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October 17, 2024

NYSDEC
Regional Permit Administrator
21 South Putt Corners Rd.
New Paltz, NY 12561-1620

RE: Request for an Emergency Authorization to install a siphon drain system to maintain low water levels at Mohonk Preserve's Duck Pond

Dear Ms. O'Malley:

In 2018 Mohonk Preserve's Duck Pond experienced a rapid drop in water levels. Upon investigation it was found that a low-level drain valve froze and broke off allowing the water to free flow through the drain.

Duck Pond was created via a manmade dam and was not included on DEC's list of registered dams. Subsequently in 2018 Mohonk Preserve proceeded with registering the dam. The dam is now registered as a Class A (low hazard) dam: NYSDEC Dam Number 193-5962 (see attached Mohonk Preserve Duck Pond Dam Location Map).

The Duck Pond Dam is located within Mohonk Preserve (Figure 1-1), was constructed circa 1908, with a spillway of more recent construction, possibly in the 1950s. The dam is constructed of stacked stone and earthen fill with a historic carriage road crossing it. The spillway is concrete and consists of three openings that pass flow over the dam.

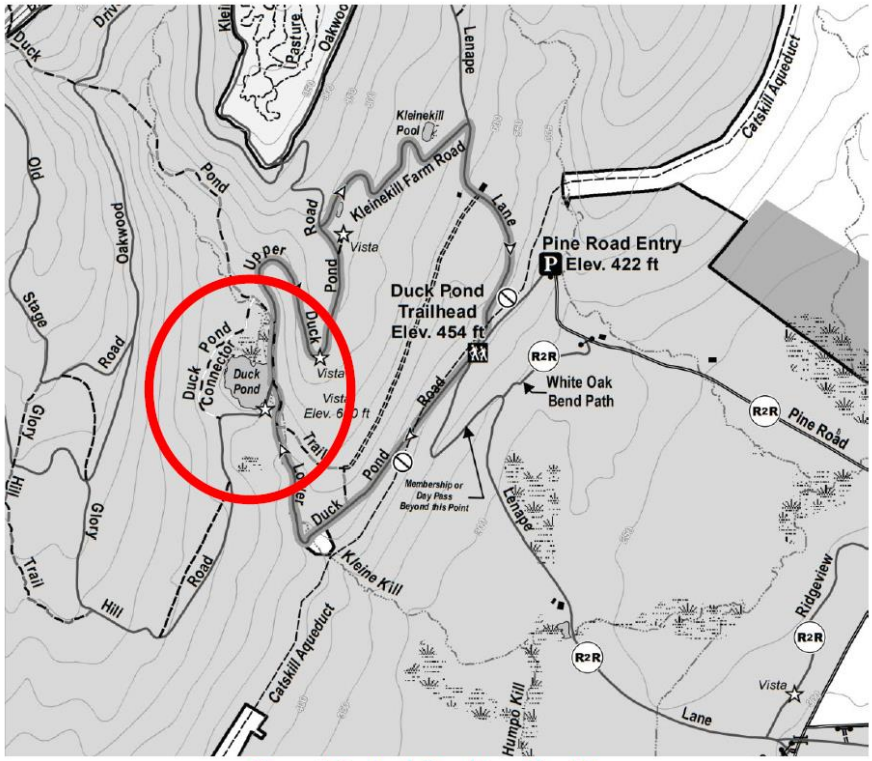

Figure 1-1 Duck Pond Location Map

In 2018 upon the discovery of the rapid loss of water, Mohonk Preserve contacted DEC's Division of Water Bureau of Flood Protection and Dam Safety (Warren Shaw) to provide guidance on how to proceed with rectifying the situation. Mr. Shaw visited the site in November 2018 to perform a visual dam safety inspection and assessment of the dam, along with all appurtenant structures, and conduct a dam break assessment, per the NYSDEC Guidelines, to confirm the hazard classification.

Mr. Shaw's inspection revealed several deficiencies, including tree growth on the dam, a nonfunctional low-level outlet, and the poor condition of the laid stone on the downstream face of the dam.

