MARIAVILLE LAKE DAM
ENGINEERING ASSESSMENT REPORT

for the

MARIAVILLE LAKE CIVIC ASSOCIATION

Batter Road – County Rte. 94
Town of Duanesburg
Schenectady County
Tributary to South Chuctununda Creek

Owner/Operator
Mariaville Civic Association
Mariaville Lake, NY

Project No. 240647-000R
January 2025

KB Engineering & Architecture, P.C.
Albany York Office | 100 Great Oaks Blvd, | Suite 114 | Albany, New York 12203
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INTRODUCTION

The Mariaville Lake Dam (ID #189-0224) is located along a section of Batter Street (County Route 94) on the northerly side of Mariaville Lake in the Town of Duanesburg, Schenectady County, New York. The dam is located at Latitude N42°49'41", Longitude E74°08'11" on the Duanesburg USGS Quadrangle. The dam is owned and operated, and maintained by the Mariaville Civic Association (MCA). Mariaville Lake is used primarily for recreational purposes.

The Mariaville Lake Dam is classified under the Dam Safety Regulation Hazard Classification (Part 673.5), as a Small Class "C" or "High Hazard" Dam. The New York State Department of Environmental Conservation (NYSDEC) "Guidelines for Design of Dams" lists the qualifications of a Class "C" dam as "dam failure can cause loss of life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways, and railroads".

Title 6 of New York Rules and Regulations, Part 673.13 requires the preparation of an Engineering Assessment Report, which must be submitted to the NYSDEC.

The MCA commissioned KB Engineering & Architecture, P.C. (KB Engineering) to perform a complete engineering assessment of the Mariaville Lake Dam and prepare a report in accordance with the regulations. This Engineering Assessment Report describes the background, review of available dam documents, hazard classification evaluation, safety inspection, spillway capacity evaluation, low level outlet analysis, structural stability evaluation, findings, conclusions, and recommendations for the dam.

BACKGROUND

The Mariaville Lake dam, located along the northern shore of Mariaville Lake, is built across the upper reach of the South Chuctanunda Creek. The dam was first built as an earthen dam in the 1700's for a factory manufacturing shovels. In 1830, the dam was rebuilt using clay, fieldstone and a wooden spillway for operation of a gristmill and sawmill. In 1900, the wooden spillway was replaced with a concrete spillway, and then in 1917 the spillway was re-pointed, widened and thickened.

Ownership of the dam was later conveyed to the MCA with the primary use being recreation. In October 1980 the US Army Corps of Engineers performed an inspection of the dam and in their 1981 "Phase 1 Inspection Report", they indicated "The examination of documents and the visual inspection of the Mariaville Lake Dam did not reveal conditions that would constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and further action." These deficiencies were related to what the Corps described as a "serious deficiency in spillway capacity".

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The Corps also classified the dam as "small" in size and "high hazard, because of its location within the Village of Mariaville where several homes located along the banks of the downstream channel face a potential threat in case of dam failure". In 1989, representatives of the MCA submitted a Permit Application for extensive repair work listing the dam hazard class as Class "C" and a Dam Safety Permit was subsequently issued by NYSDEC to do the work. These repairs, completed in 1990, brought the dam into compliance with NYSDEC requirements and generally included adding an auxiliary spillway, capping/replacement and raising the height of deteriorated fieldstone dam abutment walls using new concrete abutment walls, and re-facing of portions of the spillway and abutments.

The NYSDEC dam inventory sheet is included in Exhibit A.

EXISTING DAM CONFIGURATION

Mariaville Lake Dam is a concrete structure with two abutment walls on either side of the dam's spillway. The spillway is located approximately in the center of the dam. Flashboards have been installed on the spillway and are used to maintain the water surface elevation of the lake. The western side of the spillway is raised approximately 3-feet above the service spillway invert, and acts as an auxiliary spillway. Both the service and auxiliary spillways empty into the drop inlet described in the paragraph below. A slide gate is mounted to the face of a bump out in the center of the concrete spillway structure that is used to open or close the dam's 28-inch diameter low level outlet pipe. An abandoned gate valve stem encased in concrete protrudes above the face of the spillway approximately 3-feet behind the slide gate.

Immediately downstream and buttressing the dam is a roadway embankment carrying Batter Street, which is maintained by Schenectady County (County). The lake outlets water over the spillway into a concrete/stone masonry drop inlet box immediately downstream of the spillway. Water is then conveyed from the drop inlet to a box culvert beneath the roadway embankment and into the South Chuctanunda Creek. In 2004, the deteriorated concrete box culvert beneath Batter Street was lined with a 48-inch diameter smooth bore pipe, grouted in place, the pipe extended, and the downstream roadway embankment slope flattened and stabilized, all by the County. Then in 2005, the drop inlet box was refaced by the County with reinforced shotcrete. In 2007, NYSDEC raised concerns that the County work had been done without a Dam Safety Permit along with concerns about the hydraulic capacity of the new culvert pipe. NYSDEC requested that design information and drawings be submitted for review in order to assess the impact the roadway work had on the dam and the County provided this information to NYSDEC as requested.

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To the west of the dam, there is a retaining wall that holds back the embankment for Batter St and abuts against the side of the dam. This retaining wall does not appear to be on property owned by the MCA.

A site plan and cross section of the dam are included in Exhibit B.

HAZARD CLASSIFICATION EVALUATION

The Mariaville Lake Dam is classified under the Dam Safety Regulation Hazard Classification (Part 673.5), as a small Class "C" or "High Hazard" Dam. Based on our review of the dam, the height of the dam, the reservoir size, and field reconnaissance of the downstream area, we have no disagreement with the Class C hazard classification designated for the dam. It should also be noted that the regulations for a Class C hazard dam are similar to those for a Class B hazard dam, with the main difference being the frequency of dam safety inspections required by a registered professional engineer. Therefore, if the MCA were to pursue reclassification, little benefit would be provided.

COMPLETE SAFETY INSPECTION

Along with a review of the existing documentation of the dam, a visual on-site inspection of the Mariaville Lake Dam was performed on Friday, August 2, 2024, by Brett Newberry, P.E. of KB Engineering & Architecture, P.C. with Robert Cuttita and Eric Unser in attendance from the MLCA. Seaway Diving & Salvage Company, Inc. also performed an underwater inspection of the dam face, low level outlet gate, and surrounding area on Friday June 21, 2024. The Inspection Report with field observation notes are included in Exhibit C.

The present condition of the concrete headwalls, headworks, spillway, drop inlet, shoreline abutting the dam, Batter Street, downstream embankment, outlet pipe, dam area in general, and immediate downstream water course were all reviewed in the field for any evidence of deficiencies.

The conclusions and recommendations shown in the Inspection Report are summarized as follows:

- As a result of the dam safety inspection, the earthen dam appears to be in overall good condition with a few relatively minor deficiencies.
- The concrete spillway and drop inlet appear to be in reasonably good condition with a few relatively minor deficiencies, including the presence of vegetation in joints and cracks, and spalled areas of concrete around the abandoned low level outlet valve and spillway

walls. There is also a loose piece of concrete at the corner of the structure where the slide gate is mounted.
- There are (2) lag bolts missing from the slide gate frame.
- The visible portions of the concrete headwall appear to be in good condition.
- The downstream embankment is overgrown with vegetation and should be mowed to allow for inspection and access. It should be noted that this embankment is not owned by the MCA.
- No conditions were visible at the time of the visit that would indicate an immediate or imminent danger or safety concern for the public.
- The MCA should continue their ongoing efforts to review on a regular basis and keep current the Emergency Action Plan with all associated personnel. All involved personnel should know and follow the procedures and precautions described in the Emergency Action Plan.
- Routine inspections should be made on a regularly scheduled basis as well as following any major weather event. Any changes should be reported and reviewed immediately for the potential of developing into a dangerous situation.
- The deficiencies noted during the dam safety inspection should be addressed as described in the Dam Safety Inspection Report.

On June 21, 2024, a diver performed an underwater inspection (attached in Exhibits section) of the dam face, low level outlet slide gate, and surrounding area. A summary of the findings is as follows:

- The upstream concrete face was in excellent condition with little to no cracking.
- Minor efflorescence was observed in cracks above the splash zone.
- Minor evidence of concrete deterioration was observed in the splash zone from freeze thaw cycles.
- The retaining wall to the west of the dam was observed to be in poor condition, cracked, and leaning towards the lake.
- The low level outlet slide gate was exercised and functions as intended.
- Four voids were observed in the lake bed approximately 10-30 feet from the face of the dam, consistent with the dive inspection performed in 2013.
- A video recording was made of the dive, and KB Engineering has not received a copy of the recording for review to date.

Routine inspections should be made on a regularly scheduled basis as well as following any major weather event. Any changes should be reported and reviewed immediately for the potential of developing into a dangerous situation.

All proposed repairs and construction activities planned to be performed on the dam should be reviewed by NYSDEC to determine if permits are required.

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EVALUATION OF THE DAM'S SPILLWAY CAPACITY

In accordance with the *"Guidelines"*, existing small Class "C" dams should have adequate spillway capacity to pass a spillway design flood (SDF) equal to 50% of the probable maximum flood (PMF) without overtopping. We reviewed the previous analysis performed during the last Engineering Assessment performed by John M. McDonald Engineering, P.C., which is attached as an exhibit. As the PMP storm and the watershed area in general have not significantly changed since the previous analysis, the review determined that the previous analysis is still valid. The previous analysis determined the water level at the SDF would not overtop the dam. Based on this, the spillway capacity is adequate to pass the SDF and is in compliance with the *"Guidelines"*.

The previous model had determined the watershed boundary used for analysis based on USGS topographic maps of the area of the Duanesburg and Rotterdam Junction quadrangles. A map of the watershed is included in Exhibit D. Soil data, including hydrologic soil group, was obtained from the USDA web soil survey. Rainfall data input into the model was taken HMR-51 for a 6-hour PMP event for drainage areas up to 10 square miles.

The rainfall for a PMP storm event of 24-inches was input into the HydroCAD model and produced an inflow of 11,012.36 cfs. Next, links were added to each source of inflow into Mariaville Lake to reduce the discharge by a factor of 0.5 to represent the SDF event and reduce the inflow of the PMP storm to 50%. This reduced the inflow to 5,192.05 cfs to represent the SDF event equal to 50% of the PMP event inflow.

During the SDF event, the water surface elevation of the reservoir in the HydroCAD model peaked at 1279.26 feet, or approximately two inches below the crest of the dam with a peak outflow of 241.38 cfs. This model also assumed that the flashboards would be in place during this storm, effectively raising the service spillway crest to 1275.51 feet. As the dam was not overtopped by the SDF event with the flashboards in place, the existing spillway has adequate capacity to pass the SDF.

The HydroCAD model used in this analysis is included in Exhibit E.

Calculations included in Exhibit E also show the spillway has adequate capacity to evacuate 75% of the flood volume within 48 hours, with no inflow, as required in the *"Guidelines".*

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EVALUATION OF THE DAM'S OUTLET WORKS CAPACITY

The NYSDEC *Guidelines* require that a dam have a low-level outlet or drain "for emptying or lowering the water in case of emergency; for inspection and maintenance of the dam, reservoir, and appurtenances; and for releasing waters to meet downstream water requirements." The low-level outlet drain is required to drain 90% of the lake volume below the lowest spillway crest within a period of 14 days.

The Mariaville Lake Dam low-level outlet is comprised of a 28-inch diameter concrete pipe with an outlet invert of 1263.2 feet and at the approximate bottom of the lake. The 28-inch diameter low-level outlet then drains through the 48-inch diameter culvert at the bottom of the drop inlet spillway.

To evaluate the capacity of the low-level outlet, a HydroCAD model was developed to model the reservoir with the water surface at the lowest spillway crest elevation of 1274.4 feet. The reservoir was modeled based on previous bathymetric data obtained by KB Engineering, which show the lake bottom near an elevation of 1263.5 feet.

The HydroCAD model shows that the 28-inch outlet pipe has the capacity to empty approximately 99.3% of the volume of Mariaville Lake in 14 days. Therefore, the low-level outlet complies with the requirements of the *Guidelines*. The HydroCAD model is included in Exhibit F.

EVALUATION OF THE DAM'S STABILITY ANALYSIS

Using previously prepared drawings of the existing concrete gravity spillway located near the middle of the dam and earthen dam, a stability analysis of the structure was conducted.

A. Spillway Stability Analysis:

A stability analysis of the spillway was performed and is attached as an exhibit. The forces acting on the spillway were determined for the four loading conditions described in the *"Guidelines"*, which are normal reservoir level, ice loading at spillway crest, SDF reservoir level, and seismic loading at normal reservoir level. For these four cases, the spillway was analyzed for two modes of failure; overturning and sliding. Overturning moments, resisting moments, sliding forces, vertical forces, location of resultant, and resisting forces were all calculated for each of the four loading cases and for each of the two modes of failure.

The spillway stability analysis shows that for all loading conditions, the spillway meets or exceeds the stability requirements set forth in the *"Guidelines"* for overturning and sliding.

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Based on the results of the spillway stability analysis, no additional work is required to stabilize the concrete spillway, however there are other minor repairs described in the Dam Safety Inspection Report related to deterioration of the spillway structure that should be addressed. The spillway stability analysis is included in Exhibit G.

B. Earthen Dam Stability Analysis:

The downstream face of the dam was reconstructed in 2004 by the County when the HDPE pipe was installed inside of the box culvert using well drained, compacted NYSDOT approved gravel backfill over the outlet pipe. As part of the previous Engineering Assessment, KB Engineering reviewed construction photographs showing placement of the fill and compaction in controlled lifts. The gravely fill appeared uniform and dry. The construction plans of the downstream embankment show a slope of 2.5H:1V, however the embankment was surveyed in 2012 and showed the slope varying from 2.5H:1V to 4H:1V with an average approximately at 3H:1V. A typical section of the dam is attached in Exhibit B.

Our field inspection showed that the downstream embankment is in a similar condition as observed during the previous Engineering Assessment and survey. The inspection also did not reveal any sink holes, slips, wet spots, piping, or flow out of the downstream slope. Although some maintenance is recommended in the Dam Safety Inspection Report, the downstream slope that can be considered part of the dam is covered with a well established vegetative growth, with no large trees and is generally in good condition.

These observations would indicate that the upstream concrete headwall and dam construction serve to control seepage through the dam. In accordance with the *Guidelines*, the downstream slope should be no steeper than 3H:1V without seepage control and 2H:1V with seepage control.

The top width of the existing embankment, which carries the roadway is a minimum of approximately 36 feet wide. In accordance with the *Guidelines*, the top width of the embankment should be no less than 10 feet.

Based on the existing downstream slope geometry, materials of construction, existing top width, construction techniques, and field observations, the earthen embankment is stable and in compliance with the *Guidelines* and a full stability analysis is not warranted.

If changes are observed during any future routine inspection or following an event, an investigation and analysis to determine the reason for the changes, the effect on stability, and recommended repairs, are warranted. Determination of the cause for any observed change may also warrant an updated analysis. In addition, when the next Engineering

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Assessment is required, we recommend reviewing the dam construction, geometry, and field conditions again to verify whether changes to the requirements, or conditions at that time would warrant an updated analysis.

REVIEW OF THE DAM'S EMERGENCY ACTION PLAN

NYSDEC requires all owners of a Class B or Class C dam to prepare and maintain an Emergency Action Plan (EAP) in accordance with 6 NYCRR 673.7. The Emergency Action Plan is required to include procedures for the notification of an emergency, inundation maps or other acceptable description of the potential inundation area, procedures for implementing all other aspects of the emergency action plan, procedures for updating the plan, and other provisions the department deems necessary. The EAP prepared by the MCA, and updated January 2025, was reviewed as part of this assessment and appears to comply with NYSDEC requirements. The current EAP is included in Exhibit H.

SEPTEMBER 2023 SINKHOLE

On September 30, 2023, a small sinkhole was observed on the shoulder of Batter St on the backside of the dam, near the end of the western abutment. The County repaired the sink hole on October 4, 2023. The pavement was saw cut and removed down to approximately one foot below the surrounding sound pavement. Subbase material was installed, compacted, and a patch of asphalt was installed over the area. It should be noted that the water surface elevation of the lake was below the road at the time the sink hole was observed, and there were no visible whirlpools or turbulence in the lake.

Due to the location of the sinkhole, and the results of the diver's inspection report from June 2024, it appears that the condition of the existing retaining wall adjacent to the dam may have led to the formation of the sinkhole. The dive inspection noted that the retaining wall is deteriorated while the face of the dam is sound and in good condition. Therefore, it appears likely that the retaining wall may not be watertight and could allow water to pass through and make its way behind the concrete dam face.

Ownership of the retaining wall should be confirmed prior to the design of any repairs. It appears that the wall may be owned by the County. It is recommended that the retaining wall be replaced with a cast in place concrete wall to ensure water tightness. The retaining wall should be sealed against the dam abutment to protect Batter St and prevent water from making its way around the end of the dam abutment.

No other sinkholes or damage to the Batter St pavement were observed during the site inspection in August 2024.

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Photos of the sinkhole and repairs are attached in Exhibit I**.**

CONCLUSIONS AND RECOMMENDATIONS

The Mariaville Lake Dam engineering assessment involved review of existing documentation, a safety inspection, and analyses of the dam hydrology, hydraulics and stability. The dam is in conformance with current dam safety criteria, however there are maintenance and repairs that are required and described in this report. A proposed schedule to complete dam repair is included in Exhibit J.

As of November 5, 2024 most of the repairs recommended in this report have been completed including repairs to spalled areas of concrete, cracks have been sealed, vegetation removed from cracks and concrete joints, and the lag bolts in the slide gate frame have been replaced. Recommended repairs from the safety inspection that have been completed are noted as completed on the proposed schedule in Exhibit J. Photos showing the recently completed repair work are included in Exhibit K.

