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2024 REGULAR INSPECTION REPORT

for

SENECA LAKE DAM (NJDEP File No. 22-183)

Sparta Township
Sussex County, New Jersey

Owner

Seneca Lake Club, Inc.
P.O. Box 505
Sparta, NJ 07871

Prepared by:

GZA GeoEnvironmental, Inc.

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**SENECA LAKE DAM
VISUAL INSPECTION CHECKLIST**

NJ INSPECTION YEAR: 2024

TYPE OF INSPECTION: Regular

Dam Name: Seneca Lake Dam
Dam File Number: 22-183
Location: Sparta Township, Sussex County
Owner: Seneca Lake Club, Inc.
Operator: Seneca Lake Club, Inc.
Date of Inspection: October 17, 2024

Reservoir Information:

Normal Reservoir Elevation (ft.)	858.1 (See note below.)
Reservoir Elevation at time of Inspection (ft.)	857.9± (Flow was measured about 2 inches below spillway crest.)

Note: The Normal Reservoir Elevation is at the spillway crest elevation which is based on the October 2004 Record Drawings for the Re-Construction of Seneca Lake Dam prepared by Civil Dynamics. The drawings reference the elevation datum as USGS, or NGVD29.

Weather Conditions (including recent rainfall)

Low-40s and sunny. Light rainfall occurred on October 14, 2024.

INSPECTION PERSONNEL

New Jersey Licensed Professional Engineer(s):

Name	Affiliation	Area of Expertise
Jess Bergmann, PE	GZA GeoEnvironmental, Inc.	Dam Engineering

Non-Licensed Technical Expert(s) and Advisor(s):

Name	Affiliation	Area of Expertise
None		

New Jersey State Representative(s):

Name	Affiliation	Area of Expertise
None		

Dam Owner Representative(s):

Name	Affiliation	Area of Expertise
Dave Mazzella	President, Seneca Lake Club, Inc.	General Maintenance

Others:

Name	Affiliation	Area of Expertise
None		

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

GENERAL INFORMATION

Name of Dam: Seneca Lake Dam	
Federal I.D. Number: NJ00768	NJ Dam Number: 22-183
River Basin: Musconetcong River (above Trout Brook)	
Town: Sparta Township	County: Sussex
Block: 3001	Lots: 112, 113, 114, 118, 125, 126, 127
Nearest Downstream	
City or Town: Sparta Township	
Stream Name: Unnamed	
Tributary of: Lubbers Run	
Latitude: N 40° 59' 58.5"	Longitude: W 74° 38' 52.8"
Type of Dam: Earthfill	
Purpose of Dam: Recreation	
Hazard Category: Class II, Significant	Drainage Area (sq.miles): 1.8
Height (ft): 14 (maximum at dam)	Length (ft): 360 (Dam) 140 (Dike)
Normal Surface (ac): 24	Normal Capacity (af): 99 @ El. 858.1
Maximum Capacity (af): 208 @ El. 861.1	Spillway Capacity (cfs): 1,286 @ El. 861.1

Note: Portions of General Information are based on previous inspection reports, Civil Dynamics' October 24, 2003 letter to the Bureau of Dam Safety regarding modifications to the design of the dam and the October 2004 Record Drawings for the Re-Construction of Seneca Lake Dam prepared by Civil Dynamics.

HISTORY

Date Constructed: Unknown	Date(s) Reconstructed: 2004-2005
Designed by: Unknown	Reconstruction Designed by: Civil Dynamics, Inc.
Constructed by: Unknown	Reconstructed by: Ritacco Construction, Inc.
Owner: Seneca Lake Club, Inc.	
Owner's Address: Seneca Lake Club, Inc. P.O. Box 505 Sparta, NJ 07871	
Owner / Operator present during inspection:	Yes <u> X </u> No <u> </u>

PREVIOUS INSPECTION

Date of Last Inspection: <u> Oct. 28, 2022 </u>	Date of Last Regular Inspection: <u> Oct. 28, 2022 </u>
Date of Last Phase I Inspection: <u> June 1981 </u>	Date of Last Formal Inspection: <u> 2005 </u>

Dam was rehabilitated in 2004-

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

EMERGENCY ACTION PLAN (Required for all Class I and Class II dams)

Date of Approved Plan:	July 26, 2012
Date of Plan Revision:	January 1, 2023
Is the notification flowchart complete and current?	No, Owner reported that updates will be completed in early 2025.
Is inundation mapping or a description included?	Yes
Are emergency materials and equipment identified?	Yes
When was the plan last tested?	Not tested.

