reached, negotiations will proceed with the second ranked firm and so forth. The contract may be awarded to the firm that most closely satisfies the needs of the project and is deemed to be the most advantageous to the town of Henniker. The town of Henniker reserves the right to reject any and all proposals not conforming to the "Scope of Required Services" and "Other Terms and Conditions of Service". The contract shall be made only with responsible firms who possess the potential ability to perform successfully under the terms and conditions of the proposed procurement.

This RFQ does not commit the Town of Henniker to award a contract or to pay any costs incurred during the preparation of the applicant's RFQ response. The Town of Henniker reserves the right to reject any or all responses, or portions thereof, to negotiate separately

with any source whatsoever, or to cancel this request at any time for any reason allowable under applicable rules and laws.

IX. REQUIREMENTS FOR STATEMENTS OF QUALIFICATION:

1. Name and address of firm; name, title, phone and email for contact person.
2. Description of other projects designed by this firm similar to this project.
3. Contact information for 2 – 3 references.
4. A brief description of the firm's approach to planning, designing and implementing the project, including expectations of client.
5. Principal team members' roles, availability, qualifications and experience

Note: *Do NOT provide a cost estimate, fee schedule, or any type of price proposal at this time.*

You are also invited to include a maximum of one page of information not covered above, which you feel may be useful.

Electronic copies of your Statement of Qualification should be emailed in PDF format and received no later than Friday June 11, 2021 to Wendy Baker at: wendy.baker@henniker.org or mailed to Wendy Baker, Henniker Town Hall, 18 Depot Hill Rd., Henniker, NH 03242. If mailed, the Statement of Qualification must be received by June 11, 2021.

X. Questions:

Questions concerning this RFQ must be submitted via e-mail to Mark Mitch mmitch@nec.edu. Do not contact by telephone. Any questions about this RFQ raised by an individual/firm will be answered in a summary digest. The summary digest will be provided to those who request to be put on an e-mail list to receive the digest. The cut-off date for questions and requests to be put on the e-mail list to receive the summary of questions and answers is **June 8, 2021**. Please e-mail Mark Mitch at: mmitch@nec.edu to ask a question or to be put on the e-mail list to receive the summary digest. The summary digest will be provided via e-mail by June 15, 2021 to all consultants on the response list.