EXHIBIT A

NEW YORK STATE INVENTORY SHEET

NEW YORK STATE
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

New York State Inventory of Dams

Name of Dam: Mariaville Lake Dam
State ID: 189-0224

Hazard Code: C
See below for hazard code definition

Year Completed: 1925
Most Recent Inspection: 6/25/2010

Location Information:				
County	**Municipality**	**River or Stream**	**Latitude**	**Longitude**
Schenectady	Not Found	TR-SOUTH CHUCTANUNDA CREEK	42° 49' 41.002" N	74° 8' 11.0" W

Type:	
Type of Construction	**Purpose**
RE - Earth, MS - Masonry	Recreation

Technical Information:	
Federal ID Number	NY00169
Dam Length (feet)	136
Dam Height (feet)	16
Spillway Width (feet)	29
Maximum Discharge (cubic feet per second)	0
Maximum Storage (acre-feet)	1102
Normal Storage (acre-feet)	1102
Reservoir Surface Area (acres)	201
Drainage Area (square miles)	2.85
Basin	MOHAWK
Date of Data Update	11/17/2010

Note -- The Hazard Code denotes the downstream hazard potential in the event of a dam failure:

C = High Hazard
B = Intermediate Hazard
A = Low Hazard
0 = Null; No hazard code assigned

Also Note -- This data was exported from DEC's database on 08/30/11. Updates to data that occurred after 08/30/11 are not reflected here.

See more information about the New York State Inventory of Dams data set

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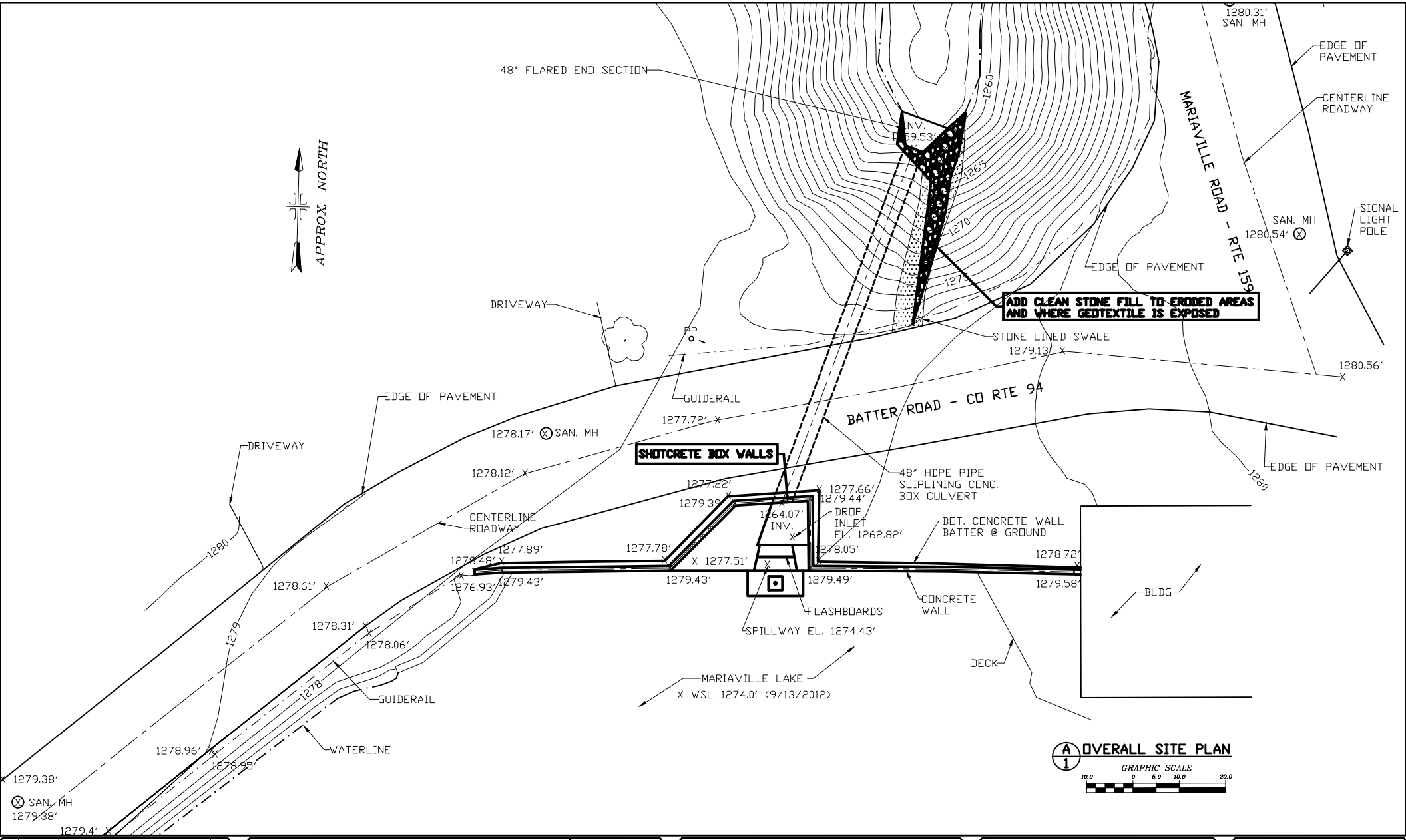
NYS DEC Homepage

Directions: To here - From here

EXHIBIT B
DAM SITE PLAN AND SECTIONS



A1 OVERALL SITE PLAN

GRAPHIC SCALE

10.0 0 5.0 10.0 20.0

NO.	DATE	REVISION	BY
00	09/2024	ORIGINAL ISSUE	BSN

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PROJ. ENGR.: BSN | DRAWN BY: BSN | CHECKED BY: DPC

MARIAVILLE CIVIC ASSOCIATION
SCHENECTADY COUNTY, NY

MARIAVILLE LAKE DAM

SHEET TITLE:

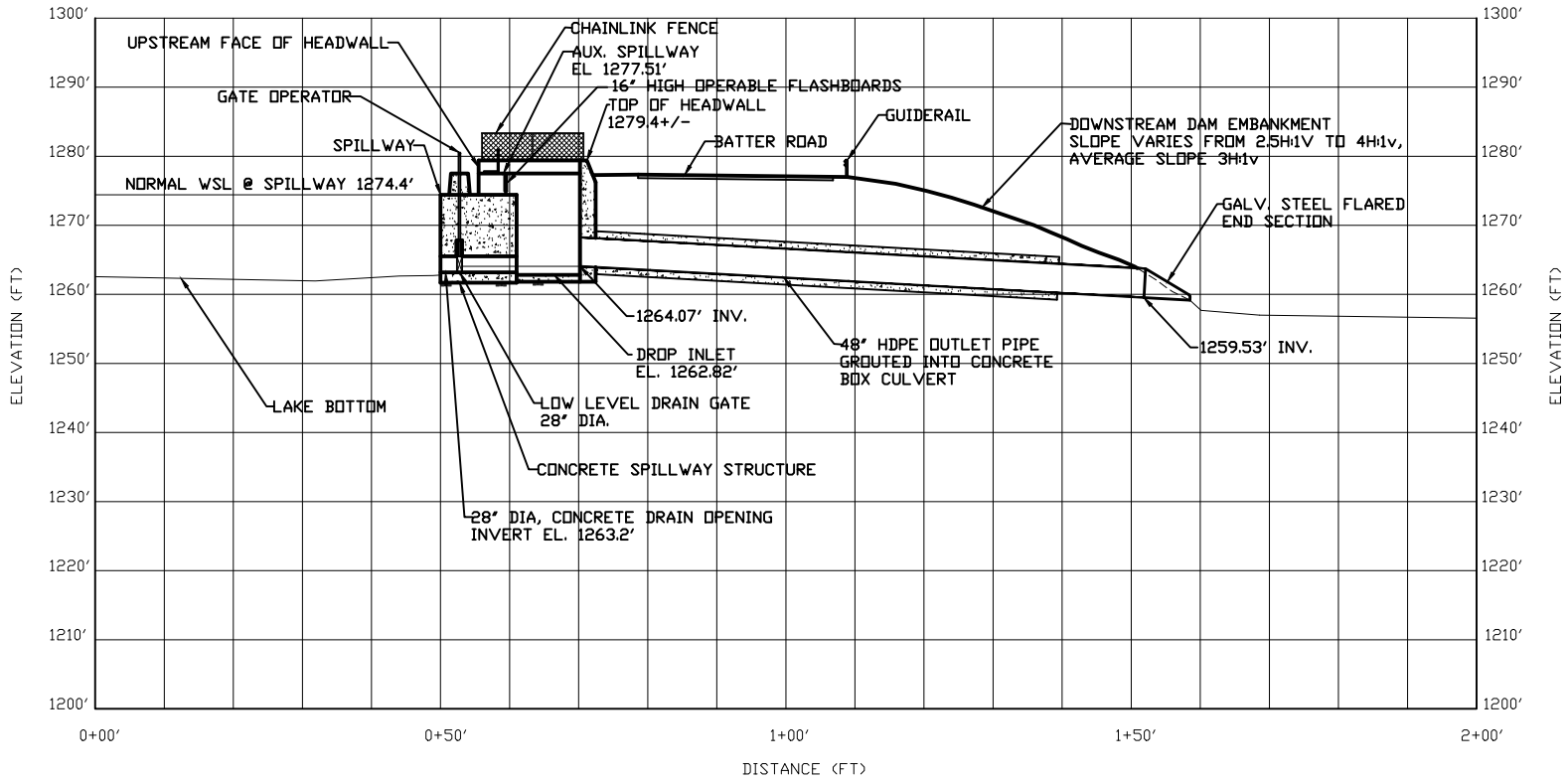
OVERALL SITE PLAN

SCALE: AS SHOWN

FILE NO.: 240647-005

DATE: SEPTEMBER 2024

SHEET NO.: 1



A/A2 SECTION THROUGH SPILLWAY & OUTLET PIPE

GRAPHIC SCALE

10.0 0 5.0 10.0 20.0

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MARIAVILLE CIVIC ASSOCIATION
SCHENECTADY COUNTY, NY

MARIAVILLE LAKE DAM

SHEET TITLE:

DAM CROSS SECTION

SCALE: AS SHOWN

FILE NO.: 240647-005

DATE: SEPTEMBER 2024

SHEET NO.: A2

EXHIBIT C
SAFETY INSPECTION REPORT

MARIAVILLE LAKE DAM
SAFETY INSPECTION REPORT

for the

MARIAVILLE LAKE CIVIC ASSOCIATION

Batter Road – County Rte. 94
Town of Duanesburg
Schenectady County
Tributary to South Chuctununda Creek

Owner/Operator
Mariaville Civic Association
Mariaville Lake, NY

Project No. GNY02WD-22329
Inspection Date: August 2, 2024

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EXHIBITS

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I. EXECUTIVE SUMMARY:

The Mariaville Lake Dam (ID #189-0024) is located on Mariaville Lake in the Town of Duanesburg, Schenectady County, New York. The dam is owned and maintained by the Mariaville Civic Association (MCA). This report describes the background, dam document review, safety inspection, findings, and recommendations for the dam.

The MCA commissioned KB Engineering & Architecture, P.C. to perform a safety inspection of the dam in accordance with dam safety regulations. The dam safety regulations state that the owner of a Class "B" or Class "C" dam undertake regular safety inspections performed by an engineer.

The Mariaville Lake Dam is classified under the Dam Safety Regulation Hazard Classification (Part 673.5), as a small Class "C" or "High Hazard" Dam. The Dam Safety Regulations require the Owner's submission of an Inspection & Maintenance (I&M) Plan, Emergency Action Plan (EAP), and Annual Certification, Safety Inspections and Engineering Assessments. NYSDEC "Guidelines for Design of Dams" lists a Class "C" dam as "dam failure can cause loss of life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways, and railroads".

A review of available information on the dam was performed by KB Engineering & Architecture, P.C., including existing plan drawings, the I&M Plan, EAP, and prior inspection reports.

On August 2, 2024, an on-site visual inspection was performed by KB Engineering & Architecture, P.C. to document the present condition of the dam and note any deficiencies found.

As a result of the dam safety inspection, the dam appears overall to be in good condition with a few relatively minor deficiencies that should be addressed. No conditions were visible at the time of the visit that would indicate an immediate or imminent danger or safety concern for the public.

Recommended repairs for those deficiencies are described in this report. Prior to commencing any repairs, all repairs and construction activities performed on the dam should be reviewed by NYSDEC to determine if permits are required. A permit for concrete repairs to the abandoned low level outlet valve structure was obtained in 2023.

II. INTRODUCTION:

Mariaville Civic Association (MCA) commissioned KB Engineering & Architecture, P.C. to perform a complete safety inspection of the Mariaville Lake Dam (NYS DEC ID #189-0024), which is owned and maintained by the MCA. This report describes the background, dam document review, safety inspection, findings, and recommendations for the dam.

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III. PROJECT LOCATION:

The Mariaville Lake Dam is located on Batter Street along the north side of Mariaville Lake in the Town of Duanesburg, Schenectady County, New York. The dam is located at Latitude N42°49'42", Longitude E74°08'08" on the Duanesburg Quadrangle.

IV. BACKGROUND:

The Mariaville Lake dam, located along the northern shore of Mariaville Lake, is built across the upper reach of the South Chuctanunda Creek. The dam was first built as an earthen dam in the 1700's for a factory manufacturing shovels. In 1830, the dam was rebuilt using clay, fieldstone and a wooden spillway for operation of a gristmill and sawmill. In 1900, the wooden spillway was replaced with a concrete spillway, and then in 1917 the spillway was re-pointed, widened and thickened.

Ownership of the dam was later conveyed to the MCA with the primary use being recreation. In October 1980 the Corps of Engineers performed an inspection of the dam and in their 1981 "Phase 1 Inspection Report", they indicated "The examination of documents and the visual inspection of the Mariaville Lake Dam did not reveal conditions that would constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and further action." These deficiencies were related to what the Corps described as a "serious deficiency in spillway capacity". The Corps also classified the dam as "small" in size and "high hazard, because of its location within the Village of Mariaville where several homes located along the banks of the downstream channel face a potential threat in case of dam failure". In 1989, representatives of the MCA submitted a Permit Application for extensive repair work listing the dam hazard class as Class "C" and a Dam Safety Permit was subsequently issued by NYSDEC to do the work. These repairs, completed in 1990, brought the dam into compliance with NYSDEC requirements and generally included adding an auxiliary spillway, capping/replacement and raising the height of deteriorated fieldstone dam abutment walls using new concrete abutment walls, and re-facing of portions of the spillway and abutments.

In the spring of 2015, the existing low-level outlet valve was replaced with a low-level outlet gate. The old valve was raised out of the flow way and the valve stem removed.

Immediately downstream and buttressing the dam is a roadway embankment carrying Batter Street, which is maintained by Schenectady County (County). The lake outlets water over the spillway into a concrete/stone masonry drop inlet box immediately downstream of the spillway.

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Water is then conveyed from the drop inlet to a box culvert lined with a 48-inch diameter smooth bore pipe to the South Chuctanunda Creek.

The objective of this report is to provide an account of observations, findings, and recommendations associated with the safety inspection of the Mariaville Lake Dam.

V. DOCUMENT REVIEW:

Relevant documents reviewed prior to the safety inspection included plan and section drawings prepared in 1989 for repair work to the dam, plan and section drawings of the dam from the installation of the low-level outlet gate, The Engineering Assessment Report prepared by PRIME AE in 2015, DEC inspection reports dated 6/6/2019 and 4/2/2021, the I&M plan, and the EAP.

The plan and section drawings depict current features of the dam including a 28" low level outlet drain pipe, low level outlet gate valve that was abandoned and replaced with a low level outlet slide gate, drop inlet spillway, flashboards, 48" hdpe outlet pipe grouted inside of an existing box culvert, galvanized outlet end section, upstream concrete faces, chain-link fencing, Batter Street, guiderail, and downstream embankment.

The I&M Plan was reviewed and contains the required information specified in 6 CRR-NY 673.6 for I&M plans. The I&M plan details intervals at which inspections should be performed and when to complete maintenance. The plan also details operating procedures for the low-level outlet gate and flashboards to maintain the lake level in the fall, spring, and during major weather events.

The EAP was reviewed and contains the required information specified in 6 CRR-NY 673.7 for EAPs, including emergency notification, inundation mapping, procedures for implementing the EAP, and procedures for updating the EAP. The MCA should verify that all contacts listed in the notification flow chart are current.

VI. DAM SAFETY REGULATIONS:

The Mariaville Lake Dam is classified under the Dam Safety Regulation Hazard Classification (Part 673.5), as a small Class "C" or "High Hazard" Dam. The Dam Safety Regulations require the Owner's submission of an Inspection & Maintenance (I&M) Plan, Emergency Action Plan (EAP), and Annual Certification, safety inspections and engineering assessments. The requirements for the periodic dam safety inspections are as follows:

MARIAVILLE LAKE CIVIC ASSOCIATION
MARIAVILLE LAKE DAM SAFETY INSPECTION

§673.12 Safety Inspections

(a) The owner of a dam that has been assigned a hazard classification of class B or C shall undertake safety inspections on a regular basis, as shall be identified in the inspection and maintenance plan.

(b) The owner of a dam that has been assigned a condition rating of “unsafe" or "unsound" shall undertake safety inspections on a regular basis, as shall be identified in an inspection and maintenance plan, and upon the request of the department, in its discretion, based on its consideration of public safety and the specific characteristics of the dam and its location.

(c) Safety inspections shall be performed on behalf of the owner by an engineer, who shall document the results of each inspection in a safety inspection report, which shall be signed and sealed by the engineer.