DOWNSTREAM HAZARD CLASSIFICATION

Present Hazard Classification:	Class II, Significant
Changes in downstream Land Use and Habitation:	None apparent based on site visit and a previous review of Google Earth historical aerial imagery.
Is the present classification appropriate?	Yes

OPERATION AND MAINTENANCE

Date of Operation and Maintenance Plan:	2009
Are instructions adequate?	Yes
Do operating personnel follow instructions?	Unknown, but the Club keeps the dam generally well maintained.
What are the operating personnel capabilities?	General maintenance and low level outlet operation.

EXAMINATION OF EMBANKMENT DAMS AND DIKES

MAIN DAM

DESCRIPTION OF STRUCTURE

Embankment Material:	Earthfill
Cutoff Type:	None
Impervious Core:	None
Internal Drainage system:	None
Movement (Horizontal and Vertical Alignment):	No signs of movement were observed or apparent on either side of the spillway.
Junctions with Abutments or Embankments:	Appeared stable at contacts with the abutments and toe areas. No significant erosion was observed.
Miscellaneous:	According to the Owner, maintenance repair work was conducted in November 2023 to address the recommendations of the 2022 Regular Inspection, including repairs to cracks in the spillway training walls, repairs to voids between the spillway concrete footing and grouted riprap apron and the placement and grouting of additional riprap to the eroded downstream apron.

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

CREST

Description:	Well-maintained grass cover throughout the crest on both sides of the dam.
Vertical Alignment:	Crest appeared level on both sides of spillway.
Horizontal Alignment:	Curved with a uniform crest width of about 13 feet. Crest width adjacent to the spillway was slightly narrower at about 12 feet. Crest was wider on the left side near the restaurant.
Surface Cracks:	None observed.
Settlement:	None observed.
Unusual Conditions:	None observed.

UPSTREAM SLOPE

Description:	Well-maintained grass cover throughout the slope on both sides of the dam.
Slope Estimate (H:V):	3:1 with a bench (about 12 feet wide) below the normal pool level on the left side.
Trees, Undesirable Growth or Debris, Animal Burrows:	Minor weedy/woody vegetation observed along the lake edge on the right side. During previous inspections, the Owner reported that there were muskrat burrows in the upstream slope that were filled in. No other burrows were observed.
Sloughing, Subsidence or Depressions:	Minor erosion of the slope was observed along the lake edge on the right side of dam. Minor vertical scarping (measured at about 6 to 8 inches deep) was observed along the lake edge on both sides of the dam. Scarping conditions have been observed in past inspections and no significant change was apparent. Minor settlement was observed on the upstream slope on the left side along the left spillway training wall. The settlement measured about 1 foot deep and should be repaired.
Slope Protection:	Some scattered stone was observed on the right side of dam along the lake edge between the spillway and the bend in the dam. Large stone was observed along the lake edge to the left of the spillway. Stones on both sides of dam were too sparse to help protect the slope from erosion.
Surface Cracks or Movement at Toe:	Toe was submerged. Unable to observe.
Unusual Conditions:	A small erosion gully was observed along the right side upstream slope at the contact with the right abutment/beach area during the 2016 and prior inspections. Small stone was placed in the erosion area prior to the 2018 inspection. The stone appeared stable and no significant erosion was apparent. Chain link fence fabric was laid on the upstream slope on the right side of dam to prevent muskrats from burrowing into the slope. The top edge of the fabric

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

was about 15 inches above the normal lake level and continued into the lake. However, as noted above, the Owner stated that muskrats still burrow into the slope above the fence.

A short segmental block retaining wall was constructed along the outdoor dining area just upstream of the restaurant on the left side between the 2016 and 2018 inspections. Prior to the 2020 inspection, an additional section of retaining wall was added to the left to expand the outdoor dining area. Based on a comparison with photos from 2022, no significant additional modifications were observed in the outdoor dining area during this inspection.

DOWNSTREAM SLOPE

Description: Well-maintained grass cover throughout the slope on both sides of the dam. Large riprap lines the bottom of the slope adjacent to the spillway training walls on both sides of the dam. The slope adjacent to the restaurant consists of a partially buried rock rubble wall.