Since the inspection the Preserve has taken the following actions:

- Removed all large diameter vegetation from the dam.
- Installed pedestrian safety barriers.
- Constructed fencing at the inlet of the spillway to mitigate beavers from blocking flow.
- Conducted regular inspections.
- Employed SLR Engineering to conduct further inspections, analyses, and recommendations.

In 2022 SLR Engineering completed a multi-year study (see attached: DUCK POND DAM FEASIBILITY STUDY) with input from Preserve staff, volunteer committees, and board members. SLR's detailed inspections revealed additional deficiencies over the inspection completed by DEC in 2018.

Following is a summary of deficiencies at Duck Pond Dam, broken down by dam component.

3.3.1 EARTH EMBANKMENT DAM (MAIN DAM)

- Trees and shrubs growing below toe of downstream face of dam.
- Downstream face of embankment has many dislodged or missing stones, which have created voids or weak points in the dam structure.
- Significant leakage along right half of embankment from low-level outlet chamber to right abutment.
- Dam crest elevation is uneven.
- Evidence of overtopping (most recently in April 2022).

3.3.2 CLOSURE DIKE

- Trees and shrubs growing on closure dike.
- Evidence of overtopping (most recently in April 2022).

3.3.3 SPILLWAY

- Spillway inadequately sized to pass spillway design flood; hydraulic modeling indicates that the dam is overtopped during the 100-year flood event.
- Concrete and stone masonry has large cracks, spalling, and deterioration of mortar.
- Spillway slipped or tilted in downstream direction.
- Large transverse cracks present within spillway conduits.
- Erosion at toe due to the spillway flows dropping 15 feet vertically as it discharges through the dam.

3.3.4 LOW-LEVEL OUTLET

- Low-level outlets are not functional and are charged with water within the embankment structure.

The conclusion of the feasibility study offered three options: 1. Rehabilitation of duck pond dam, 2. Removal of duck pond dam with restoration of free-flowing stream, and 3. Removal of duck pond dam with beaver analog structures. The Preserve chose to move forward with option 3; Removal of duck pond dam with beaver analog structures to restore the Kleine Kill Stream corridor with an upland wet meadow.

The Preserve is currently seeking DEC Water Quality Improvement Project (WQIP) program funding to complete the engineering designs to remove the dam, restore the stream corridor, and reconfigure the historic carriage road network around the dam.

Since 2018 the lower-level drain outlet has continued to flow, and the pond's water levels have ebbed and flowed in relationship to rainfall. In 2022 the area received significant rain fall which led to an overtopping of the dam and embankment, further degradation of the downstream side of the spillway, an expansion of a linear crack within the spillway (forcing water into the toe wall), and significant damage to the historic carriage road network below the dam (see attached Duck Pond 2018 and 2024 water levels).

Throughout the summer and fall of 2024 precipitation has been at a minimum reducing the water levels and keeping it below the spillway. Water levels remained low enough to allow for additional inspections of the linear crack within the spillway. Visual inspections completed by Mohonk staff on August 13, 2024, noted that the crack within in the spilly seemed to be expanding. SLR Engineering was immediately contacted to complete a structural inspection. The inspection was completed on August 20. SLR Engineering noted that the crack has expanded (see attached Duck Pond Dam - Inspection 2024-08-20):

> The crack is roughly 4.5" wide and of indeterminate depth and has propagated through the entire concrete and masonry spillway section (base, piers/columns, and top slab). Seeping flows were observed to be flowing out from near the right (southwest) side at the toe of the dam, between about 10 and 20 feet offset from the primary spillway section. No turbidity was observed in the discharging seepage.
>
> On the downstream face of the dam, the spillway section has been undermined to the point of creating a hazardous condition. A large void has developed underneath the center and left (northeast) spillway conduits that is up to about 3 feet deep, with slightly less severe undermining of the right (southwest) conduit, leaving a significant portion of the spillway structure unsupported on the downstream side (Photo 2). The remaining dry masonry elements under the spillway section are loose. Much of the embankment downstream of the spillway had previously been eroded, and the concrete spillway structure is slumping in the downstream direction.