(d) A safety inspection report shall include, but need not be limited to:

(1) document review. A review of all relevant documents, studies, plans, hazard classifications, photos, or any other information related to the dam and its appurtenant works, including the inspection and maintenance plan, safety inspection reports or other inspection reports generated since the last safety inspection, and the emergency action plan;

(2) visual inspection. The narrative results of a visual inspection of the dam, including the embankment, spillway, outlet, closure dikes and other appurtenant structures, focusing on initial and/or progressive signs of the manifestation of potential failure modes. Specific note shall be made as to whether any deficiencies reported in previous reports, and any corrective action required by the department, have been fully resolved and/or implemented. The report should include dated photographs of the specific observations made and any deficiencies or potential deficiencies identified during the visual inspection;

(3) review of data. A review and evaluation of any instrumentation data generated since the completion of the last safety inspection, and any recommendations for addressing gaps or other deficiencies or potential deficiencies in monitoring; and

(4) corrective action. Identification of deficiencies or potential deficiencies along with recommendations and a schedule for any corrective actions necessary to fully resolve the deficiencies or potential deficiencies, which recommendations may include

additional investigations, such as revised hydrologic and hydraulic analyses, stability analyses, or underwater inspections.

(e) Safety inspection reports shall be retained by the dam owner and kept in good order.

(f) The department may require any dam owner to furnish, upon reasonable notice and at the owner's sole expense, a copy of any or all safety inspection reports.

(g) The department may review any safety inspection report at any time to protect life, property or natural resources, may require additional information or clarification thereto, and/or may provide comments to be addressed in a revised safety inspection report upon a finding that the safety inspection, particularly the review of data, deficiency identification, and the recommendation(s) and schedule for corrective action therein, was not performed in compliance with this Part and/or generally accepted engineering practice in the field of dam design and safety. The owner shall revise the safety inspection report to fully incorporate and/or resolve the department's comments and resubmit it to the department within 60 days of the owner's receipt of the department's comments, unless another time frame is either requested by the owner and agreed to by the department, or imposed by the department in the interests of public safety for a dam that has a condition rating of "unsafe" or "unsound".

“All Class B and Class C dam owners shall retain at the dam owner’s sole expense, an engineer to perform periodic dam safety inspections and engineering assessments”. In accordance with the regulations, for a class C dam, dam safety inspections are required at a minimum frequency of two years and an Engineering Assessment is required at a minimum frequency of 10 years. “Within five years of the effective date of these regulations, the owners of Class C dams shall submit the first engineering assessment to the department. In those years where an engineering assessment is performed, a dam safety inspection will not be required”. The full requirements for the dam safety inspection and engineering assessments are detailed in the Dam Safety Requirements and written reports from the engineer are required to be submitted to DEC in compliance with those requirements.

VII. SAFETY INSPECTION:

Along with a review of the existing documentation of the dam, a visual on-site inspection of the Mariaville Lake Dam was performed on Friday, August 2, 2024, by Brett Newberry, P.E. of KB Engineering & Architecture, P.C. Seaway Diving & Salvage Company, Inc. also performed an underwater inspection of the dam face, low level outlet slide gate, and surrounding area on Friday June 21, 2024. The Inspection Report with field observation notes are attached in the Exhibits Section.

MARIAVILLE LAKE CIVIC ASSOCIATION
MARIAVILLE LAKE DAM SAFETY INSPECTION

The present condition of the concrete headwalls, headworks, spillway, drop inlet, shoreline abutting the dam, Batter Street, downstream embankment, outlet pipe, dam area in general, and immediate downstream water course were all reviewed in the field for any evidence of deficiencies.

A summary of the field observations are as follows:

The flashboards, which are connected to a rotating metal bracket system, were in the down position at the time of inspection. The lake level was approximately 1-2" beneath the invert of the spillway at the time of the visit. The concrete headwalls appear to be structurally sound with no visible settlement, tipping, or major cracking. Some minor cracking of the headwall and spalling and cracking of the concrete structure surrounding the abandoned low level outlet gate valve were observed. There is a loose piece of concrete at the corner of the structure where the slide gate is mounted. Some light vegetation/grass is starting to grow in some of the minor cracks of the headwall/spillway structure. The gunite/shotcrete overlay covering the original stone/masonry walls of the drop inlet is in good condition. The low-level outlet looks to be in good condition. There was no flow over the spillway, however, there was flow into the drop inlet spillway from beneath the eastern dam abutment. The low-level outlet gate could not be observed because it is submerged beneath the lake, however, the gate was recently exercised and operates as intended. There are (2) lag bolts missing from the slide gate frame that should be replaced.

The roadway pavement and shoulders are in good shape with no visible sinkholes, deterioration, erosion or settlement. A sinkhole was discovered in 2023 and a patch repair was completed to the eastbound travel lane of Batter St. The sinkhole will be discussed in further detail in the upcoming Engineering Assessment Report.

The downstream embankment contains thick vegetation and was inaccessible at the time of inspection, however, no evidence of wet spots, settlement, sloughs, animal burrows, sinkholes, seepage, or erosion were observed. The MCA advises that they do not own the property containing the slope, therefore removal of vegetation will need to be performed by the respective property owner.

The stone lined swale down the slope of the downstream embankment was recently repaired to add stone to cover previously exposed geotextile fabric, however, this swale was not visible due to vegetative growth.

The outlet pipe from the drop inlet spillway and low level outlet was not accessible due to the vegetative growth mentioned above. From what could be observed, the pipe appears to be in good condition. The steel end section shows some deterioration and rust, however, there does not appear to be any flow restriction. The only water passing through the pipe appeared to be

about 1”-2” of flow in the bottom of the pipe from flowing into the drop inlet. The outlet pool at the downstream end of the outlet pipe showed no visible signs of boils, turbidity, piping, or erosion. There were some downed trees across the outlet channel downstream from the outlet pipe.

To the east, an existing building forms the abutment and appears to be structurally sound. To the west, the top of the concrete wall batters down approximately 12” in the last 6’. There does not appear to be any evidence of overtopping of the headwall or flow around the east end. The abutment to the west is adjacent to a concrete retaining wall and the shoreline appears relatively stable with some erosion from wave action of the lake.

No whirlpools or unusual water patterns were visible at the time of the visit.

The dive inspection found that the dam abutments were in excellent condition beneath the water surface with little to no cracking. There was minor efflorescence observed in minor cracks above the water surface. Minor evidence of concrete deterioration from freeze thaw was observed in the splash zone. The retaining wall to the west of the dam, and not a part of the dam structure, was observed to be in poor condition, cracked, and leaning towards the lake. The divers also exercised the low level outlet slide gate. There were a total of four voids between approximately ten feet and 30 feet from the face of the dam observed.

To provide a visual record of the condition of the dam at the time of the visit, photographs taken are included in the Exhibits.

VIII. CONCLUSIONS AND RECOMMENDATIONS:

As a result of the dam safety inspection, the dam appears overall to be in good condition with a few relatively minor deficiencies that should be addressed. No conditions were visible at the time of the visit that would indicate an immediate or imminent danger or safety concern for the public.

Review on a regular basis, and keep current, the Emergency Action Plan with all associated personnel. Know and follow the procedures and precautions described in the Emergency Action Plan.

The MCA inspects the dam at regular intervals as well as following any major weather event. Any changes should be reported and reviewed immediately for the potential of developing into a dangerous situation.

The minor deficiencies noted during this dam safety inspection should be addressed as follows:

MARIAVILLE LAKE CIVIC ASSOCIATION
MARIAVILLE LAKE DAM SAFETY INSPECTION

1. Repair the spalled areas of the concrete structure encasing the abandoned low level outlet gate valve. A permit for these repairs was obtained October 16, 2023, and repairs are planned to take place in late 2024.
2. Repair spalled area above the spillway on the eastern side of the dam.
3. Seal cracks on headwall structure, including crack above drainage slot in the back of the headwall, and crack on the eastern corner of the headwall at the spillway.
4. Replace (2) lag bolts missing from slide gate frame.
5. Remove vegetation from cracks on upstream face of dam and seal cracks to prevent future vegetative growth and the widening of cracks.
6. Mow the downstream embankment to prevent further vegetative growth. As the downstream embankment property is not owned by the MCA, the property owner should maintain the embankment.

Although these repairs may be considered maintenance of the dam, all repairs and construction activities performed on the dam should be reviewed by NYSDEC to determine if permits are required.

EXHIBIT A
INSPECTION REPORT

KB Engineering & Architecture, PC

KB Engineering & Architecture, P.C.
100 Great Oaks Boulevard, Suite 114
Albany, NY 12203
P: 1.833.723.4768

Mariaville Lake Dam
Safety Inspection

Inspection Date: Friday, August 2, 2024, 9:00 AM

Re: Mariaville Lake Dam
Visual Observation Notes

Inspection By: Brett Newberry, P.E., PRIME AE

Field Observation Notes:

1. Lake water level approximately 1”-2” below invert of spillway.
2. No unusual water movement or whirlpools were visible along upstream face of headwall, abutments, or shoreline.
3. Upstream face of concrete headwall that is visible above the water is in good condition with minor cracking.
4. Some minor vegetation observed growing between minor cracks in the concrete headwall. Vegetation removal began after inspection.
5. Some spalling and cracking are evident on the abandoned gate valve structure and on the eastern spillway channel wall. Per Owner, concrete repairs to this structure are planned for September 2024.
6. Concrete structure beneath the abandoned gate valve structure was exposed during inspection. Cracks present at corners of structure, and concrete is loose. Per Owner, this structure is also planned to be repaired in September 2024.
7. Some cracking observed behind metal plates lining spillway between concrete headwall and grout behind plates.
8. Flashboards are in down position. Water is beneath the invert of the spillway and no water was present at the location of the flashboards.
9. Low level outlet pipe is inaccessible, however, pipe appears to be in good condition.
10. Low level outlet gate could not be observed through water, however, portions above water appear to be in good condition. The gate valve was recently exercised and operates satisfactorily.
11. Shotcrete on the walls of the drop inlet and is in good condition. Water is seeping into the drop inlet from the east, and appears to be at a flow consistent with flow observed in previous inspections.
12. No leakage, boils, erosion, or seepage was evident along the downstream side of the headwall, along the road, on the downstream embankment slopes, or along the outlet pipe. The road is patched behind the western end of the spillway from repairs to a sinkhole discovered in 2023.
13. Downstream embankment slope was inaccessible due to vegetative growth. Slopes in need of mowing and vegetative removal, however there was no evidence of erosion, sloughing, slips, wet areas, seepage, boils, piping, or water damage. Note downstream embankment is not owned by MCA

KB Engineering & Architecture, P.C.
100 Great Oaks Boulevard, Suite 114
Albany, NY 12203
P: 1.833.723.4768

Mariaville Lake Dam
Safety Inspection (Continued)

Inspection Date: Friday, August 2, 2024, 9:00 AM

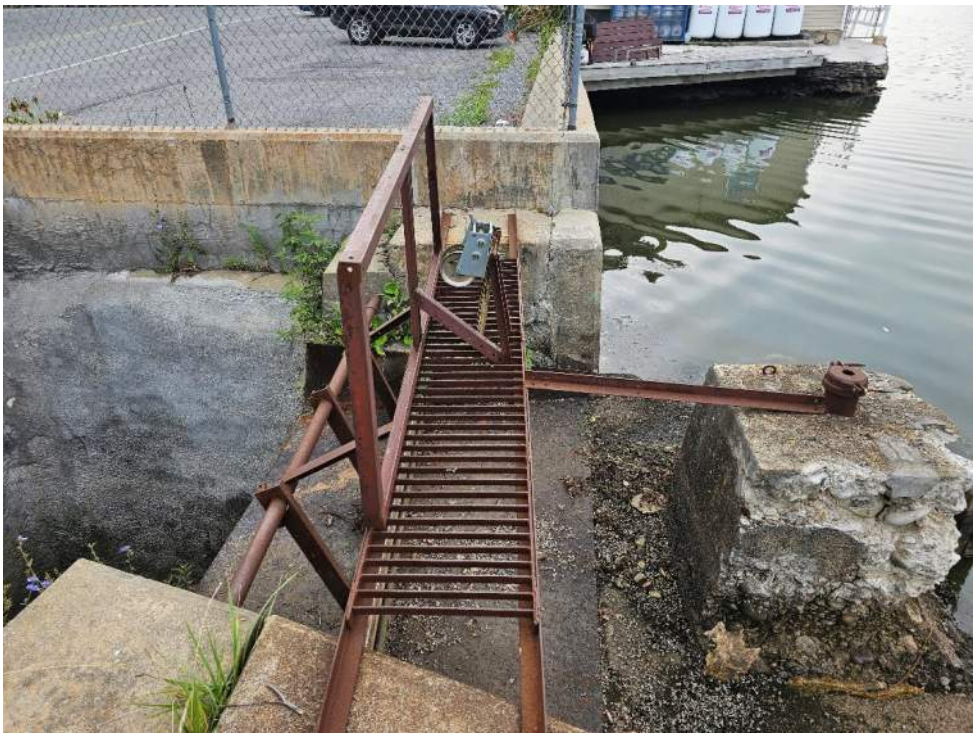
14. Rock lined swale on downstream embankment takes surface drainage from Batter Street and directs flow to stream at downstream end of outlet pipe. County recently added additional stone to outlet swale to cover geotextile fabric. Swale is overgrown with vegetation. No other erosion was evident along swale.
15. No evidence of sediment, turbidity, boils, or unusual flows were visible in water pool in stream below outlet pipe.
16. 48" HDPE outlet pipe was inaccessible from the downstream end due to vegetation. Where visible, pipe is in good condition with no visible leaks, damage, or deformations.
17. Overall dam appears to be in good condition with some minor deficiencies noted.
18. Downed trees observed across the outlet channel downstream from the dam.

EXHIBIT B
INSPECTION PHOTOGRAPHS

Front (Lakeside) of Headwall Looking West

Front (Lakeside) of Headwall Looking East

Back of Headwall, Looking East



Spillway/Headworks Looking East

Spillway/Flashboards – In Lowered Position

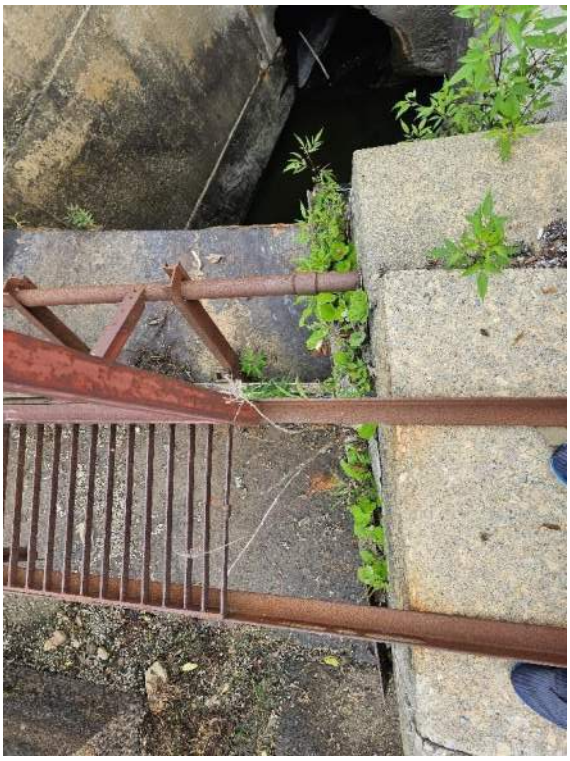
Upstream Face of Drop Inlet

Downstream Face of Drop Inlet – Crack Above Drainage Slot

Auxiliary Spillway Looking West

Abandoned Low Level Outlet Structure with Face Mounted Gate Frame and Cracked Concrete Structure

Spalled Concrete at East Spillway Wall and Abandoned Low Level Outlet Valve



Metal Plate At Spillway Wall

Downstream Embankment Looking North

Outlet Pipe Looking South

Outlet Channel Looking West

Backside of Dam Looking South

EXHIBIT C
NEW YORK STATE INVENTORY SHEET

NEW YORK STATE
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

New York State Inventory of Dams

Name of Dam: Mariaville Lake Dam
State ID: 189-0224

Hazard Code: C
See below for hazard code definition

Year Completed: 1925
Most Recent Inspection: 6/25/2010

Location Information:				
County	**Municipality**	**River or Stream**	**Latitude**	**Longitude**
Schenectady	Not Found	TR-SOUTH CHUCTANUNDA CREEK	42° 49' 41.002" N	74° 8' 11.0" W