Slope Estimate (H:V): 3:1 on the right side and immediately left of the spillway structure. Slope was steeper (approximately 2:1) adjacent to the restaurant on the left side with a partially buried rock rubble wall.

Trees, Undesirable Growth or Debris, Animal

Burrows: None observed.

Sloughing, Subsidence or Depressions: Minor erosion of downstream slope was observed at the top of slope to the left of the spillway. No other problems were observed.

Surface Cracks or Movement at Toe: None observed.

Seepage: None observed. Slopes were dry during this inspection.

External Drainage System (Ditches, Trenches, Blanket):

None

Condition Around Outlet Structure: Earthen contact with the spillway training walls appeared stable. Large riprap at bottom of slope adjacent to the spillway training walls appeared stable.

Unusual Conditions: There was filter fabric exposed at the bottom of the slope beneath the riprap at the contact with the spillway training walls on both sides. Riprap may have become displaced in these locations. This condition was observed during previous inspections and no significant change was apparent during this inspection.

Some smaller stones in the rock rubble wall near the restaurant were displaced mid-slope. This condition was observed during the 2018, 2020 and 2022 inspections. No significant change was observed since the 2022 inspection.

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

ABUTMENTS AND TOE AREA

Erosion at Contact:	No significant erosion observed. Abutments and downstream toe areas appeared stable.
Seepage or Wet Area Along Contact:	<p>During past inspections, the downstream toe on the right side was noted to be soft and moist. This condition was likely due to the relatively flat terrain with very little positive drainage throughout the downstream toe area.</p> <p>During the 2018 inspection, there was a soft, wet area along downstream toe on the right side starting about 25 feet right of the spillway training wall. The area was measured to be about 60 feet long by 20 feet wide. Similar conditions were observed during the 2022 inspection. The downstream toe area was noted to be dry during the 2020 inspection.</p> <p>The downstream toe areas on both sides of the spillway were dry during this inspection.</p>
Signs of Movement:	None observed.
Depressions, Sinkholes:	A few small, shallow depressions were observed along the downstream toe, likely due to mowing equipment.
Unusual Conditions:	Minor vehicular rutting was observed in the downstream toe area.

SEEPAGE AND TOE DRAIN / RELIEF WELL FLOW SUMMATION

Location	Estimated Flow:	Color (Turbidity)
None observed.	N/A	N/A

SADDLE DIKE

DESCRIPTION OF STRUCTURE

The saddle dike is a 140-foot long earthen embankment located about 250 feet to the east (or left) of the primary spillway. The dike appeared stable and in generally good condition. The crest and slopes appeared to be well maintained with good grass cover. A 6-foot high PVC privacy fencing is located over the berm between Lots 114 and 113 and Lots 113 and 112 of Block 3001. Short sections of wrought iron fencing extend from the ends of the PVC fencing into the lake. Rocks line the lake edge from the spillway to the left end of the dike. No problems were observed or apparent at the dike and conditions appeared similar to the 2022 inspection.

EXAMINATION OF SPILLWAYS AND OUTLET WORKS

TYPES AND DESCRIPTION OF SPILLWAYS

Primary:	70-foot long semi-circular concrete overflow weir.
Secondary:	None
Emergency:	None
Other:	None

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ENTRANCE CHANNEL

- Description :** Open to the impoundment.
- Vegetation (trees, bushes, etc.):** None observed.
- Debris:** None observed.
- Channel Side-Slope Stability:** Spillway approach was submerged but no problems were apparent.
- Slope Protection/Erosion:** Riprap protects the approach to the low level outlet, but the approach was submerged and riprap could not be observed.
- Unusual Conditions:** None observed.

