STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

GERALD D. REID
COMMISSIONER

September 16, 2021

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: Comments on the Draft Licensing Application for the Lowell Tannery Hydroelectric Project (FERC No. 4202)

Dear Secretary Bose:

The Maine Department of Environmental Protection (Department or DEP) reviewed a Pre-Application Document (PAD), submitted on September 26, 2018, a Water Quality Study Plan dated June 2019, and the 2019 Initial Study Report (ISR) issued March 26, 2020. The Department also attended a Initial Study Report Meeting on March 27, 2020, organized by Kruger Energy, KEI (USA) Power Management Inc. (Applicant), for the Lowell Tannery Hydroelectric Project (LTHP, Project) (FERC No. 4202) that detailed the results of those water quality studies and discussed additional studies for the (then) upcoming field season. Department staff submitted comments to the ISR on April 17, 2020 and have reviewed the Draft License Application (DLA), submitted for review on June 18, 2021.

As previously noted, the proposed relicensing of the LTHP is subject to water quality certification provisions of Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act). By Executive Order of the Governor of the State of Maine, the Department is the certifying agency for projects located wholly or partially in organized towns and cities, and as such has jurisdiction over the Project.

Background

Water quality studies requested by the Department to be conducted pursuant to the Project study plan included studies intended to demonstrate whether water quality in the vicinity of the Project meets Maine's water quality standards for Class A waters (upstream of the Project) and Class AA waters (downstream of the project dam) [1] and to assess whether current instream flow releases and project operations are affecting attainment of classification standards.

The existing LTHP consists of a 230-foot-long, 27-foot-high concrete gravity dam with a crest elevation of approximately 184.0 feet[2] topped with 3.5-foot-high flashboards (for a total of 187.5 feet normal pond elevation), with a principal spillway of 30 feet and an auxiliary spillway of 89

[1] 38 M.R.S. Section 467(7)(F)(6)(a)
[2] Elevations are provided in feet above mean sea level.

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

website: www.maine.gov/dep

feet, a seven-foot-wide log sluice and a 10-foot-wide tainter gate. The dam impounds a reservoir with a surface area of approximately 68.5 acres at a normal pond elevation. The dam contains a 3-foot-wide Denil fish passage facility and a dedicated downstream fish bypass pipe. A powerhouse integral to the dam contains a single turbine-generator unit with a total generating capacity of 1 MW and an average annual generation of approximately 4,095 MWh. The Lowell Tannery Project operates in a run of river mode where upstream water flowing into the project impoundment approximately equals water flowing downstream from the project.

The Department understands that there are no proposed changes in facilities or operations of the LTHP at this time.

The Department has reviewed the DLA materials and has the following comments:

Water Quality Studies

Impoundment Trophic State Study – The purpose of trophic state study is to determine, if the Project impoundment has a steady or decreasing trophic state subject only to natural fluctuations and is free of algal blooms that impair the impoundment use or enjoyment. The Department requested the Impoundment Trophic State Study in their March 2019 PAD comments.

This study was conducted by the Applicant between June and October 2019, in accordance with the Department's "Temperature and Dissolved Oxygen Study" protocol under "Rivers and Streams" in the DEP SAMPING PROTOCOL FOR HYDROPOWER STUDIES (June 2018).

The March 2020 ISR and DLA indicate some impairments to impoundment water quality. Nutrient concentration exceeding those determined by the Department to be acceptable can cause negative environmental impacts to surface waters, such as algal blooms, low dissolved oxygen concentrations, excessive growths of filamentous algae or bacteria, generation of cyanotoxins or affecting the resident biological community. Project study results indicated nutrient concentrations (phosphorus and chlorophyll-a) in the Lowell Tannery impoundment exceed generally acceptable concentrations for Class A waters. Secchi disk transparency measurements ranged from 1.9-2.9 meters; measurements less than two meters can indicate algal growth, especially in the presence of excessive nutrients. A single Secchi disk measurement, collected on October 2, 2019, was less than the two-meter threshold demonstrating attainment of Class AA/A water quality standards, however color values are high (85-100 PCU) in the Passadumkeag River at this location, which prevents conclusions being drawn from the Secchi disk transparency measurements.