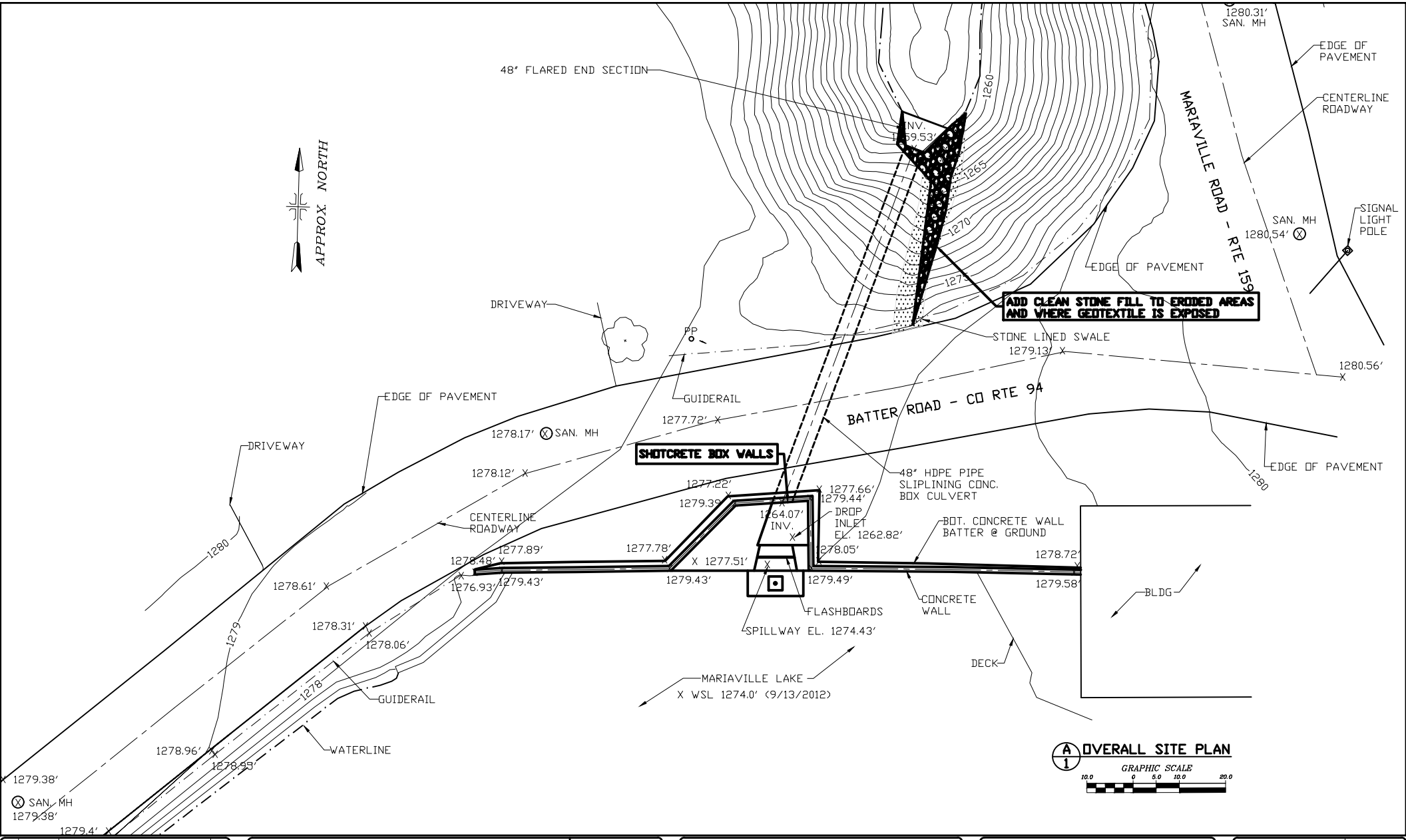
Type:	
Type of Construction	**Purpose**
RE - Earth, MS - Masonry	Recreation

Technical Information:	
Federal ID Number	NY00169
Dam Length (feet)	136
Dam Height (feet)	16
Spillway Width (feet)	29
Maximum Discharge (cubic feet per second)	0
Maximum Storage (acre-feet)	1102
Normal Storage (acre-feet)	1102
Reservoir Surface Area (acres)	201
Drainage Area (square miles)	2.85
Basin	MOHAWK
Date of Data Update	11/17/2010

Note -- The Hazard Code denotes the downstream hazard potential in the event of a dam failure:

C = High Hazard
B = Intermediate Hazard
A = Low Hazard

EXHIBIT D
OVERALL SITE PLAN



A1 OVERALL SITE PLAN

GRAPHIC SCALE

10.0 0 5.0 10.0 20.0

NO.	DATE	REVISION	BY
00	09/12	ORIGINAL ISSUE	ATB

KB Engineering & Architecture, P.C.

100 Great Oaks Blvd | Suite 114 | Albany, New York 12203
Ph: 1-833-723-4768
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PROJ. ENGR.: ATB | DRAWN BY: ATB | CHECKED BY: JMM

MARIAVILLE CIVIC ASSOCIATION
SCHENECTADY COUNTY, NY

MARIAVILLE LAKE DAM

SHEET TITLE:

OVERALL SITE PLAN

SCALE: AS SHOWN

FILE NO.: 76-0701-005

DATE: SEPTEMBER 2012

SHEET NO.: A1

EXHIBIT E
DIVE INSPECTION REPORT

Seaway Diving & Salvage Co Inc.
Dive Report

Prepared For: Mariaville Lake Assoc.
Prepared By: Jay Sterling **Date:** 21JUN2024

Scope of Work: Inspect Western concrete wall and embankment to the East through spillway and valve area to the extreme Eastern wall termination. Inspect toe of dam for scour, breaks, leaks, spalling or shifting. Inspect valve structure to include stem, bearings, hardware, guides, gate, rack & sill. Remove debris/sediment that may obstruct operation of valve. Operate valve.

Diver: Jay Sterling

Condition: Overall condition of the concrete of the Western retaining wall was degraded. The wall was observed to be shifting towards the lake as well as cracked and separated at several points. These cracks were determined to run completely through the sections of concrete. Scour along the interface between bottom surge stone and the vertical concrete wall averages between 1-4" with a depth of ~1-2". Several areas of material loss were noted at the bottom termination of the visible separations in the concrete at the surface. The first void begins approximately 10 feet from the Western most point of the retaining wall and measures ~18"w x18"H x 10"D. The second void begins approximately 20 feet from the Western extremity of the retaining wall and measures ~10"W x10"H x 6"D. The third void begins approximately 26 feet from the Western extremity of the retaining wall and measures ~8"W x 2'H x10"D. The fourth void begins approximately 30 feet from the Western extremity of the retaining wall and runs the entire remaining length of the retaining wall until the cold joint with the spillway wall face. The average height of the void is ~10"H with a depth of ~10-12". Minor loss of the larger aggregate in the concrete of the retaining wall was noted. The Western wingwall of the spillway was observed to be in overall excellent condition with little to no cracking. Minor efflorescence was observed above the waterline in hairline cracks. Minor evidence of freeze/thaw effect was observed within the "splash zone". The valve structure was observed to be in a mild state of decay with one large corner piece having delaminated as well as much of the surface showing large aggregate with little grout. Structure is overall stable at this time. The Eastern wingwall and retaining wall were observed to be in excellent condition with no notable defects or shifting. The concrete footer of the dam is exposed but protected by guardian stone on the Western side of the spillway with several vertical pipes exposed approximately every 4 feet. The footer on the Eastern side is only exposed for the first 2' from the valve structure extending East and then is 100% covered in guardian stone.

Layout: Poured concrete footer approximately 12" in height and 2' in width supporting a approximately 4' vertical poured dam face and retaining walls. Centralized concrete spillway with low-level outlet pipe and gate structure (sizes referred to in report dated 14NOV2013).

Actions Taken: Video inspection of overall condition and disposition of concrete surfaces and bottom interfaces. Inspection of all hardware and mounted operating gear (ie: valve, stem, guides, rack). Light cleaning/clearing of area directly in front of low-level outlet valve. Operated valve to maximum of 6" and observed it close with zero notable flow.

Seaway Diving & Salvage Co Inc.
Dive Report

Prepared For: Mariaville Lake Assoc.
Prepared By: Jay Sterling **Date:** 21JUN2024

Conclusion: Despite degraded Western retaining wall, the overall condition of the dam and adjoining Eastern retaining wall is good with no major defects or deformities noted. No visible shifting, settling or scouring is present and the control valve was found to be in good condition and working order.

SEAWAY DIVING & SALVAGE CO., INC.

10 Guideboard Rd., Waterford, NY 12188 **518/238-2632**
Fax: **518/238-2834**
www.seawaydivers.com

* Underwater Video Inspection * Construction * Cutting & Welding *
* Hydro & Dam Maintenance * Inspection & Cleaning of Potable Water Tanks, Intakes & Pipelines *
* Air Lift & Pumping Bottom Materials * Concrete Repair, Cutting, Drilling & Flexible Forms *
* Side Scan Sonar Bottom Surveys *

Day FRI Date JUNE 21 2024 Day # 1
Dive Supervisor Don Cantino
Diver JAY Sterling
Tender RYAN Scorz

Project ID
Customer MaRiaville Lake
Address
Phone / Job #
Customer Representative Bob
Project Location MARIAVille DAM
Project INSPECTION

Arrive Job Site 9:00 Depart Job Site 11:00
Water Depth 10' Weather Conditions CLEAR
Water Temp 70° Air Temp 90°
Visibility 6'-10' Current —
Diving Mode Surface Supplied
Platform SHORE
Body of Water MARIAVille LAKE

Equipment

2-sets Dive Gear
U/W video

Group JAY		Group	
LS	8:40	LS	
RS	9:30	RS	
LS		LS	
RS		RS	

Safety Toolbox Meeting

Topic
Attended by

TIME **DESCRIPTION**

8:00 Arrive onsite setup, Review Job + Safety Meet with customer Rep

8:40 Diver JAY LS. Diver inspected dam starting on the west wing wall. This wall is cracked + broken + tipping slightly towards the lake. Mild scour was noted. The new west wall + footer are in good shape. The spillway concrete is in good shape. The original valve pad AS4AJ is in the ice thaw zone and the top is beginning to break up with the top anchors of the valve guides starting to get loose. The gate looks good and was operated while the diver could observe, opened to approx. 6", cleared out soft silt and closed while being observed it functions as it should. The East wall leading to the stone is in good sound shape. No scour or damage.
Dam appears in Excellent shape with no visible leaks, scour, or damage.

9:30 Diver RS

Break down

Depart

Customer Signature

EXHIBIT D
WATERSHED MAP

NO.	DATE	REVISION	BY
00	09/2024	ORIGINAL ISSUE	BSN

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DRAWN BY: BSN
CHECKED BY: DPC

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MARIAVILLE CIVIC ASSOCIATION
SCHENECTADY COUNTY, NY

MARIAVILLE LAKE DAM

SHEET TITLE:
WATERSHED MAP

SCALE: AS SHOWN
FILE NO.: 240647-015
DATE: SEPTEMBER 2024
SHEET NO.: 3

EXHIBIT E
SPILLWAY CAPACITY H&H ANALYSIS

Mariaville Lake Dam
Spillway Flow Analysis

John M. Mcdonald Engineering, P.C.

9/27/2024

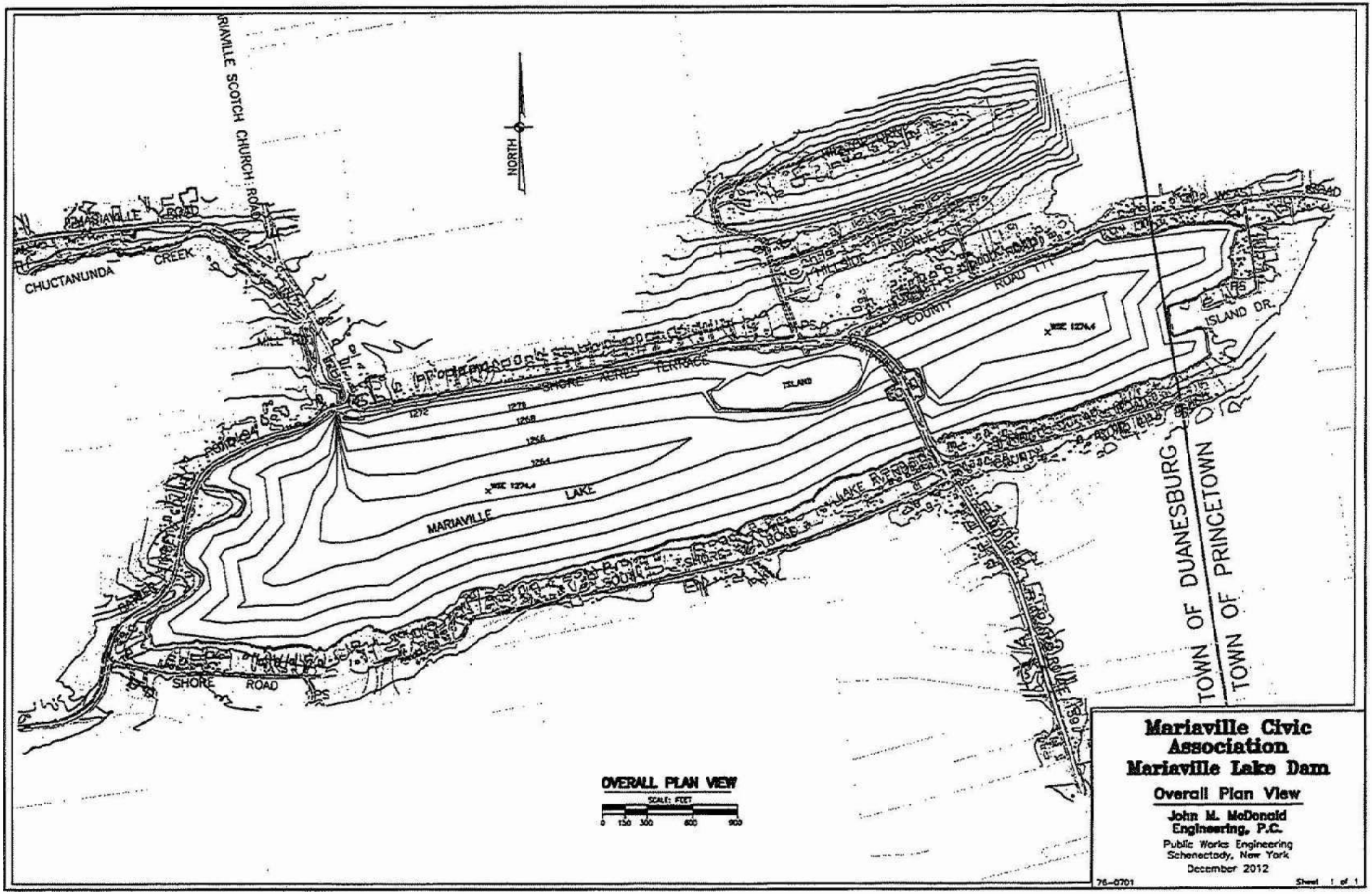
Normal Lake Level, Spillway Crest (USGS)	1274.43	ft, USGS Elevation
Flashboard Height (In Place)	1.08	ft
Water Level @ Top of Flashboards (USGS)	1275.51	ft, USGS Elevation
Water Level @ Top of Abutment Walls (USGS)	1279.43	ft, USGS Elevation
Surface Area of Lake @ Normal Level, Spillway Crest (An)	180	acres
Lake Storage Volume @ Normal Lake Level (Vn)	981	acre-ft
Lake Volume in Cubic Feet @ Normal Lake Level (Vn)	42,732,360	cf
Surface Area of Lake @ Top of Abutment Walls (An)	195	acres
Lake Storage Volume @ Top of Abutment Walls (Vf)	1716	acre-ft
Lake Volume @ Top of Abutment Walls (Vf)	74,748,960	cf
Water Elevation (USGS)	1275.51	ft, USGS Elevation
Spillway Width (Ls)	7	ft
Water Depth (Hs)	3.92	ft
Spillway Weir Coefficient (Cs)	3.2	Assume sharp crested weir
Auxillary Spillway Elevation (USGS)	1277.51	ft, USGS Elevation
Aux. Spillway Depth From Top of Aux. Spillway to Top of Abutment Walls (Has)	1.9	ft
Auxillary Spillway Width (Las)	13.6	ft
Auxillary Spillway Coefficient (Cas)	2.8	Assume broad crested weir
Flood Volume, No Inflow	735.0	acre-ft
75% Flood Volume (acre-ft)	551.3	acre-ft
75% Flood Volume (cubic feet)	24,012,450	cf
Spillway Flow Required to Evacuate 75% Flood Volume in 48 hrs	139	cfs average
Water Depth After 75% Flood Volume Evacuated	1.0	ft

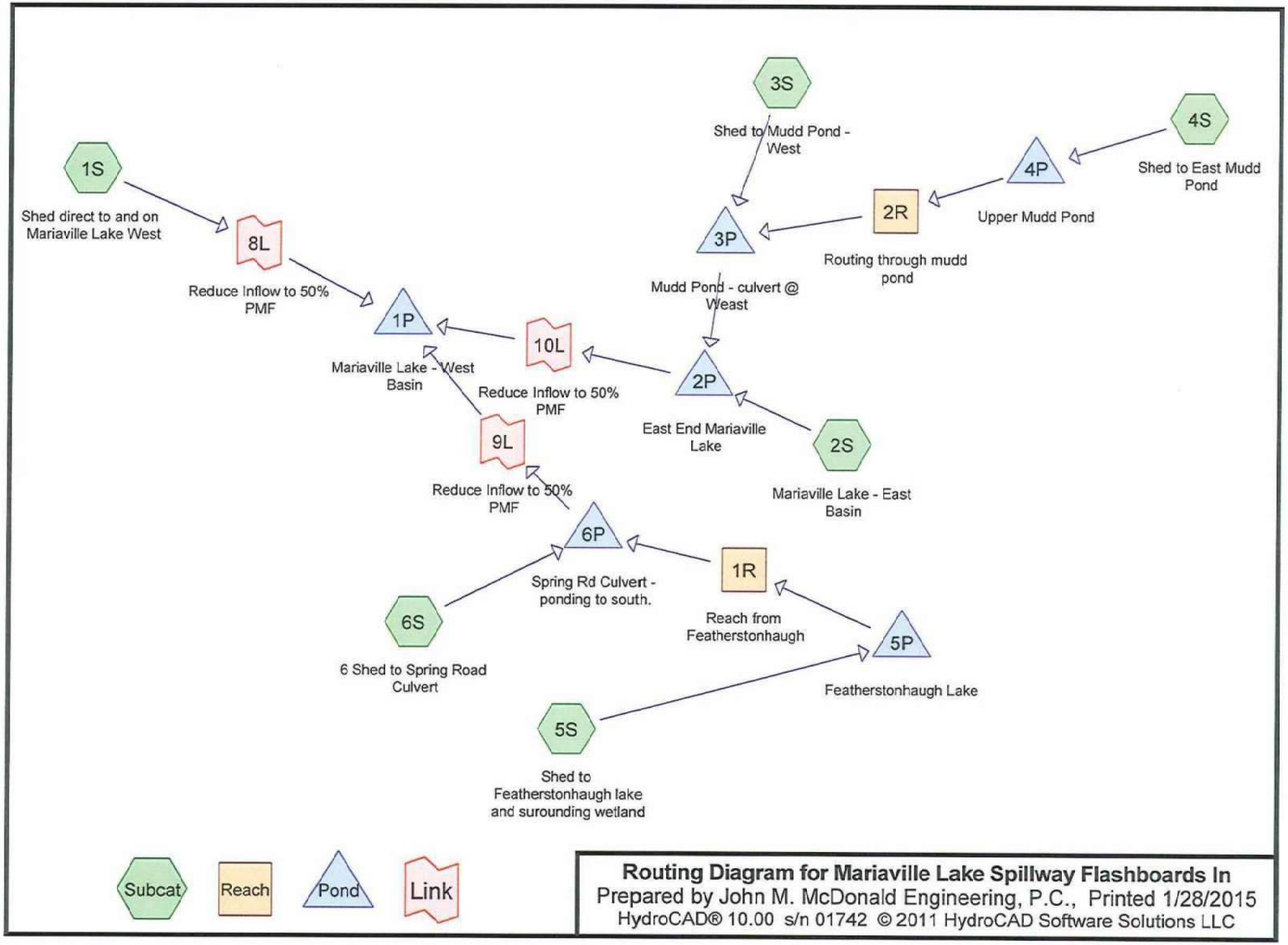
Q=(Cw)x(L)x(H)^1.5

Determine maximum flow over spillway & auxillary spillway w/ water level @ top of abutments

Qs	=	174	cfs, flow over spillway
Qas	=	101	cfs, flow over auxillary spillway
Qt	=	275	cfs, total flow over spillways (spillway capacity)
Q75%	=	22	cfs, after 75% flood volume evacuated
Qaverage	=	148	cfs, average for 75% flood volume evacuated, no inflow

Conclusion: Spillway has capacity to evacuate 75% of the flood volume, with no inflow, within 48 hrs.