SPILLWAY CREST AND DOWNSTREAM FACE

- Description:** 70-foot long semi-circular concrete overflow weir.
- Condition of Material:** Concrete appeared intact and in generally good condition. No significant cracks or spalls were observed on the crest or downstream face of the spillway. Minor shrinkage cracks with efflorescence were observed along the base of the downstream face of the spillway. No significant change in conditions was apparent since the 2022 inspection.
- Leakage:** A few minor weeps were observed through shrinkage cracks on the downstream face near the bottom of the weir. Flow rate was too small to measure. Portions of the spillway downstream face were wet due to wave action from windy conditions, but no leakage was apparent at the joints. .
- Signs of Movement:** No signs of movement were observed or apparent. Spillway crest appeared level.
- Joints:** Joint filler material within the two joints in the downstream face of the spillway appeared intact but were showing continuing signs of weathering and deterioration (drying, cracking). No displacement was observed across the joints in the weir or at the contacts with the training walls.
- Following the 2020 inspection, the Owner repaired the joint material at the joints between the spillway and the training walls. The material was showing signs of weathering and deterioration (drying, cracking) during the 2022 inspection. During this inspection, the joint filler material was missing along the bottom 2 feet of both walls similar to conditions observed during past inspections.
- The contact between the spillway downstream face and concrete footing appeared intact. During previous inspections, voids were observed in the center of the spillway between the right and left joints. The voids at the center of the spillway were repaired in November 2023 and the repairs appeared intact.
- One minor void was also observed between the concrete footing and grouted riprap on the left side but this void did not appear repaired during the November 2023 work.
- Unusual Conditions:** None observed.

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

SPILLWAY TRAINING WALLS

Description: Reinforced concrete walls connected to ends of spillway crest.

Condition of Material: Shrinkage cracks were observed along both walls. Pattern or map cracking of the concrete was observed in various locations on both training walls, but the walls appeared intact. A rust-colored discoloration was observed along the base of the training walls. These conditions were observed during previous inspections and no significant change was apparent.

During previous inspections, several vertical cracks with efflorescence were observed at various spacing along both training walls. One 5-foot long (measured this inspection) horizontal crack and minor spall with efflorescence was previously observed at the downstream end of the right training wall. A horizontal crack was previously observed in the top of the right training wall extending from the downstream end of the wall to the fence post. The vertical cracks in the training walls and the horizontal cracks in the downstream end of the right wall were repaired in November 2023. The repairs appeared intact. Similar to previous inspections, a few minor horizontal cracks with efflorescence were observed at the contacts between the training walls and spillway. Efflorescence appeared more prevalent on the right training wall.

Leakage: A minor weep was observed in a crack in the bottom of the left training wall near the upstream end of the wall. Flow rate was too small to measure.

Signs of Movement: No signs of movement were observed or apparent. Walls appeared straight and no displacement was observed at the contact with the spillway or grouted riprap apron.

Joints: No joints in training walls. As noted above, the joint filler material was missing at the joints between the spillway and the training walls. Contacts between training walls, concrete footing and spillway appeared intact and in good condition.

Drains: None

Unusual Conditions: Chain link fence located along top of both training walls. The fence appeared to be in good condition. The previously observed loose fence posts were repaired in November 2023.

SPILLWAY DISCHARGE CHANNEL

Description: Consists of a grouted riprap apron between concrete spillway footing and training wall footings, extending to the end of training walls.

Condition of Material: The spillway and training wall footings appeared intact with no significant cracks or spalls. During previous inspections, some minor voids were observed between the concrete footings and grouted riprap mainly near the center of the spillway. The voids were repaired in November 2023 and the repairs appeared intact. As noted earlier, one minor void was observed between the concrete spillway footing and grouted riprap on the left side of the spillway during this inspection.

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

Grouted riprap appeared intact and in good condition with some missing stones near the downstream end of the training walls. No voids were observed in the grouted riprap. A transverse crack was observed in the grouted riprap in between the training walls. The crack measured about 0.5 inches wide (maximum) and extended from the left edge to about halfway across the grouted riprap portion of the channel. The crack should be repaired.

Vegetation (trees, bushes): None observed.

Debris: None observed.

Channel Side-Slope Stability: Channel sides protected by concrete training walls. Training walls were stable.

Erosion: No significant erosion observed. Grouted riprap was in generally good condition.

Unusual Conditions: The grouted riprap was extended beyond the training walls in November 2023. See discussion in Downstream Apron section.

DOWNSTREAM APRON

Description: Grouted riprap discharge channel transitions into loose riprap apron at the end of the training walls. As noted above, the grouted riprap was extended downstream to repair the eroded downstream apron in November 2023.

Condition of Material: The grouted riprap extension appeared intact and stable. No significant cracks, voids or displaced riprap were observed.

Signs of Movement: During previous inspections, an area of the riprap apron was displaced, possibly a result of the steep transition from the discharge channel to the apron. The area was repaired by extending the grouted riprap discharge channel several feet downstream and sloping the grouted riprap to create a shallower transition to the loose riprap apron. The grouted riprap extension appeared stable.

Unusual Conditions: None observed.

PLUNGE POOL

Description: Downstream riprap apron transitions into a riprap-lined plunge pool.