SLR Engineering noted the conditions of the spillway are becoming unsafe and recommended "closing the roadway over the dam to all vehicle traffic and that the impoundment should be drawn down to relieve the hydrostatic pressure on the dam as soon as is practical." Vehicle restrictions were enacted immediately.

Mohonk Preserve proceeded to request SLR Engineering to provide design specifications for the construction of the siphoning system to maintain lower water levels in the pond (see attached Duck Pond Drawdown Siphon). The siphon designs were received on September 27 and the Preserve began the planning process to begin the drawdown for the spring of 2025 with the ecological purpose of maintaining nesting habitats for the various amphibians throughout the winter.

During the first week of October 2024 the Preserve was receiving reports that the pond's water levels dropped back down to their lowest levels not seen since 2018. A visual inspection of the pond completed on October 13 confirmed the low water levels and that water was still flowing through the lower-level outlet drain. On October 7 another inspection reported that that the lower-level outlet drain's outflow was reduced to a trickle (see attached Mohonk Preserve Duck Pond - Water levels 10.03.24 to 10.15.24). Mohonk Preserve reported this to SLR Engineering who came out on October 10 to inspect. Correspondence regarding the current situation was also made to Warren Shaw (DEC Division of Water Bureau of Flood Protection and Dam Safety) after SLR's inspection.

During SLR Engineering's October 10 inspection it was noted that the lower-level outlet drain's outflow ceased to flow, and the pond began to fill once more. On October 15 another visual inspection was completed by Mohonk staff after receiving approximately 0.64" of rain over the three-day weekend. It was

observed on October 15 that the water levels in the pond rose approximately 5 feet. On October 16 Mohonk staff noted that the water levels have continued to rise, and the pond level is approximately 4 feet from entering the spillway.

On October 15 after speaking with Waren Shaw it was Bureau of Flood Protection and Dam Safety's recommendation to seek an emergency authorization from Region 3 to lower the water levels :

> "the pond should be lowered immediately to reduce the pressure on the dam and more importantly to prevent any further flow from going through/over the spillway until remedial plans to fix the dam or the removal of the dam can be completed. Any further deterioration of the spillway could potentially lead to a dam breach and an uncontrolled release of the pond. Based on the low-level drain not being able to keep the pond impoundment at a lower level, either due to inadequate capacity or just not being able to provide a consistent flow (siltation, clogging, etc.), the installation of the siphons should be done as soon as possible, if not immediately." (Email: DEC ID#: 193-5962 Mohonk Preserve - Duck Pond Dam (Ulster County))

With the 6" low-level outlet drains no longer flowing, Mohonk Preserve is concerned that the next 0.5-1.0" rainfall could raise the water levels to the point that it will begin to enter the compromised spillway. Upon entering, the water will proceed into the 4" linear crack, prior to exiting the spillway, diverting water down towards the toe and further degrading the downward support for the spillway. A heavy rainfall could lead to the spillway collapsing, failure of the historic carriage crossing the dam, washout the carriage roads below the dam, and cause potential harm to those who utilize the carriage road network while recreating on the land.

SLR Engineering is in the process of calculating the flow rates for a dual siphon system. The intention is to place a water level gage in the pond to monitor the pond's water level. The water level range for maintaining the habitat needed for the amphibians is another critical we are seeking guidance on. The Preserve will monitor and open or close the valves based on SLR's calculations to maintain a certain level. An actively managed siphon system will be the interim management plan until funding and appropriate permits are obtained to restore the Klien Kill Stream corridor as an upland wet meadow with a free-flowing stream.

With the concerns noted above, Mohonk Preserve is recognizing that it would not be prudent to wait to spring of 2025 to apply for a permit to construct the siphon system and is requesting an emergency authorization to construct the siphon system as soon as possible.

Sincerely,

Chuck Reid
Director of Land Stewardship
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CC: Kevin Case, Mohonk Preserve President/CEO
Paloma Krakower, Mohonk Preserve Director of Conservation & Community Education
Warren Shaw, DEC Bureau of Flood Protection and Dam Safety
Kelly Turturro, DEC Regional Director, Region 3
Matthew Trueheart, SLR Engineering
Mark Carabetta, SLR Engineering