NORTH
MARIAVILLE SCOTCH CHURCH ROAD
MARIAVILLE ROAD
CHUCTANUNDA CREEK
SHORE ACRES TERRACE
ISLAND
LAKE
MARIAVILLE
SHORE ROAD
COUNTY ROAD 111
ISLAND DR.
TOWN OF DUANESBURG
TOWN OF PRINCETOWN
OVERALL PLAN VIEW
SCALE: FEET
0 150 300 600 900
Mariaville Civic Association
Mariaville Lake Dam
Overall Plan View
John M. McDonald Engineering, P.C.
Public Works Engineering
Schenectady, New York
December 2012
76-0701
Sheet 1 of 1



Routing Diagram for Mariaville Lake Spillway Flashboards In
Prepared by John M. McDonald Engineering, P.C., Printed 1/28/2015
HydroCAD® 10.00 s/n 01742 © 2011 HydroCAD Software Solutions LLC

Summary for Pond 1P: Mariaville Lake - West Basin

Device #1 (13" flashboards) set at inv. elevation 1275.51'.
Normal WSL set at flashboard inv. elevation of 1275.51'.
Both spillways routed to culvert.
Flood elevation set at 1279.39'.

Inflow Area = 2,010.510 ac, 17.90% Impervious, Inflow Depth > 4.99" for 6-hr PMF event
Inflow = 5,192.05 cfs @ 3.23 hrs, Volume= 835.430 af
Outflow = 241.63 cfs @ 9.60 hrs, Volume= 381.905 af, Atten= 95%, Lag= 382.2 min
Primary = 241.63 cfs @ 9.60 hrs, Volume= 381.905 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,279.29' @ 9.60 hrs Surf.Area= 153.177 ac Storage= 539.595 af
Flood Elev= 1,279.39' Surf.Area= 153.856 ac Storage= 553.870 af

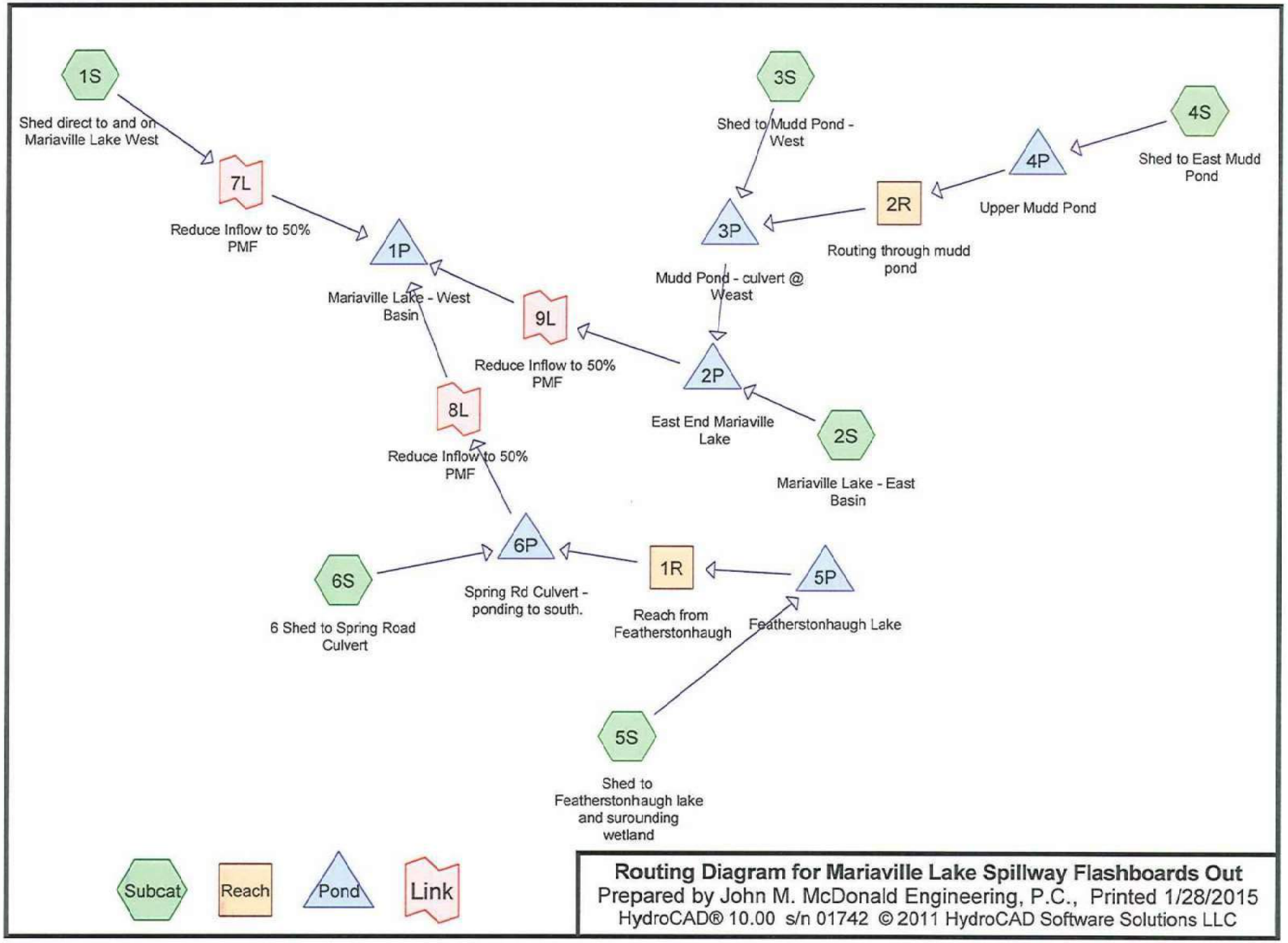
Plug-Flow detention time= 642.0 min calculated for 381.905 af (46% of inflow)
Center-of-Mass det. time= 401.1 min (835.4 - 434.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,275.51'	1,484.698 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,275.51	127.500	0.000	0.000
1,280.00	158.000	640.948	640.948
1,285.00	179.500	843.750	1,484.698

Device	Routing	Invert	Outlet Devices
#1	Device 3	1,275.51'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.0' Crest Height
#2	Device 3	1,277.51'	**12.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Primary	1,264.07'	**50.4" Round Culvert** L= 82.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,264.07' / 1,259.03' S= 0.0615 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 13.85 sf

Primary OutFlow Max=241.63 cfs @ 9.60 hrs HW=1,279.29' (Free Discharge)
└**3=Culvert** (Inlet Controls 241.63 cfs @ 17.44 fps)
  ├**1=Sharp-Crested Rectangular Weir** (Passes < 214.33 cfs potential flow)
  └**2=Broad-Crested Rectangular Weir** (Passes < 74.95 cfs potential flow)



Routing Diagram for Mariaville Lake Spillway Flashboards Out
Prepared by John M. McDonald Engineering, P.C., Printed 1/28/2015
HydroCAD® 10.00 s/n 01742 © 2011 HydroCAD Software Solutions LLC

Summary for Pond 1P: Mariaville Lake - West Basin

Device #1 (w/o flashboards) set at inv. elevation 1274.43.
Normal WSL set at elevation 1274.43.
Both spillways routed to culvert.
Flood elevation set at 1279.39'.

Inflow Area = 2,010.510 ac, 17.90% Impervious, Inflow Depth > 4.99" for 6-hr PMF event
Inflow = 5,135.82 cfs @ 3.23 hrs, Volume= 835.305 af
Outflow = 231.98 cfs @ 11.37 hrs, Volume= 346.538 af, Atten= 95%, Lag= 488.5 min
Primary = 231.98 cfs @ 11.37 hrs, Volume= 346.538 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,278.26' @ 11.37 hrs Surf.Area= 148.490 ac Storage= 547.195 af
Flood Elev= 1,279.39' Surf.Area= 154.660 ac Storage= 708.040 af

Plug-Flow detention time= 654.4 min calculated for 346.538 af (41% of inflow)
Center-of-Mass det. time= 400.7 min (843.3 - 442.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,274.43'	1,638.867 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,274.43	127.500	0.000	0.000
1,280.00	158.000	795.117	795.117
1,285.00	179.500	843.750	1,638.867

Device	Routing	Invert	Outlet Devices
#1	Device 3	1,274.43'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.0' Crest Height
#2	Device 3	1,277.51'	**12.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Primary	1,264.07'	**50.4" Round Culvert** L= 82.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,264.07' / 1,259.03' S= 0.0615 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 13.85 sf

Primary OutFlow Max=231.98 cfs @ 11.37 hrs HW=1,278.26' (Free Discharge)
└**3=Culvert** (Inlet Controls 231.98 cfs @ 16.74 fps)
  ├**1=Sharp-Crested Rectangular Weir** (Passes < 219.13 cfs potential flow)
  └**2=Broad-Crested Rectangular Weir** (Passes < 20.82 cfs potential flow)

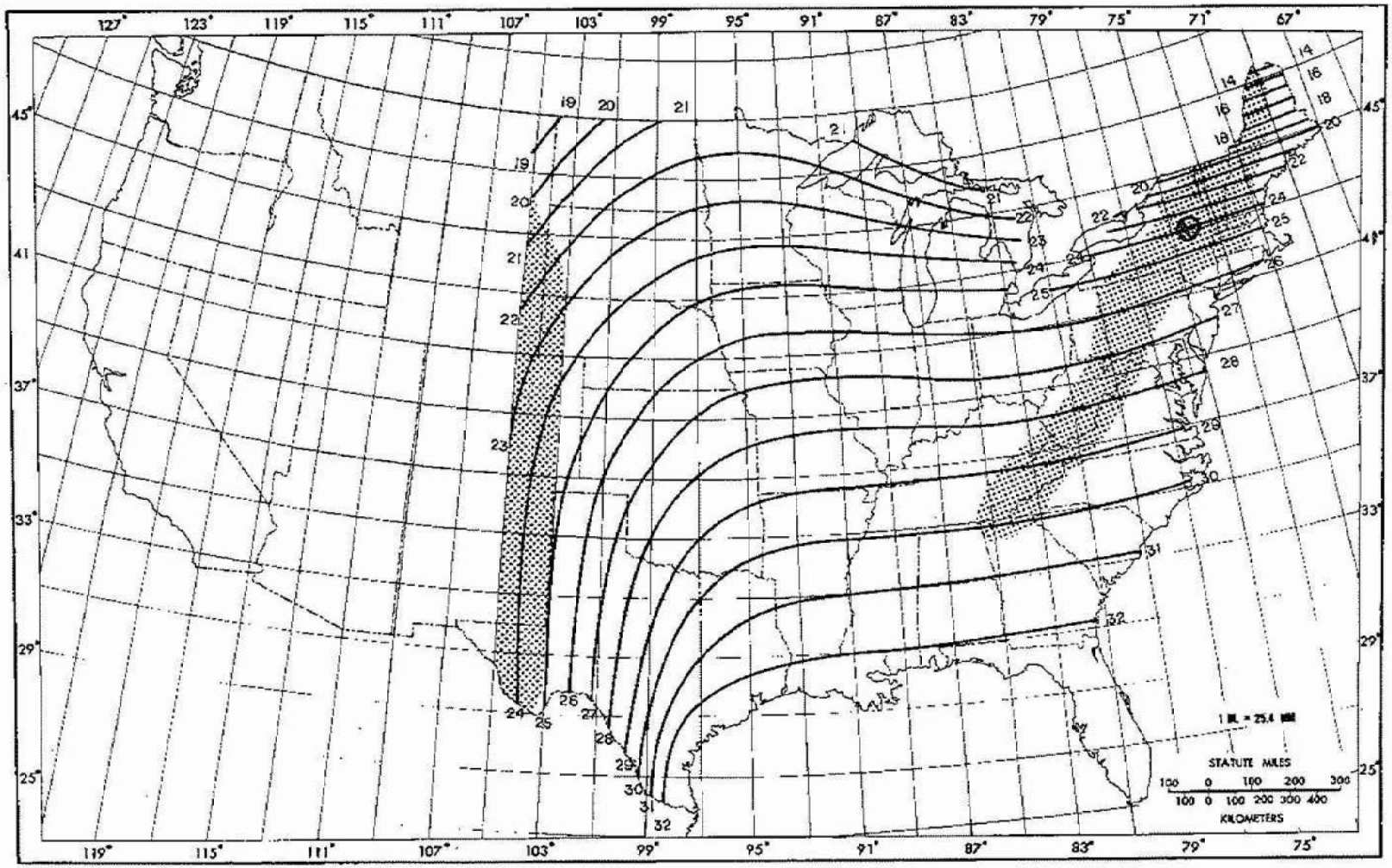


Figure 18.--All-season PMP (in.) for 6 hr 10 mi^2 (26 km^2).

EXHIBIT F
LOW LEVEL OUTLET HYDRAULIC ANALYSIS

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	1,263.20	1,263.20	11.0	0.0000	0.012	28.0	0.0	0.0
2	1P	1,264.07	1,259.53	82.0	0.0554	0.012	48.0	0.0	0.0

Summary for Pond 1P: Mariaville Lake

[44] Hint: Outlet device #1 is below defined storage

Inflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Outflow	=	57.54 cfs @	0.00 hrs,	Volume=	933.354 af, Atten= 0%, Lag= 0.0 min
Primary	=	57.54 cfs @	0.00 hrs,	Volume=	933.354 af

Routing by Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.05 hrs
Starting Elev= 1,274.40' Surf.Area= 7,845,924 sf Storage= 40,936,393 cf
Peak Elev= 1,274.40' @ 0.00 hrs Surf.Area= 7,845,924 sf Storage= 40,936,393 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

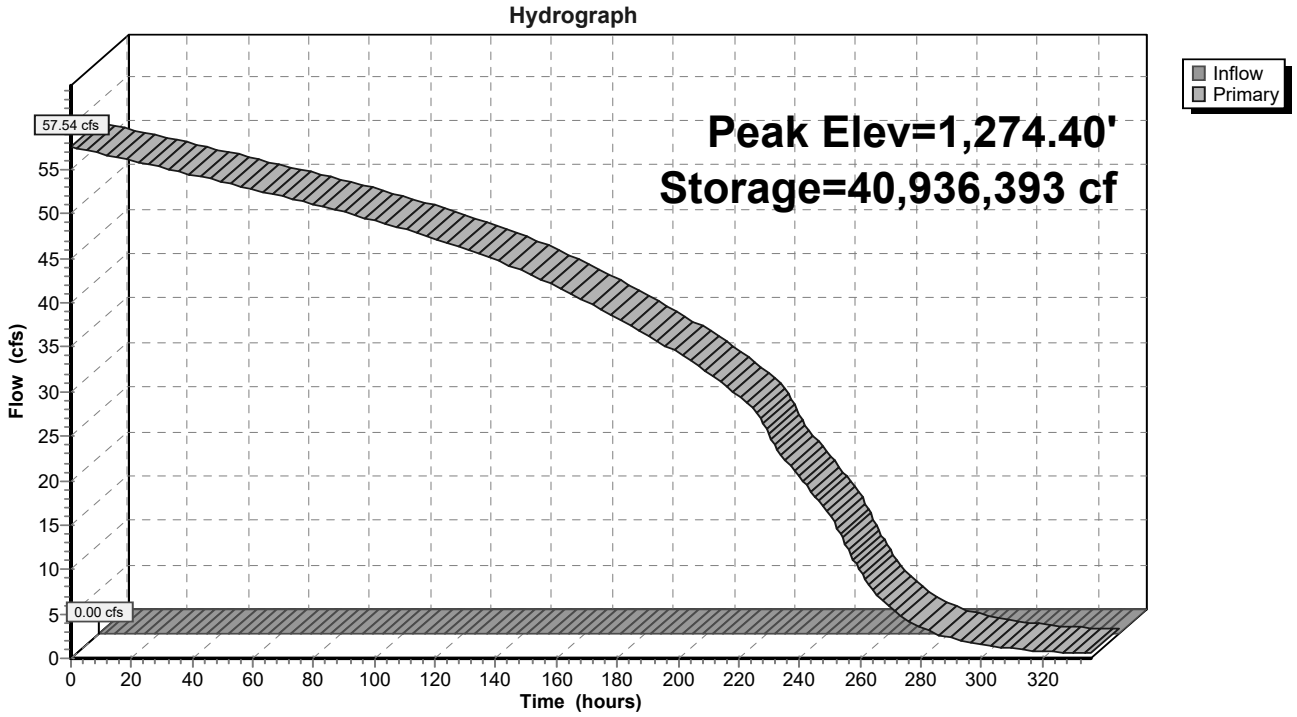
Volume	Invert	Avail.Storage	Storage Description
#1	1,263.50'	40,936,393 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,263.50	0	0	0
1,264.00	462,924	115,731	115,731
1,266.00	1,516,332	1,979,256	2,094,987
1,268.00	2,803,670	4,320,002	6,414,989
1,270.00	3,780,326	6,583,996	12,998,985
1,272.00	6,700,897	10,481,223	23,480,208
1,274.40	7,845,924	17,456,185	40,936,393