Vegetation (trees, bushes): Stand of thick cattails was removed from the plunge pool since the 2022 inspection. Several large trees and grassy vegetation were observed along the sides of the channel.

Condition of Material: Riprap appeared to be in good condition.

Signs of Movement: No movement was observed. Riprap appeared stable.

Erosion: No signs of erosion were apparent.

Unusual Conditions: None observed.

SENECA LAKE DAM VISUAL INSPECTION CHECKLIST

DOWNSTREAM CHANNEL

- Description:** Winding, clean natural channel with some rock.
- Vegetation (trees, bushes):** Several large trees, brush and grassy vegetation were observed along the channel banks. A stand of phragmites was observed in the channel.
- Debris:** None observed.
- Channel Side-Slope Stability:** Slopes appeared stable.
- Erosion:** No significant erosion was observed.
- Unusual Conditions:** None observed.

LOW LEVEL OUTLET

- Description:** 18-inch square sluice gate mounted on the downstream face of spillway. Sluice gate is controlled by a remote hydraulic operator that is located within an enclosure on the crest of the dam immediately right of the spillway training wall.
- Condition:** The Owner indicated that the sluice gate was operable, and no problems were encountered with the hydraulic operator during past operations. The enclosure was opened during this inspection, and some rust was observed on the hydraulic cylinder encasement.
- Trash Rack:** None

Leakage

Location	Estimated Flow
Dripping was observed from the downstream face of the gate.	Dripping

Unusual Conditions: None observed or reported.

Was the Low Level Outlet operated during the inspection? No

Were there difficulties operating the Low Level Outlet? Owner indicated that there are no problems with the low level outlet system.

When was the Low Level Outlet last operated and did this conform with the Operation and Maintenance procedures? The Owner indicated that the low level outlet was operated in September 2024. The Owner typically operates the gate twice a year (Spring and Fall).

Miscellaneous: The hydraulic operator enclosure is located on the right-side dam embankment crest adjacent to the right spillway training wall. A steel plate covers a missing section of the enclosure's concrete footing. The lock on the operator enclosure was in place.

**SENECA LAKE DAM
VISUAL INSPECTION CHECKLIST**

EXAMINATION OF OTHER FEATURES

INSTRUMENTATION (Monumentation / Surveys, Observation Wells, Weirs, Piezometers, Etc. location, condition)

Item	Location	Condition
Remote Hydraulic Sluice Gate Operator	The operator box is located on the right dam embankment crest adjacent to the right spillway training wall.	See Low Level Outlet above.

RESERVOIR

Slopes (H:V):	Appeared stable.	
Sedimentation:	Unknown	
Unusual Conditions Which Affect the Dam:	During previous inspections, the Owner indicated that beavers have historically blocked the low level outlet and the Owners occasionally remove debris. No beaver activity was observed during this inspection.	
Unusual Conditions:	None observed.	

APPURTENANT STRUCTURES

Item	Location	Condition
None		

**SENECA LAKE DAM
VISUAL INSPECTION CHECKLIST**

CONCLUSION

DAM INSPECTION PROGRAM GUIDELINES

The following new guidelines have been established by the NJDEP Bureau of Dam Safety & Flood Control to help meet the requirements of the National Inventory of Dams condition assessment of existing dam structures. Please follow the guidelines/definitions below and select the appropriate checkbox.

SATISFACTORY

No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria. Minor maintenance items may be required.

FAIR

Acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Minor deficiencies may exist that require remedial action and/or secondary studies or investigations.

POOR

A dam safety deficiency is recognized for any required loading condition (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Remedial action is necessary. POOR also applies when further critical studies or investigations are needed to identify any potential dam safety deficiencies.

UNSATISFACTORY

Considered unsafe. A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. Reservoir restrictions may be necessary.