DO concentrations in the impoundment failed to attain Maine Water Quality Standards, specifically the minimum criteria of 7 ppm, on 4 of 10 sampling dates (40% of the sampling period). As summarized below the Applicant conducted an additional DO monitoring study in 2020. The Department provides its evaluation of the DO data collected in 2019 and 2020 in the comment section below.

Downstream Temperature and Dissolved Oxygen Study – Temperature and DO were monitored downstream of the Lowell Tannery Dam to demonstrate whether the Project meets Maine's DO numeric criteria downstream of the Project.

This study was conducted by the Applicant between June and October 2019, in accordance with the Department's "Temperature and Dissolved Oxygen Study" protocol under "Rivers and Streams" in the DEP SAMPING PROTOCOL FOR HYDROPOWER STUDIES (June 2018). This study was conducted with Maine's Class AA/A minimum dissolved oxygen criteria of 7 parts per million and 75% saturation.

The March 2020 ISR and DLA indicated some impairment to tailwater DO. DO results ranged from 6.2 mg/L to 10 mg/L, with percent saturation ranging between 70.9% and 104.5%. Dissolved oxygen concentrations in the tailwater failed to attain Maine Water Quality Standards, specifically the minimum criteria of 7 ppm. The Study notes that DO concentrations appear to track the concentrations measured in the impoundment during generation, and generally increase when generation stops.

As discussed above, the results of both studies conducted in 2019 indicated that DO did not meet the 7 parts per million (PPM) concentration for Class A criteria in the impoundment or the 7 PPM concentration for Class AA criteria in the tailwater of the Project. MDEP stated these water quality deficiencies to the Applicant and to FERC in their April 2020 comments to the ISR. Further, the Department stated that, to aid in determining whether the cause of low DO is upstream or arises in the impoundment, the Applicant could sample DO above, within, and below the impoundment twice each day (before 8:00am and again in mid-afternoon at each), following the DEP SAMPING PROTOCOL FOR HYDROPOWER STUDIES (June 2018). The Applicant and its consultant, in consultation with MDEP on May 26, 2020, coordinated an additional study on DO during the 2020 field season.

Comments to Dissolved Oxygen Studies

The Applicant monitored DO and water temperature throughout the Lowell Tannery project area in July and August 2020 to evaluate whether upstream waters (i.e., impounded waters or inflowing waters to the impoundment) may have contributed to the low DO values in the impoundment and in the tailwater that were observed in 2019. KEI (USA) installed Onset Hobo U-26 dataloggers in the Passadumkeag River at four locations, which were approved by the MDEP, and recorded hourly DO and water temperature data between July 15 and August 24, 2020.

- Site 1 Upstream - approximately 3.8 river miles upstream from the dam at the transitional point between river and impounded habitat;

- Site 2 Impoundment- at the deepest location within the impoundment, where 2019 water quality samples were collected (approximately 250 feet upstream of dam, water depth approximately 20 feet);

- Site 3 Tailwater – in the tailwater directly downstream of the dam; and

• Site 4 Downstream - one mile downstream of the dam.

Figure 4.12 and Table 10 of the DLA demonstrate that waters upstream of the Project impoundment did have DO concentrations and percent saturation levels below the Class A/AA standards. The DO concentrations at the deep spot in the impoundment were consistently between 6.0 mg/L and 7.5 mg/L and 60 percent to 90 percent saturation and were below the standard. In the tailwater and downstream of the dam, the DO concentration and percent saturation were above the Class AA standards throughout the monitoring period. The Applicant provided discussions of the data on p. 4-35 and 4-36 of the DLA. This reporting only shows the max, min and average values for DO concentration, % saturation and water temperature from the 2020 DO Study. The Department requests that the Applicant submit the raw data in excel format from the 2020 DO studies for analysis.