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,263.20'	**28.0" Round Culvert** L= 11.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 1,263.20' / 1,263.20' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.28 sf
#2	Primary	1,264.07'	**48.0" Round Culvert** L= 82.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,264.07' / 1,259.53' S= 0.0554 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 12.57 sf

Primary OutFlow Max=57.54 cfs @ 0.00 hrs HW=1,274.40' (Free Discharge)
↑**2=Culvert** (Passes 57.54 cfs of 174.63 cfs potential flow)
↑**1=Culvert** (Inlet Controls 57.54 cfs @ 13.46 fps)

Pond 1P: Mariaville Lake



Hydrograph for Pond 1P: Mariaville Lake

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	**0.00**	**40,936,393**	**1,274.40**	**57.54**
10.00	0.00	38,878,511	1,274.14	56.78
20.00	0.00	36,848,334	1,273.87	56.00
30.00	0.00	34,846,322	1,273.60	55.22
40.00	0.00	32,872,957	1,273.34	54.41
50.00	0.00	30,928,732	1,273.07	53.60
60.00	0.00	29,014,165	1,272.80	52.77
70.00	0.00	27,129,788	1,272.53	51.92
80.00	0.00	25,276,161	1,272.27	51.06
90.00	0.00	23,453,858	1,272.00	50.18
100.00	0.00	21,663,733	1,271.72	49.26
110.00	0.00	19,907,628	1,271.43	48.29
120.00	0.00	18,188,000	1,271.13	47.24
130.00	0.00	16,507,850	1,270.80	46.09
140.00	0.00	14,870,973	1,270.45	44.83
150.00	0.00	13,282,378	1,270.07	43.40
160.00	0.00	11,748,423	1,269.66	41.80
170.00	0.00	10,273,661	1,269.24	40.11
180.00	0.00	8,861,659	1,268.81	38.31
190.00	0.00	7,516,513	1,268.38	36.39
200.00	0.00	6,242,976	1,267.94	34.33
210.00	0.00	5,047,190	1,267.48	32.06
220.00	0.00	3,938,266	1,267.00	29.49
230.00	0.00	2,939,180	1,266.50	25.20
240.00	0.00	2,125,682	1,266.02	20.60
250.00	0.00	1,465,768	1,265.55	16.00
260.00	0.00	998,689	1,265.15	9.73
270.00	0.00	730,181	1,264.88	5.63
280.00	0.00	570,484	1,264.70	3.45
290.00	0.00	469,874	1,264.58	2.24
300.00	0.00	402,908	1,264.49	1.52
310.00	0.00	356,251	1,264.42	1.10
320.00	0.00	322,538	1,264.37	0.80
330.00	0.00	297,167	1,264.33	0.62

EXHIBIT G
STABILITY ANALYSIS

Mariaville Civic Association
Mariaville Lake Dam
Engineering Assessment
September 26, 2024

GENERAL INFORMATION: Evaluate Existing Concrete Gravity Block Shaped Structure with Weir Spillway

SITE SPECIFIC VARIABLES	VALUES		COMMENTS
Length of Dam Crest Used in Analysis	8.0	ft	Width of Weir
Crest Elevation	1274.4	ft	
Dam Height @ Crest	11.6	ft	Maximum dam height
Dam Width @ Crest	11.0	ft	
Dam Width @ Base	11.0	ft	
Upstream Key Width @ Base	11.0	ft	
Monolithic Side Connection Width	2.0	ft	Spillway Structure is monolith with Sidewalls
Upstream Key Depth	1.5	ft	
Height of Water Above Crest @ SDF	5.0	ft	50% PMF
HWL @ SDF = Height of Dam + Water Over	16.6	ft	50% PMF
TWL @ SDF	4	ft	50% PMF, assumed conservative
Normal TWL	0	ft	No tailwater @ normal HWL
Rock Anchor Size	-	in	No Rock Anchors
Rock Anchor Area	0	sq. inch	
Rock Anchor Spacing	0	ft	
Dowel Bar Size	-	in	No Dowels
Dowel & Rock Anchor Bar Yield Stress	60	ksi	
Dowel Bar Area	0	sq. inch	
Dowel Bar Spacing	3	ft	
Shear Strength of Concrete Key	3500	psi	
Shear Key Area	1728	sq. inch	
Silt Depth Upstream	0	ft	
Ice Force Applied to Crest	5	kips/ft	
Water - Unit Weight	62.4	lb/cu. ft.	
Concrete/Stone Masonry - Unit Weight	150.0	lb/cu. ft.	
Silt -Unit Weight Submerged	80.0	lb/cu. ft.	
Friction Coefficient Along Base	0.4		Assumed concrete on gravel/soil interface
Friction Coefficient Along Vert. Key Face	0.2		Assumed concrete to silty soil interface
Seismic Coefficient	0.1		
Cohesion Value	0	psi	

Mariaville Civic Association
Mariaville Lake Dam
Engineering Assessment
September 26, 2024

FORCES ACTING ON DAM:

DESCRIPTION OF FORCE	VARIABLE SYMBOL	FORCE (kips)	MOMENT ARM (ft)	COMMENTS
Headwater @ Normal Reservoir Level	Fhw	33.6	3.87	
Headwater @ Ice Loading Level	Fhwi	33.6	3.87	
Headwater @ SDF	Fsdf	68.8	5.53	
Tailwater @ Normal Reservoir Level	Ftw	0.0	0.00	
Tailwater @ SDF	Ftw/sdf	4.0	1.33	
Silt on Upstream Face of Dam	Fsilt	0.0	0.00	
Ice Force	Fice	40.0	11.60	
Weight of Dam Under Crest	W1	153.1	5.50	
Weight of Dam Under Downstream Slope	W2	0.0	0.00	
Weight of Upstream Keyway	W3	19.8	5.50	
Weight of Water on Crest @ SDF	W4	27.5	5.50	
Increase in Water Pressure	Pe	0.01665	-	
Earthquake Force of Water	Fe	1.1216	2.90	
Weight of Dam - Horizontal E'Quake	Sh1	15.3	5.80	
Weight of Dam - Vertical E'Quake	Sv1	15.3	5.50	
Weight of Dam - Horizontal E'Quake	Sh2	0.0	3.87	
Weight of Dam - Vertical E'Quake	Sv2	0.0	0.00	
Uplift @ Normal Reservoir Level	U	31.8	7.33	
Uplift @ Ice Loading Level	Uice	31.8	7.33	
Uplift @ SDF	Usdf	45.6	7.33	
Rock Anchors - Allowable Tension	Rt	0.0	11.00	
Rock Anchors - Shear	Rv	0.0	-	
Dowels - Shear	Dv	0.0	-	
Keyway Pullout - Soil Friction Resistance	Kt	0.1	5.50	
Shear Friction Resistance of Sidewalls	Vf	97.4	5.80	
Shear Strength of Shear Key	Vc	173.8	-	

Mariaville Civic Association
Mariaville Lake Dam
Engineering Assessment
September 26, 2024

STABILITY SUMMARY:

LOADING CONDITION	MODE OF FAILURE							
	OVERTURNING					SLIDING		
	OVERTURNING MOMENT (kip-ft)	RESISTING MOMENTS (kip-ft)	VERTICAL FORCES (kips)	LOCATION OF RESULTANT	FOS	SLIDING FORCES (kips)	RESISTING FORCES (kips)	FOS
Case 1. Normal Reservoir Level	363.43	1516.56	141.14	8.17 0.74	4.17	33.59	230.24	6.86
Case 2. Ice Loading @ Spillway Crest	827.43	1516.56	141.14	4.88 0.44	1.83	73.59	230.24	3.13
Case 3. Spillway Design Flood	714.81	1672.54	154.80	6.19 0.56	2.34	68.78	239.70	3.49
Case 4. Seismic Loading @ Normal Reservoir Level	539.70	1516.21	145.62	6.71 0.61	2.81	50.02	224.12	4.48

Mariaville Civic Association
Mariaville Lake Dam
Engineering Assessment
September 26, 2024

	SUMMARY					
	OVERTURING - LOCATION OF RESULTANT			SLIDING - FACTOR OF SAFETY		
LOADING CONDITION	NYSDEC REQUIREMENT	STABILITY RESULTS	PASS/FAIL	NYSDEC REQUIRED FOS	STABILITY RESULTS FOS	PASS/FAIL
Case 1. Normal Reservoir Level	Middle third of base .33 to .67 base	0.74	PASS	2	6.86	PASS
Case 2. Ice Loading @ Spillway Crest	Middle third of base .33 to .67 base	0.44	PASS	2	3.13	PASS
Case 3. Spillway Design Flood	Middle third of base .33 to .67 base	0.56	PASS	2	3.49	PASS
Case 4. Seismic Loading @ Normal Reservoir Level	Within base greater than 0	0.61	PASS	1.5	4.48	PASS

Mariaville Civic Association
Mariaville Lake Dam
Engineering Assessment
September 26, 2024

EQUATIONS FOR FORCES:

Fhw	=	0.5 x unit weight of water x (dam height @ crest)^2 x LDC
Fhwi	=	0.5 x unit weight of water x (dam height @ crest)^2 x LDC
Fsdf	=	0.5 x unit weight of water x (HWL @ SDF)^2 x LDC
Ftw	=	0.5 x unit weight of water x (normal TWL)^2 x LDC
Ftw/sdf	=	0.5 x unit weight of water x (TWL @ SDF)^2 x LDC
Fice	=	Ice force applied to crest x LDC
W1	=	dam unit weight x dam cross sect. area under crest x LDC
W2	=	dam unit weight x dam cross sect. area downstream x LDC
W3	=	upstream key unit weight x key cross sect. area x LDC
W4	=	water unit weight x water cross sect. area @ sdf x LDC
Rt	=	0.6 x bar yield stress x bar area/bar spacing x LDC
Rv	=	0.4 x bar yield stress x bar area/bar spacing x LDC
Fe	=	0.726 x (increase in water pressure) x (dam height @ crest) x LDC
Sh1	=	seismic coefficient x W1
Sv1	=	seismic coefficient x W1
Sh2	=	seismic coefficient x W2
Sv2	=	seismic coefficient x W2
Dv	=	0.4 x dowel bar yield stress x dowel bar area/dowel bar spacing x LDC
Vc	=	2 x (shear strength of concrete key)^(1/2) x shear key area x 0.85/1000

* LDC = length of dam crest used in analysis

EXHIBIT H
EMERGENCY ACTION PLAN

Mariaville Civic Association

EMERGENCY ACTION PLAN
(EAP)
Dam Safety Program
For
N.Y.S. Dam I.D. # 189-224

Mariaville Lake Dam

Issue Date: 7/2008

Revised Date	1/2011
Revised Date	1/2012
Revised Date	11/2012
Revised	1/2015
Revised	10/23/2017
Revised Date	1/15/2025

Table of Contents

Introduction

This Emergency Action Plan (EAP) defines responsibilities and provides procedures designed to:

- Identify unusual and unlikely conditions which may endanger the Mariaville Lake Dam;
- Initiate remedial actions to prevent or minimize the downstream impacts of a dam failure;
- Initiate emergency actions to warn downstream residents of impending or actual failure of the dam.

Basic EAP Data

Purpose

The purpose of this EAP is to reduce the risk of human life loss and injury and minimize property damage during an unusual or emergency event at Mariaville Lake Dam, NY, N.Y.S. Dam I.D. # 189-224

Potential Impacted Area

See *Evacuation Map* tab (Appendix B–4) and *People at Risk* tab (Appendix B–5) for the locations and contact information of the following residents and businesses that may be flooded if the dam should fail and the estimated time for the flood wave to travel from the dam to these locations:

Dam Information:

Name: **Mariaville Lake Dam** New York State I.D # **189-224**

Location: **Mariaville Lake Dam is located on Mariaville Lake in the Town of Duanesburg, Schenectady County, New York. The dam is located at Latitude N42,49'42", Longitude E74,08"08" on the Duanesburg Quadrangle.**

Type of Dam: **Mariaville Civic Association Dam is a Concrete dam.**

Dam Specifics

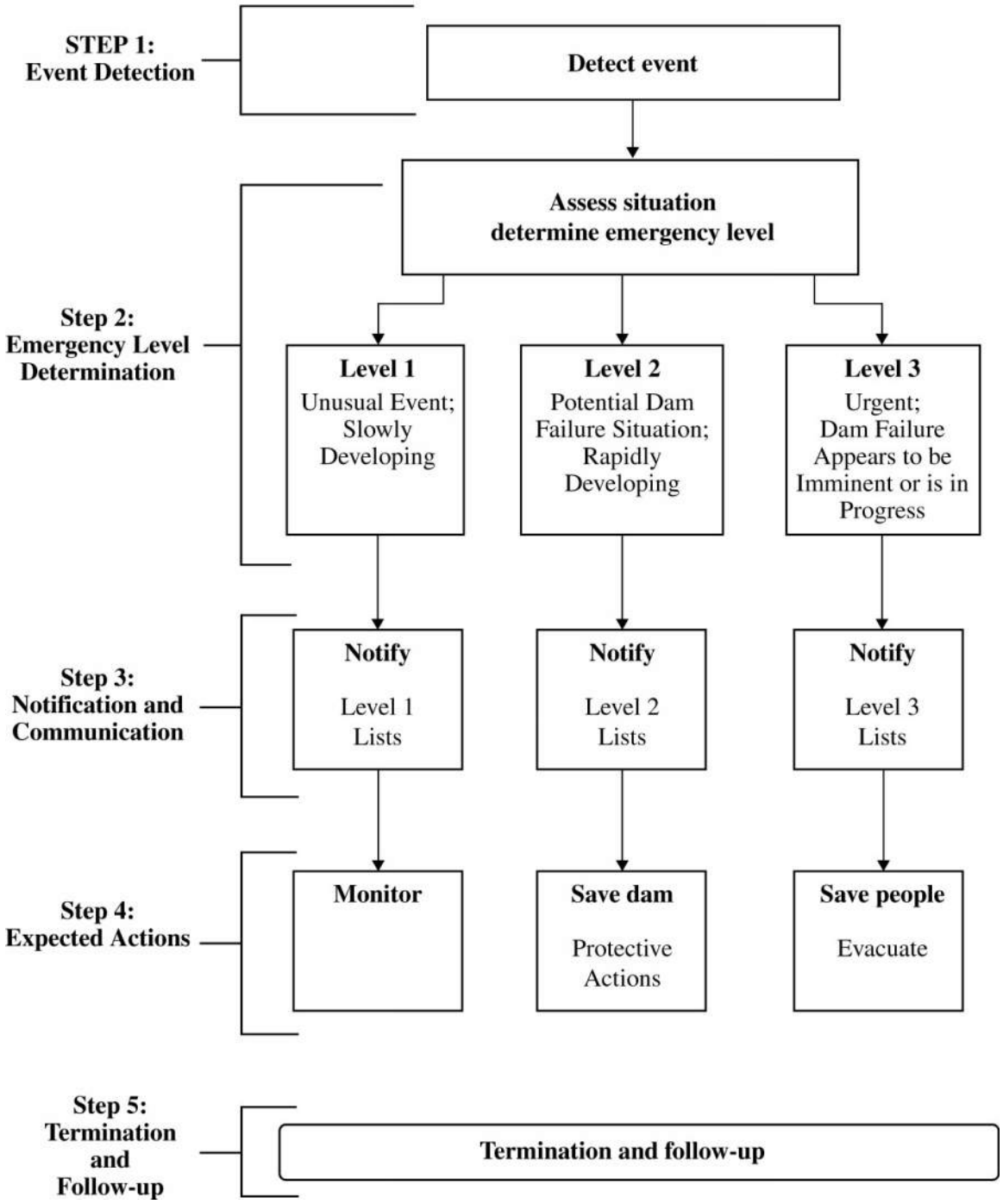
Normal Lake level Spillway Crest ……...**1274 ft, USGS Elevation**
Top of Abutment Walls (USGS)……...**1279 ft, USGS Elevation**
Spillway Elevation (USGS)……...**1274 ft, USGS Elevation**
Spillway Width (Ls) ……..**8 ft**
Spillway Depth from top of Spillway to Top of Abutment walls (Hs) …….**5 ft**
Auxiliary Spillway Elevation (USGS) ……...**1277 ft, USGS Elevation**
Aux spillway Depth form top of Aux. Spillway to top of abutment walls (Has) …. **2.0 ft**
Auxiliary Spillway Width (Las) ……..**20.5 ft**
Maximum Dam Breach Width (under Spillway) (Lb) ……..**8 ft**
Bottom Elevation of Drop inlet invert (Bot. of Breach) (USGS)…….. **1264 ft, USGS Elevation**
Maximum Depth of Breach (Db) ……**10 ft**

Downstream flood path: Chuncaganga Creek to the Mohawk River (see attached Inundation Maps)

Number of homes in Floodplain: According to the Engineering Report completed by John M. McDonald Engineering P.C. February 2008 there are 7 homes in the **immediate** floodplain of Mariaville Dam in the event of a **catastrophic** dam failure. The MCA has conducted a survey of all these homes.

Downstream Property Description: See attached Appendix B-5

EAP Overview



Roles and Responsibilities

Mariaville Civic Association Dam Safety Officer (DSO)

- As soon as an emergency event is observed or reported, immediately determine the emergency level (see *Emergency Levels* tab).
  - Level 1: unusual event, slowly developing
  - Level 2: potential dam failure situation, rapidly developing
  - Level 3: dam failure appears imminent or is in progress
- Immediately notify the personnel in the order shown on the notification chart for the appropriate level (see *Notification Charts* tab).
- Provide updates of the situation to the MCA Fire Department, Police/County Director of Emergency Management dispatcher to assist them in making timely and accurate decisions regarding warnings and evacuations.
- Provide leadership to assure the EAP is reviewed and updated annually and copies of the revised EAP are distributed to all who received copies of the original EAP.