I hereby state that the dam structure referenced herein was personally inspected by me and in my professional opinion based on the visual inspection, the dam was found to be in the following condition (**select one only**):

- SATISFACTORY
- FAIR
- POOR
- UNSATISFACTORY

**SENECA LAKE DAM
VISUAL INSPECTION CHECKLIST**

CONCLUSION (continued)

GZA recommends the following repairs be made immediately:

1. **Cut weedy/woody vegetation on the right side upstream slope along the lake edge.**
2. **Repair settled area of upstream slope along the left spillway training wall.**
3. **Add topsoil to eroded area at top of downstream slope left of the spillway. Reseed the area to establish grass cover.**
4. **Repair the crack in the grouted riprap discharge channel between the training walls.**
5. **Fill the minor void between the spillway concrete footing and the grouted riprap apron on the left side.**

The following long term improvements should also be undertaken:

1. **Visually monitor weeps in the spillway and training walls. Reports any changes in rate and/or color.**
2. **Continue to visually monitor cracks in the concrete spillway training walls.**

The following studies are recommended:	<input type="checkbox"/> Hydrologic and Hydraulic analysis <input type="checkbox"/> Stability analysis <input type="checkbox"/> Failure/Inundation analysis <input type="checkbox"/> Other <input checked="" type="checkbox"/> None
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Have the recommendations above included those from the Phase I Inspection Report or previous Regular or Formal Inspection Reports? If not, indicate why. **No, the recommendations from the 2022 inspection were addressed during maintenance repair work in November 2023.**

EMERGENCY ACTION PLAN (This section must be completed for all Class I & II dams)

Date of Approved Plan: **July 26, 2012**

Date of Last Plan Revision: **January 1, 2023**

Is the notification flowchart complete and current? **No, Owner reported that updates will be completed in early 2025.**

(If the notification flow chart is not complete and current, all modifications, corrections, and additions must be made and replacement pages submitted with this report)

Is inundation mapping or a description included? If not, why? **Yes**

NJ Dam Safety Compliance Schedule Form (attached).

This form must be completed or the Inspection Report will be deemed incomplete. **Yes**

Name of Professional Engineering Company/Consultant Representing the Owner:

**GZA GeoEnvironmental, Inc.
55 Lane Road, Suite 407
Fairfield, New Jersey 07004
(973) 774-3300**

New Jersey Licensed Professional Engineers representing the dam owner in responsible charge of the inspection:

Jessica A. Bergmann, P.E.

Sign _____ Date _____

New Jersey Professional Engineer License Number: **24GE04842200** SEAL

Christopher S. Adams, P.E.

Sign _____ Date _____

New Jersey Professional Engineer License Number: **24GE03130000** SEAL

**Seneca Lake Dam
2024 Inspection**



Photo No. 1: Right side dam crest looking left toward the spillway.



Photo No. 2: Right side dam crest looking right toward the right abutment.

**Seneca Lake Dam
2024 Inspection**



Photo No. 3: Left side dam crest looking right toward the spillway.



Photo No. 4: Left side dam crest looking left toward the restaurant and dike.

**Seneca Lake Dam
2024 Inspection**



**Photo No. 5: Right side upstream slope of the dam
looking right toward the bend.**



**Photo No. 6: Right side upstream slope of the dam
looking left toward the bend.**

**Seneca Lake Dam
2024 Inspection**



**Photo No. 7: Left side upstream slope of the dam looking right toward the spillway.
Note the scarping along the lake edge at the bench.**



**Photo No. 8: Left side upstream slope of the dam looking left along the restaurant.
Note the segmental block retaining walls.**

**Seneca Lake Dam
2024 Inspection**



Photo No. 9: Right side downstream slope and toe of the dam looking left toward the spillway.



Photo No. 10: Right side downstream slope and toe of the dam looking right toward the right abutment.



Photo No. 11: Left side downstream slope of the dam looking upstream from the toe.



Photo No. 12: Left side downstream slope of the dam looking downstream. Note the area of minor erosion on the slope.



Photo No. 13: Left side downstream slope of the dam looking left toward the restaurant.



Photo No. 14: Closeup of the rock rubble wall on the left side downstream slope of the dam looking left toward the restaurant.

**Seneca Lake Dam
2024 Inspection**



Photo No. 15: Dike on Lot 113 looking left.



Photo No. 16: Dike on Lot 112 looking left.

**Seneca Lake Dam
2024 Inspection**



Photo No. 17: Spillway entrance, crest and downstream face looking left.



Photo No. 18: Downstream face of spillway looking upstream.



Photo No. 19: Minor weeps in the downstream face of spillway.



Photo No. 20: Repaired void between the spillway footing and the grouted riprap apron.

**Seneca Lake Dam
2024 Inspection**



Photo No. 21: Right side downstream face of spillway looking upstream.