The summary of the DO data presented in the DLA appears to show that DO numeric criteria for Class A waters was not met downstream of the Project during the sampling in 2019, but was met during the sampling in 2020. The data additionally shows that DO numeric criteria was not met in the impoundment in either 2019 or 2020, however, the 2020 sampling demonstrated that the 7 ppm numeric criteria for Class A waters was also not met at the sampling station upstream of the impoundment.

Based on the 2019 and 2020 DO data provided in the DLA, the Department is able to conclude that inflowing waters to the impoundment contributed to the low DO values in the impoundment and in the tailwater that were observed in 2019. Therefore, the Department concludes that sufficient data has been collected related to DO at the Project and, pending the submission of the 2020 DO and temperature data set, the Department will be able to make a determination of whether the Project causes of contributes to the failure of the water body to meet the Class A standard for DO.

Habitat Studies

Impoundment Aquatic Habitat Study - For water quality certification the Applicant must demonstrate that the Lowell Tannery impoundment, as a Class A water, is suitable as habitat for fish and other aquatic life; further, the habitat must be characterized as natural.

In its March 2019 PAD comments for the Lowell Tannery Project, the Department requested the Impoundment Aquatic Habitat Study, or in lieu of conducting the requested study, the Applicant was requested to submit three years of water level and flow data and impoundment bathymetry data to demonstrate run-of-river operations (ROR), wherein inflow is equal to outflow and impoundment water level fluctuations are limited to one foot.

These data were not reported or submitted in the March 2020 ISR, and the Department reiterated in their April 2020 ISR comments that this data must be submitted in order for the Department to make a determination concerning ROR operations and assess habitat in the Project impoundment. The flow and water level data were also not reported in the DLA. The Applicant presented a figure showing the bathymetry of the Project impoundment, demonstrating that this

data was collected, but did not report the raw data collected during 2020. Bathymetric data is critical to the evaluation of impoundment littoral habitat and the Department requests that the raw bathymetric data be submitted (see below).

In 2014 KEI (Maine)'s WQC and FERC license for the Lowell Tannery Hydroelectric Project were amended to eliminate store and release drawdowns and establish ROR operations, with drawdowns limited to specified maintenance or emergency operations. Therefore, the Lowell Tannery Project is reported to be a ROR facility wherein inflow is generally equal to outflow, and the water level elevation does not fluctuate more than one foot from its normal full pond elevation of 187.5 feet. Under a ROR operating regime, flows are not managed for the purpose of hydropower generation. As a ROR Project, impoundment water levels at the Lowell Tannery Project must be stable and as naturally occur, generally subject only to natural variations related to precipitation events, and Project operations do not cause the water level to fluctuate.

Therefore, at least 3/4ths of the cross-sectional area of the riverine impoundment is expected to be maintained and the impoundment is expected to be suitable as habitat for fish and other aquatic life.

Aquatic Habitat Cross-Section Flow Study - The Class AA waters downstream of the Project Dam must be found suitable as habitat for fish and other aquatic life and must be free-flowing and natural. As discussed above, the Project is believed to operate in ROR mode, where inflow is generally equal to outflow. As such, all water flowing into the Project impoundment is discharged to the Class AA river below the dam, which flows freely for approximately 13 miles to its confluence with the Penobscot River. The powerhouse is aligned with the dam with no bypass reach and operates in a band of flows between 90 cfs and 905 cfs. All flows are discharged through the powerhouse, through the fishway, or over the dam as spill directly downstream to the Passadumkeag River.

In its March 2019 PAD comments, the Department requested the Applicant conduct an Aquatic Habitat Cross-Section Flow Study to demonstrate attainment of habitat and aquatic life criteria, however the study was not conducted. As stated above the flow and water level data were not reported in the ISR or the DLA.