Incident Commander (County Director of Emergency Management)

- Serve as the primary contact person responsible for coordination of all emergency actions.
- When a Level 2 situation occurs: Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 situation occurs.
- When a Level 3 situation occurs:
  - Initiate warnings and order evacuation of people at risk downstream of the dam.
  - Notify local emergency management services to carry out the evacuation of people and close roads within the evacuation area (see *Evacuation Map* tab).
- Decide when to terminate the emergency.
- Participate in an annual review and update of the EAP.

Police & Fire Department

In accordance with the National Incident Management System (NIMS), a Unified Command will be established on the scene but outside of the flood threat area. Unified Command is a management system in which the Command members from the different stake holding agencies (i.e. Police, Fire, Local DPW, etc.) make collective decisions on the response and management activities of the incident (i.e. evacuation, road closure, sheltering, etc.)

- The Operations Section of the Unified Command will ensure that roads and bridges that are being flooded are barricaded to safeguard traffic in the flooded areas.
- The Unified Command will ensure that citizens' notification and escape route public information is conducted to advice the population at risk to prepare for a possible evacuation. *(See the notification list Tab)*
- Participate in annual review and update of the EAP.

Dam Owner's Engineer

- Advise the dam operator of the emergency level determination, if time permits.
- Advise the dam operator of remedial actions to take if Level 2 event occurs, if time permits.

State Dam Safety Agency (New York State Environmental Conservation - Division of Water Bureau of Flood Protection and Dam Safety (518) 402-8151

- Advise the dam operator of the emergency level determination, if time permits.
- Advise the dam operator of remedial actions to take if Level 2 event occurs, if time permits.

STEP 1 - Event Detection

Emergency Level 1—Nonemergency, unusual event, slowly developing:
This situation is not normal but has not yet threatened the operation or structural integrity of the dam but possibly could if it continues to develop. The dam owner's technical representatives and state dam safety officials should be contacted to investigate the situation and recommend actions to take. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation. The County Director of Emergency Management should be informed if it is determined that the conditions may possibly develop into a worse condition that may require emergency actions.

Emergency Level 2—Potential dam failure situation, rapidly developing:
This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure. The County Director of Emergency Management should be notified of this emergency and placed on alert. Also a call to Homeland Security and Emergency Services must also be notified at the NYS Watch Center 518-292-2200. The dam operator should closely monitor the condition of the dam and periodically report the status of the situation to the County Director of Emergency Management. If the dam condition worsens and failure becomes imminent, the County Director of Emergency Management must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

If time permits, the dam owners engineer, and state dam safety officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The dam operator should initiate remedial repairs (note local resources that may be available—see **Appendix B–1**). Time available to employ remedial actions may be hours or days.

Emergency Level 3—Urgent; dam failure appears imminent or is in progress:
This is an extremely urgent situation when a dam failure is occurring or obviously is about to occur and cannot be prevented. Flash flooding will occur downstream of the dam. This situation is also applicable when flow through the spillway is causing downstream flooding of people and roads. The County Director of Emergency Management should be contacted immediately so emergency services can begin evacuations of all at-risk people and close roads as needed as well as the Homeland Security and Emergency Services must also be notified at the NYS Watch Center 518-292-2200. (see *Evacuation Map* tab).

STEP 2 – Emergency Level Determination See the following pages for guidance in determining the proper emergency level for various situations.

GUIDANCE FOR DETERMINING THE EMERGENCY LEVEL

Event	Situation	Emergency Level*
Spillways	Principal spillway severely blocked with debris or structurally damaged	1
	Principal spillway leaking with muddy flows	1
	Auxiliary spillway elevation 1277 ft USGS	3
	Principal spillway blocked with debris and pool is rapidly rising	2
Flooding	National Weather Service issues a flood warning for the area	1
	The lake elevation reaches the predetermined notification trigger elevation 1275ft USGS	2
	The reservoir elevation reaches the predetermined evacuation trigger elevation 1277 ft USGS	3
	Spillway flow is flooding roads and people downstream	3
	Flood flows are overtopping the dam	3
Seepage	New seepage areas in or near the dam	1
	Boils observed downstream of dam	1
	Boils observed downstream of dam with cloudy discharge	2
	New seepage areas with cloudy discharge or increasing flow rate	2
	Seepage with discharge greater than 10 gallons per minute	3
Sinkholes	Observation of new sinkhole in Lake area or on embankment	2
	Rapidly enlarging sinkhole	3
Embankment Cracking	New cracks in the embankment greater than 1/4-inch wide without seepage	1
	Cracks in the embankment with seepage	2
Embankment Movement	Visual movement/slippage of the embankment slope	1
	Sudden or rapidly proceeding slides of the embankment slopes	3
Instruments	*Possible future use*	
Earthquake	Measurable earthquake felt or reported on or within 50 miles of the dam	1
	Earthquake resulting in visible damage to the dam or appurtenances	2
	Earthquake resulting in uncontrolled release of water from the dam	3
Security Threat	Verified bomb threat that, if carried out, could result in damage to the dam	2
	Detonated bomb that has resulted in damage to the dam or appurtenances	3
Sabotage / Vandalism	Damage to dam or appurtenances with no impacts to the functioning of the dam	1
	Modification to the dam or appurtenances that could adversely impact the functioning of the dam	1
	Damage to dam or appurtenances that has resulted in seepage flow	2
	Damage to dam or appurtenances that has resulted in uncontrolled water release	3
Embankment Movement	Visual movement/slippage of the embankment slope	1
	Sudden or rapidly proceeding slides of the embankment slopes	3

* Emergency level 1: Non-emergency, unusual event, slowly developing

Emergency level 2: Potential dam failure situation, rapidly developing

Emergency level 3: Urgent; dam failure appears to be imminent or is in progress.

POSSIBLE EMERGENCY CONDITIONS

Listed below are some, not necessarily all, of the events which can lead directly to the failure of the dam. **SPECIAL NOTE**: It is important to note in June of 2007 the Mariaville Civic Association (MCA) commissioned John M. McDonald Engineering, P.C. to evaluate the Hazard Classification of the Mariaville Lake Dam. This report was submitted to DEC in March of 2008. Although the DEC has decided to maintain the classification level as a C hazard it has been recognized the dam is in good condition presently and does not constitute a threat. The information utilized to evaluate the hazard classification was as follows:

- Existing documentation available on the dam via DEC Records and MCA Records
- Areal and Topographic mapping of the area
- Site visits and minor surveying of the areas limited to the extent needed to confirm downstream residences, structures, topography, utilities, bridges, drainage structures, and other miscellaneous features.
- Hydraulic Modeling utilizing HEC-RAS and HYDROCAD

Included after each one is a brief outline of steps to take in trying to stabilize the situation:

EARTHQUAKE:

If an earthquake of Magnitude 5.0 or greater has been reported in the vicinity, or the responsible individual(s) has felt ground motion and experienced damage a large earthquake characterized by the following:

"Felt by all. People walk unsteadily. Windows, dishes, glassware become broken due to the ground shaking. Knickknacks, books etc. knocked off shelves. Furniture moved or overturned. Weak plaster and masonry cracked. Trees bushes shaken visibly or heard to rustle."

1. Immediately conduct a general overall visual inspection of the dam.
2. **IF** the dam is failing or is damaged to the extent that there is increased flow passing downstream, immediately **Activate a level 3 response**.
3. Check the dam crest for settlement. If the dam crest has dropped more than ½ feet, lower the lake level the same amount as the settlement. If the outlet works are damaged, it may be necessary to install siphon pipes or pumps to lower the lake level. **Contact the Mariaville Fire Department for equipment.** The level of the lake should be lowered until it can be examined by the appropriately qualified engineer. **Activate a level 2 response**
4. If damage has occurred but is not judged serious enough to cause failure of the dam. Quickly observe the nature, location, and the extent of the damage and evaluate the potential for failure. Contact the Mariaville Fire Department for notification purposes. Contact the County Emergency Management Office and make notification to ENCON Dam Safety for notification purposes (518) 402-8151. **Activate a level 1 response**
5. If there appears to be no imminent danger of the dam failure or a level 2 or 3 the dam should be thoroughly inspected for the following:

    - Both faces of the dam for cracks, settlement, or seepage.
    - Abutments for possible displacement.
    - Spillway structure to confirm continued safe operation.
    - Outlet works, control house, tunnel and gate chamber for structural integrity.

- Drains and seeps for turbidity, muddy water or increased flow.
- Spillway structure for continued safe operation.
- Lake and downstream areas for landslides;

Report all findings to ENCON and all other agencies that have been contacted earlier during the emergency. Also make sure to keep a close watch on the dam for the next two to four weeks with daily visual inspections for the first 7 days after the occurrence. Note any changes and if needed repeat steps 1-5 above.

FLOODING:

Emergency Level 1 – Flood Warning issued by National Weather Service

1. Flooding is expected to occur in low lying areas that triggers surveillance of the dam, or predicted rainfall is to exceed 5 inches in 24 hours, 4 inches in 12 hours, or 3 inches in 6 hours.

Emergency Level 2 - Potential Dam Failure Situation; Rapidly Developing

1. The Lake elevation has reached the predetermined trigger elevation of **1276 ft** that requires Emergency Level 2 notification.
2. Flow through the spillways is expected to cause flooding that could threaten people, homes, and/or roads downstream from the dam.

Emergency Level 3 – Urgent; Severe Flooding is occurring to roads, houses and loss of life is probable

The Lake elevation has reached the predetermined trigger elevation of **1277 ft** that requires Emergency Level 2 notification

1. Significant flooding is occurring to downstream roads, houses, buildings, and people are at risk of flood dangers from spillway flows.

If indications show the spillway will not handle the expected runoff without problems and or the lake is 3 3 3 feet over the dam crest contact Emergency Services immediately to report the following:

- Current lake elevations
- Rate the lake is rising
- Weather conditions – past, present, and predictions
- Discharge conditions of the creeks and flow from the dam

Any time the water in the lake exceeds the maximum normal level of operation or an elevation of 1278 feet, Emergency Level 3 notification will commence

DAILY VISIUAL INSPECTIONS OF THE DAM IS REQUIRED

CRACKING OF THE DAM:

Determine the location, size of the affected area(s) (height, width, and depth) severity, estimated seepage discharge, clear or cloudy seepage, and the reservoir and tail water elevations. If failure appears likely, IMMEDIATELY IMPLEMENT **THE NOTIFICATION FLOWCHART** procedures; otherwise, contact ENCON or a recommendation.

SUDDEN WATER RELEASES:

In case of sudden, planned or unplanned, large water releases from the outlet works or spillway (i.e. opening gates or valves, pulling stop board), notify downstream residents and the appropriate agencies of the increased flow.

OTHER PROBLEMS:

In case of other problems occurring that might pose a threat to the dam safety, contact the Dam Safety Officer Robert Cuttita at 518-864-5570 or 852-9117 and explain the situation as best as possible.

Step – 3 Notification

NOTIFICATION AND COMMUNICATION

Notification

After the emergency level has been determined, the people on the following notification charts for the appropriate emergency level shall be notified immediately.

Communication

Emergency Level 1—Nonemergency, unusual event; slowly developing:
The DSO should contact their Engineer **(KB Engineering)** and the Division of Water Bureau of Flood Protection and Dam Safety (518) 402-8151. Describe the situation and request technical assistance with the next steps to take.

Emergency Level 2—Emergency event, potential dam failure situation; rapidly developing:
The following message may be used to help describe the emergency to the County Director of Emergency Management or emergency management personnel. Also, a call to the Homeland Security and Emergency Services must also be notified at the NYS Watch Center 518-292-2200.:

"This is _____Identify yourself; name, position)_____.

We have an emergency condition at Mariaville Lake Dam, Schenectady County, NY on Mariaville Lake in the Town of Duanesburg, Schenectady County, New York. The dam is located at Latitude N42,49'42", Longitude E74,08"08" on the Duanesburg Quadrangle

We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 2.

We are implementing predetermined actions to respond to a rapidly developing situation that could result in dam failure.

Please prepare to evacuate the area along low-lying portions of Mariaville below the dam.

We will advise you when the situation is resolved or if the situation gets worse.

I can be contacted at the following number _____. If you cannot reach me, please call the following alternative number _____."

Emergency Level 3—Urgent event; dam failure appears imminent or is in progress:
The Mariaville Fire Department and the County Director of Emergency Management should be contacted immediately and the area evacuated (see *Evacuation Map* tab). The following actions should be taken:

1. Call the Mariaville Fire Department, the County Director of Emergency Management's dispatch center and the Homeland Security and Emergency Services must also be notified at the NYS Watch Center 518-292-2200. Be sure to say, **"This is an emergency."** They will call other authorities and the media and begin the evacuation. The following message may be used to help describe the emergency situation to the County Director of Emergency Management or emergency management personnel:

   "This is an emergency. This is _____Identify yourself; name, position)_____.

   Mariaville Lake Dam, Schenectady County, NY on Mariaville Lake in the Town of Duanesburg, Schenectady County, New York. The dam is located at Latitude N42,49'42", Longitude E74,08"08" on the Duanesburg Quadrangle is failing. The downstream area must be evacuated immediately. Repeat, Mariaville Lake Dam is failing; evacuate the area along low-lying portions of Route 159 below the dam.

   We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 3. Reference the evacuation map in your copy of the Emergency Action Plan.

   I can be contacted at the following number _____. If you cannot reach me, please call the following alternative number_____."

2. Do whatever is necessary to bring people in immediate danger (anyone on the dam, downstream from the dam, boating on the lake, or evacuees) to safety if directed by the County Director of Emergency Management.
3. Keep in frequent contact with the County Director of Emergency Management and emergency services to keep them up to date on the condition of the dam. They will tell you how you can help handle the emergency.
4. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or telephone that works, or (3) get someone else to try to re-establish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to re-establish contact with the Mariaville Fire Department and the County Director of Emergency Management and emergency services.

Emergency Level 1 Notifications

Nonemergency
Unusual Event: Slowly Developing, or Rainfall Is to Exceed 5 Inches in 24 Hours, 4 Inches in 12 Hours, Or 3 Inches in 6 Hours

Dam Safety Officers

Robert Cuttita	Assistant – Chris Schafer
	518-864-5089(Home)
518-852-9117 (Cell)	518-376-9828 (Cell)

(1)

Dam Operator's Engineer

KB Engineering and Architecture, PC

Douglas Cole

518-348-7880 (Office)

DCole@prineeng.com

(2)

NYS ENCON DAM SAFETY

NY Dam Safety

518-402-8151 (Office)

Note:
1, 2, etc., denotes call sequence

See *Emer. Services Contacts* tab for contact Information for back-ups to the persons shown above

Emergency Level 2 Notifications

Emergency Event, Potential Dam Failure
Situation Rapidly Developing; or Predetermined Trigger Elevation Of 1274ft Has Been Reached.

Dam Inspectors

Robert Cuttita — 518-852-9117 (Cell)

Assistant – Chris Schafer — 518-864-5089(Home) 518-376-9828 (Cell)

(1)

Dam Operator's Engineer

KB Engineering and Architecture, PC

Douglas Cole

518-348-7880 (Office)

DCole@prineeng.com

(2)

Mariaville Fire Department

Chief

or

24-Hour 911

(3)

NYS ENCON DAM SAFETY

NY Dam Safety

518-402-8151 (Office)

Schenectady Emergency Management Dispatcher

Schenectady County Police Dispatcher 388-4300

Homeland Security and Emergency Services NYS Watch Center 518-292-2200.

New York State Canal Corporation518-270-8400

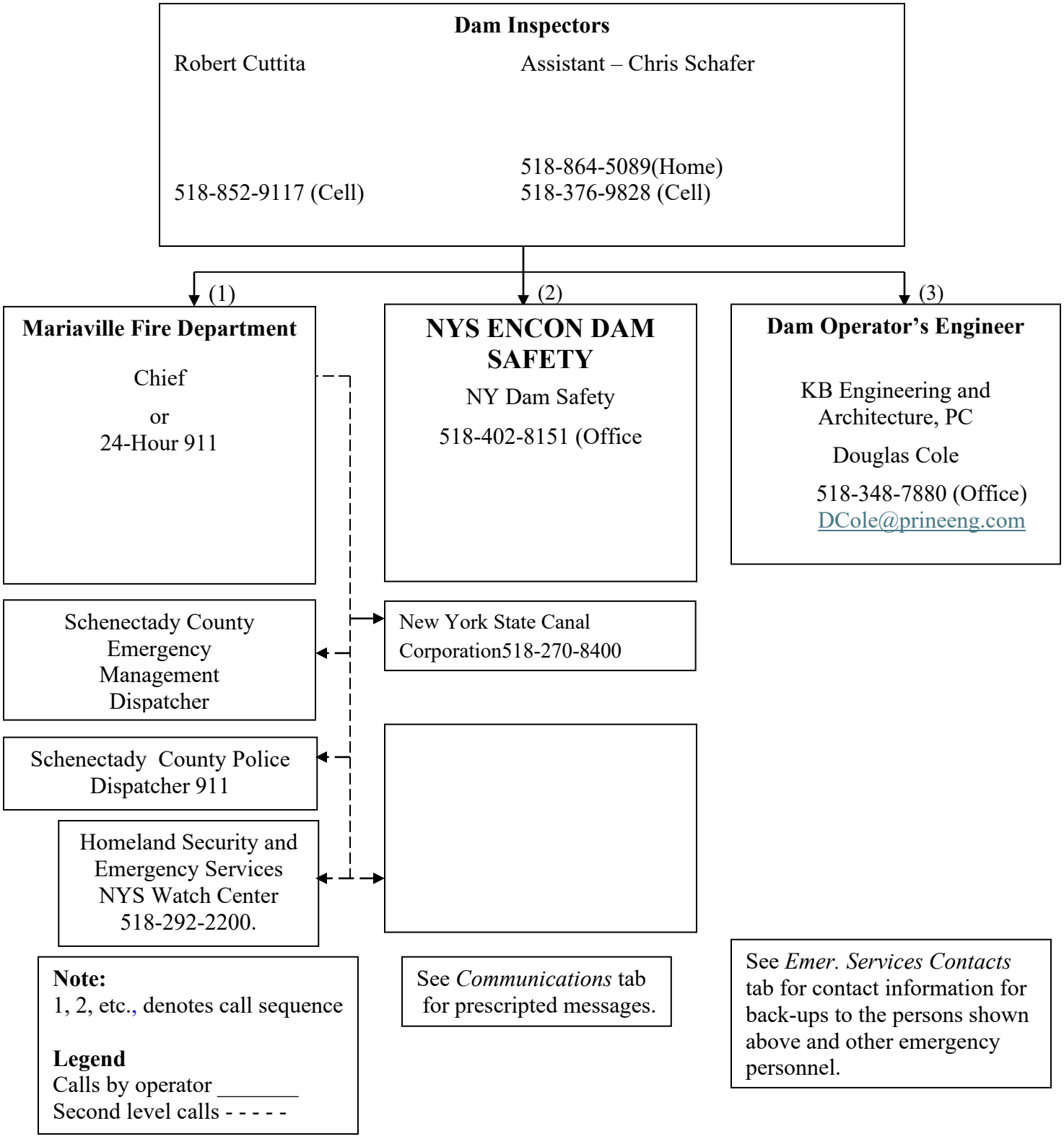
Note:
1, 2, etc., denotes call sequence

See *Communications* tab for prescripted messages.