**Photo No. 22: Joint between the spillway and the right side training wall.
Note the the missing joint material.**



**Photo No. 23: Left side downstream face of spillway looking upstream.
Note the the missing joint material.**



**Photo No. 24: Joint between the spillway and the left side training wall.
Note the the missing joint material. Also note the minor weep from
the repaired crack in the bottom of the left training wall.**



**Photo No. 25: Right side spillway training wall looking downstream.
Note the efflorescence and repaired cracks in the wall.**



**Photo No. 26: Left side spillway training wall looking downstream.
Note the efflorescence and repaired cracks in the wall. Also note the
minor weep from the repaired crack in the bottom of the left training wall.**



**Photo No. 27: Downstream end of the right spillway training wall.
Note that the 5-foot long horizontal crack was repaired.**



**Photo No. 28: Top of the right training wall at the downstream end of the wall
Note that the crack was repaired.**



Photo No. 29: Grouted riprap discharge channel looking downstream.



Photo No. 30: Crack across the grouted riprap discharge channel looking toward the right training wall.

**Seneca Lake Dam
2024 Inspection**



Photo No. 31: Downstream riprap apron looking right. Note the extension of the grouted riprap onto the apron since the 2022 inspection.



Photo No. 32: Downstream riprap apron looking upstream. Note the extension of the grouted riprap onto the apron since the 2022 inspection.



Photo No. 33: Looking downstream at the plunge pool and exit channel toward the Tomahawk Trail bridge.



Photo No. 34: Closeup of the low level outlet sluice gate. Note the deflection cover over the hydraulic operating cylinder.



Photo No. 35: Hydraulic operator and enclosure for the low level outlet sluice gate.



Photo No. 36: Closeup of the hydraulic operator for the low level outlet sluice gate.



USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of the Client for the stated purpose(s) and location(s) identified in the Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. Our findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. Our services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

DAM INSPECTION

4. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.
5. In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.
6. It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

TYPES OF DAM INSPECTIONS PER NJDEP GUIDELINES

7. Per NJDEP guidelines, a Regular Inspection is a visual inspection of a dam to detect any signs of deterioration in material, developing weaknesses, or unsafe hydraulic or structural behavior. A review of existing hydrologic and hydraulic analyses, stability analyses, and failure/inundation analyses is not part of the scope of a Regular Inspection.
8. Per NJDEP guidelines, a Formal Inspection is a visual inspection and a performance evaluation of a dam. Formal Inspections include a review of records on project design, construction, and performance.

SUBSURFACE CONDITIONS

9. If presented, the generalized soil profile(s) and description, along with the conclusions and recommendations provided in our Report, are based in part on widely-spaced subsurface explorations by GZA and/or others, with a limited number of soil and/or rock samples and groundwater /piezometers data and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
10. Water level readings have been made in test holes (as described in the Report), monitoring wells and piezometers, at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this



Report. Fluctuations in the groundwater and piezometer levels, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, reservoir and tailwater levels, the presence of subsurface utilities, and/or natural or artificially induced perturbations.

GENERAL

11. The observations described in this report were made under the conditions stated therein. The conclusions presented were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client.
12. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein available to GZA at the time of the evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.
13. Any GZA hydrologic analysis presented herein is for the rainfall volumes and distributions stated herein. For storm conditions other than those analyzed, the response of the site's spillway, impoundment, and drainage network has not been evaluated.
14. Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the structure or site, or to structures on the site was unavailable or limited, GZA renders no opinion as to the condition of that portion of the site or structure. In particular, it is noted that water levels in the impoundment and elsewhere and/or flow over the spillway may have limited GZA's ability to make observations of underwater portions of the structure. Excessive vegetation, when present, also inhibits observations.
15. In reviewing this Report, it should be realized that the reported condition of the dam is based on observations of field conditions during the course of this study along with data made available to GZA. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued inspection and care can there be any chance that unsafe conditions be detected.

COMPLIANCE WITH CODES AND REGULATIONS

16. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.
17. This scope of work does not include an assessment of the need for fences, gates, no-trespassing signs, boat/swimmer barriers, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

COST ESTIMATES

18. Unless otherwise stated, our cost estimates are for comparative, or general planning purposes. These estimates may involve approximate quantity evaluations and may not be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over the labor and material costs required to plan and execute the anticipated work, our estimates were made using our experience and readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

ADDITIONAL SERVICES

19. It is recommended that GZA be retained to provide services during any future: site observations, explorations, evaluations, design, implementation activities, construction and/or implementation of remedial measures recommended in this Report. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.