Therefore, the Department must analyze the Project based on operations. As discussed above, ROR operations, by definition, require inflow to be equal to outflow. With all inflow delivered to the outlet stream and with no appreciable bypass reach, the Department concludes that 3/4ths of the cross-sectional area of the Passadumkeag River below the Project Dam remains wetted at all times, and is expected to provide sufficient aquatic habitat to meet the State's aquatic life and habitat standards. Further, when reviewed with the findings of the Benthic Macroinvertebrate Study (see below) the Department believes that ROR operations do not negatively affect the quality of aquatic habitat downstream of the Lowell Tannery Dam and that the habitat found there can be characterized as natural because it met Class A habitat and life criteria.

Comments to Habitat Studies

The Applicant asserts in the DLA that the Project is ROR, however, the Applicant has yet to demonstrate that the LTHP operates as ROR and has not submitted the requested inflow/outflow and water level data. In Figure 4 of the DLA, the Applicant includes a map of the impoundment bathymetry, however, no detailed bathymetry data was presented in the DLA and no data has been submitted to the Department at this time. MDEP requests that the Applicant submit the raw bathymetry data collected in 2020 in excel format for analysis.

While ROR conditions are not demonstrated by the Applicant, based on the licensed operating regime, the Department believes that at least 3/4ths of the littoral habitat remains wetted during normal Project operations and if so, in accordance with the Department's water level and flow policy, the Project meets the aquatic life and habitat standard. The Applicant can confirm the Department's understanding by submission of the requested bathymetry data and three years of water level and flow data.

Based on the information reviewed by the Department, and also based on its professional judgement, the Department believes that the outlet stream habitat meets Class AA water quality standards. Here, the Department again requests that the Applicant demonstrate the extent of habitat for fish and other aquatic life in the impoundment by submitting three years of impoundment elevation and inflow/outflow data.

Benthic Macroinvertebrate Monitoring – Assessment of the benthic macroinvertebrate community is critical to determining whether Project operations affect attainment of habitat and aquatic life criteria in the river below the Lowell Tannery dam.

KEI conducted a benthic macroinvertebrate study between August 6 and September 13, 2019 in the Class AA waters immediately downstream of the Lowell Tannery dam, in accordance with the Department's "Methods for Biological Sampling and Analysis of Maine's Inland Waters" (Davies and Tsomides 2014). KEI reports that three replicate rock bags were installed at one sample site in representative aquatic habitat located approximately 490 feet downstream of the dam on August 6 and were retrieved on September 13[3]. Habitat measurements, including substrate type, depth, and temperature, were collected at the time of sample retrieval.

The Applicant's consultant reports that the community structure and function downstream of the Lowell Tannery dam is generally healthy with evidence of natural biological enrichment that does not show signs of excessive stress as a result of Project operations. The Department analyzed the samples using its linear discriminant model and professional judgement to determine that while the model predicted attainment of Class B aquatic life standards, the final determination is Class A[4], based on lake outlet effect, where the impoundment discharge acts like a natural lake outlet.

---

[3] The Applicant's contractor was unable to retrieve the samplers within the 28 day =/- 4 day window due to high river flows.

[4] The aquatic life criteria for classes A and AA are the same. Therefore, a determination that the waters meet Class A aquatic habitat and life criteria also demonstrate attainment of Class AA. Email from the Department's Biological Monitoring Program Manager, dated March 27, 2020.

Based on the results of the BMI study, the Department concludes that KEI (Maine) has provided sufficient information to demonstrate that the benthic macroinvertebrate community in the Passadumkeag River in the vicinity of the LTHP meets Class A and Class AA aquatic life standards under current and proposed flow conditions.

Thank you for the opportunity to comment on the DLA for the Lowell Tannery Project. Please direct any questions regarding these comments to Christopher.Sferra@maine.gov (207) 446 - 1619.

Sincerely,

Christopher O. Sferra
Project Manager
Maine Department of Environmental Protection

cc: Lewis Loon, KEI (Maine) LLC
Sherri Loon, KEI (Maine) LLC
Andy Qua, Kleinschmidt Associates