See *Emer. Services Contacts* tab for contact information for back-ups to the persons shown above and other emergency personnel.

Emergency Level 3 Notifications

Urgent Event, Dam Failure Appears Imminent or is in Progress, or Predetermined Trigger Elevation of 1277ft Has Been Reached.



Emergency Services & Other Contacts

Agency / Organization	Principal Contact & Email Address	Address	Office telephone number	Alternate telephone numbers
Homeland Security and Emergency Services	NYS Watch Center	1220 Washington ave Bld 22, Albany, NY 12226	518-292-2200	
New York State Dam Safety Department		625 Broadway Albany, NY 12233	518-402-8151	
Mariaville Fire Department		Mariaville Road	911	518-864-5793
Town of Duanesburg	Bill Wenzel Town Supervisor	Town Hall Duanesburg	518-895-2331	
Town of Duanesburg Code enforcement		Town Hall Duanesburg	518- 895-2040 ext108	
National Weather Service	Climatologist	44087 Weather Service Rd Sterling, VA	1-800-523-4129	1-703-260-0107
Sheriffs' office	Sheriff Dom Dagostino	Schenectady County	518-388-4300	
State Police		Prince town	518-630-1700	
SEMO		NYS	518-457-8900	518-457-2200
NY Dam Safety			518-402-8151	
KB Engineering and Architecture, PC	Douglas Cole		518-348-7880 (Office)	
New York State Canal Corporation	www.canals.ny.gov	200 Davis Ave, Waterford, NY 12188	518-270-8400	

STEP 4 – EXPECTED ACTIONS

If the Police or emergency management staff receive a 911 call regarding observations of an unusual or emergency event at the dam, they should immediately contact the dam owner, operator and/or the dam inspectors. After the dam owner and operator determine the emergency level, the following actions should be taken. If time permits the technical representative and the New York Dam Safety Division should be contacted for technical consultation.

Emergency Level 1: Non-emergency, Unusual Event; Slowly Developing:

A. The dam owner or operator, and technical representative should inspect the dam. At a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also check the Lake area, abutments, and downstream channel for signs of changing conditions. IF INCREASED SEEPAGE, EROSION, CRACKING, OR SETTLEMENT ARE OBSERVED, IMMEDIATELY REPORT THE OBSERVED CONDITIONS TO THE NRCS AND THE STATE DAM SAFETY OFFICE; REFER TO THE EMERGENCY LEVEL TABLE FOR GUIDANCE IN DETERMINING THE APPROPRIATE EVENT LEVEL FOR THE NEW CONDITION AND RECOMMENDED ACTIONS.
B. Record all of the contacts that were made on the *Contact Checklist* (Appendix A-1). Record all information, observations, and actions taken on the *Event Log Form* (Appendix A-2). Note the time of changing conditions. Document the situation with photographs and video if possible.
C. The dam owner or operator should contact the State Dam Safety Office and request technical staff to investigate the situation and recommend corrective actions.

Emergency Level 2: Potential Dam Failure Situation; Rapidly Developing:

A. The dam owner or operator should contact the State Dam Safety Office to report the situation and, if time permits, request technical staff to investigate the situation and recommend corrective actions.
B. The dam owner or operator should contact the County Director of Emergency Management, and the State Dam Safety Office to inform them that the emergency action plan has been activated and if current conditions get worse, an emergency situation may require evacuation. Preparations should be made for possible road closures and evacuations.
C. Provide updates to the County Director of Emergency Management and emergency services personnel to assist them in making timely decisions concerning the need for warnings, road closures, and evacuations.
D. If time permits, the dam owner, operator, and/or his technical representative should inspect the dam. At a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also check the reservoir area, abutments, and downstream channel for signs of changing conditions. IF PIPING, INCREASED SEEPAGE, EROSION, CRACKING, OR SETTLEMENT ARE OBSERVED, IMMEDIATELY REPORT THE OBSERVED CONDITIONS TO THE STATE DAM SAFETY OFFICE; REFER TO THE EMERGENCY LEVEL TABLE FOR GUIDANCE IN DETERMINING THE APPROPRIATE EVENT LEVEL FOR THE NEW CONDITION AND RECOMMENDED ACTIONS.
E. Record all of the contacts that were made on the *Contact Checklist* (Appendix A-1). Record all information, observations, and actions taken on the *Event Log Form* (Appendix A-2). Note the time of changing conditions. Document the situation with photographs and video if possible.
F. If time permits, the following emergency remedial actions should be taken as appropriate.

Emergency Remedial Actions

If time permits, the following emergency remedial actions should be considered for Emergency Level 2 conditions. Immediate implementation of these remedial actions may delay, moderate, or prevent the failure of the dam. Several of the listed adverse or unusual conditions may be apparent at the dam at the same time, requiring implementation of several modes of remedial actions. Close monitoring of the dam must be maintained to confirm the success of any remedial action taken at the dam. Time permitting, any remedial action should be developed through consultation with the State Dam Safety Office. See *Resources Available* (Appendix B-1) for sources of equipment and materials to assist with remedial actions.

Embankment Overtopping

1. If the reservoir is no longer rising, place sandbags along the low areas of the top of the dam to control wave action, reduce the likelihood of flow concentration during minor overtopping, and to safely direct more water through the spillway.
    - Cover the weak areas of the top of the dam and downstream slope with riprap, sandbags, plastic sheets, or other materials to provide erosion-resistant protection.

Seepage and Sinkholes

1. Open principal spillway gate to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a non-erosive velocity. If the gate is damaged or blocked, pumping or siphoning may be required. Continue lowering the water level until the seepage stops.
2. If the entrance to the seepage origination point is observed in the reservoir (possible whirlpool) and is accessible, attempt to reduce the flow by plugging the entrance with readily available materials, including hay bales, bentonite, soil or rock fill, or plastic sheeting.
3. Cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place. Alternatively, construct sandbag or other types of ring dikes around seepage exit areas to retain a pool of water, providing back pressure and reducing the erosive nature of the seepage.
    - Prevent vehicles and equipment from driving between the seepage exit points and the embankment to avoid potential loss from the collapse of an underground void.

Embankment Movement

- Open outlet(s) and lower the reservoir to a safe level at a rate commensurate with the urgency and severity of the condition of the slide or slump. If the gate is damaged or blocked, pumping or siphoning may be required.

2. Repair settlement of the crest by placing sandbags or earth and rock fill materials in the damaged area to restore freeboard.

    - Stabilize slides by placing a soil or rock fill buttress against the toe of the slide.

Earthquake

1. Immediately conduct a general overall visual inspection of the dam.
2. Perform field survey to determine if there has been any settlement and movement of the dam embankment, spillway and low-level outlet works.
3. Drain reservoir if required.

Emergency Level 3: Urgent; Dam Failure Appears to be Imminent or is in Progress:

A. The dam owner or operator shall immediately contact the County Director of Emergency Management and others shown on the notification flow chart.
B. The County Director of Emergency Management shall lead the efforts to carry out warnings, close roads, and evacuations of people at risk downstream from the dam (see *Evacuation Map* tab).
C. Emergency Management services personnel shall alert the general public and immediately evacuate at-risk people and close roads as necessary.
D. The dam owner or operator shall maintain continuous communication and provide the County Director of Emergency Management with updates of the situation to assist him in making timely decisions concerning warnings and evacuations.
E. The dam owner or operator should record all of the contacts that were made on the *Contact Checklist* (Appendix A-1). Record all information, observations, and actions taken on the *Events Log Form* (Appendix A-2). Note the time of changing conditions. Document the situation with photographs and video if possible.
F. Advise people monitoring the dam to follow safe procedures. Everyone should stay away from any of the failing structures or slopes and out of the potential breach inundation areas.

Step 5 – TERMINATION

Whenever the EAP has been activated, an emergency level has been declared, all EAP actions have been completed, and the emergency is over, the EAP operations must eventually be terminated and follow-up procedures completed.

Termination Responsibilities

The County Director of Emergency Management is responsible for terminating EAP operations and relaying this decision to the ENCON District Manager. It is then the responsibility of each person to notify the same group of contacts that were notified during the original event notification process to inform those people that the event has been terminated.

Prior to termination of an Emergency Level 3 event that has not caused actual dam failure, the State Dam Safety Officer will inspect the dam or require the inspection of the dam to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined those conditions do not pose a threat to people or property, the County Director of Emergency Management will be advised to terminate EAP operations as described above.

The dam owner shall assure that the *Dam Safety Emergency Situation Report* (Appendix A-3) is completed to document the emergency event and all the actions taken. The dam owner shall distribute copies of the completed report to the State Dam Safety Office and his technical representative.

Maintenance - EAP Review and Revision

EAP annual review

The Dam Owner or their representative will review and, if needed, update the EAP at least once each year. It is required to contact NY Encon's Dam Safety every other year to verify that the Plan has been reviewed and updated as necessary. The EAP annual review will include the following:

- Calling all contacts on the three notification charts in the EAP to verify that the phone numbers and persons in the specified positions are current. The EAP will be revised if any of the contacts have changed.
- Contacting the local law enforcement agency to verify the phone numbers and persons in the specified positions. In addition, the Dam Owner or his representative will ask if the person contacted knows where the EAP is kept and if responsibilities described in the EAP are understood.
- Calling the locally available resources to verify that the phone numbers, addresses, and services are current.

Revisions

The Dam Owner or their representative is responsible for updating the EAP document. The EAP document held by the NYS ENCON is the master document. When revisions occur, the Mariaville Civic Association will provide the revised pages and a revised revision summary page to all the EAP document holders. The document holders are responsible for revising outdated copy of the respective document(s) whenever revisions are received. Outdated pages shall be immediately discarded to avoid any confusion with the revisions.

EAP Periodic Test

The dam owner will host and facilitate a periodic test of the EAP at least once every 5 years.

The periodic test will consist of a meeting, including a tabletop exercise, conducted at the Mariaville Volunteer Fire Department. Attendance should include the dam owner, dam inspectors, the owners engineer, NY Dam Safety, the emergency management director, and at least one representative of the local law enforcement agency, and others with key responsibilities listed in the EAP. At the discretion of the dam owner, other organizations that may be involved with an unusual or emergency event at the dam are encouraged to participate. Before the tabletop exercise begins, meeting participants will visit the dam during the periodic test to familiarize themselves with the dam site.

The tabletop exercise will begin with the facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario will be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they would take to address and resolve the scenario. The narrator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise. The dam owner or his representative should complete an event log as they would during an actual event.

After the tabletop exercise, the five sections of the EAP will be reviewed and discussed. Mutual aid agreements and other emergency procedures can be discussed. The dam owner or his representative will prepare a written summary of the periodic test and revise the EAP, as necessary.

Record of Holders of Control Copies of this EAP

Copy Number	Organization	Person receiving copy
1	Schenectady County DPW	Paul Sheldon Director of Public Works
2	Duanesburg Highway Superintendent	Keith Hudson
3	Duanesburg Supervisor	Bill Wenzel
4	Schenectady County Sheriff	Dom Dagostino
5	Schenectady County Director of Emergency Management	**Mark LaViolette** *Director* Phone: (518) 370-3113 x1
6	Chief Mariaville Fire Department	Scott Burskowski
7	Mariaville Civic Association Dam Safety Officer	Robert Cuttita
8	Mariaville Civic Association President	Eric Unser
9	New York Power Authority^ Barry Anctil EAP Coordinator 30 South Pearl Street, 10th Floor Albany, NY 12207	Barry.Anctil@nypa.gov EAP@canals.ny.gov
10	NYS Canal Corporation^ Joseph Moloughney Eastern Regional Canal Engineer 30 South Pearl Street, 5th Floor Albany, NY 12207 Joseph.Moloughney@canals.ny.gov	200 Davis Avenue Waterford, NY 12188
11	Duanesburg Ambulance	Chief Peter Brodie

Record of Revisions and Updates Made to EAP

Revision Number	Date	Revisions made	By whom
1	1/9/2012	Updated contact information to include the newly elected officials. Submitted the updated plan to county emergency management for review and approval	Robert Cuttita
2	10/23/2017	Updated contact information to include newly elected officials. Will review at the Dam Meeting scheduled for 10/24/2017	Robert Cuttita
3	3/28/2018	Updated Homeland Security and Emergency Services contact information and fwd them a copy per a letter received on March 14, 2018	R cuttita
4	1/13/2025	Updated contact information Added the Canal Corporation, Made contact information more generalized due to the consistent changing of personnel. Added NY Power Authority. Added letter from the Canal Corp at the end of this EAP	Robert Cuttita

Concurrences

By my signature, I acknowledge that I, or my representative, have reviewed this plan and concur with the tasks and responsibilities assigned herein for my organization and me.

1._____

Signature *Organization* *Date*

Printed name and title: _____, Director, Schenectady County DPW

2._____

Signature *Organization* *Date*

Printed name and title: _____, Duanesburg Highway Superintendent, Duanesburg, NY

3._____

Signature *Organization* *Date*

Printed name and title: _____, Emergency Management Coordinator, Schenectady County

4._____

Signature *Organization* *Date*

Printed name and title: _____, Sheriff, Schenectady County

5._____

Signature *Organization* *Date*

Printed name and title: _____, Dam Safety Officer, Mariaville Civic Association, NY

6. _____

Signature *Organization* *Date*

Printed name and title: _____, Chief Mariaville Fire Department

7._____

Signature *Organization* *Date*

Printed name and title: _____, Town Supervisor Duanesburg

8._____

Signature *Organization* *Date*

Printed name and title: _____, Mariaville Civic Association President

9._____

Signature *Organization* *Date*

Printed name and title: _____, Duanesburg Ambulance Corps.

10._____

Signature *Organization* *Date*

Printed name and title: _____, _____

Appendices—Forms, Glossary, Maps, and Supporting Data

Appendix A

A–1 Contact Checklist

A–2 Unusual or Emergency Event Log Form

A–3 Dam Emergency Situation Report Form

A–4 Glossary of Terms

Appendix B

B–1 Resources Available

B–2 Location and Vicinity Maps

B–3 Watershed Project Map

B–4 Evacuation Map

B–5 Residents/Businesses/Highways at Risk

B–6 Plan View of Dam

B–7 Profile of Principal Spillway

B–8 Reservoir Elevation-Area-Volume and Spillway Capacity Data

B–9 National Inventory of Dams (NID) Data

Appendix A–1

Contact Checklist

Mariaville Lake

Mariaville, NY Date _____

The following contacts should be made immediately after the emergency level is determined (see pages 7–10 for guidance to determine the appropriate emergency level for a specific situation). The person making the contacts should initial and record the time of the call and who was notified for each contact made. See the *Notification Charts* tab for critical contact information and *Emer. Services Contacts* tab for contact information for other possible emergency services.

Emergency Level 1 (see page 12)	Person Contacted	Time Contacted	Contacted by
___ Dam Owner	_____	_____	_____
___ Dam Owner's Engineer	_____	_____	_____
___ NY ENCON Dam Safety	_____	_____	_____

Emergency Level 2 (see page 13)	Person Contacted	Time Contacted	Contacted by
____ Dam Owner	_____	_____	_____
____ Dam Owner's Engineer	_____	_____	_____
____ Emergency Management Director	_____	_____	_____
____ NY ENCON Dam Safety	_____	_____	_____
___ NYS Homeland security	_____	_____	_____

Emergency Level 3 (see page 14)	Person Contacted	Time Contacted	Contacted by
____ Emergency Management Director	_____	_____	_____
____ Dam Owner	_____	_____	_____
____ Dam Owner's Engineer	_____	_____	_____
____ NY ENCON Dam Safety	_____	_____	_____
___ NYS Homeland security	_____	_____	_____
____ 911	_____	_____	_____

Appendix A–2

Unusual or Emergency Event Log

(to be completed during the emergency)

Dam name: Mariaville Lake Dam NYS ID# 189-224 County: Schenectady County

When and how was the event detected?

_____

_____

Weather conditions: _____

_____

General description of the emergency situation:

_____

_____

_____

Emergency level determination: _____ Made by: _____

Actions and Event Progression

Date	Time	Action/event progression	Taken by

Report prepared by: _____ Date: _____

Appendix A–3

Dam Emergency Situation Report

(to be completed following the termination of the emergency)

Dam name: Mariaville Lake Dam NYS ID# 189-224

Dam location: **Mariaville Lake Dam is located on Mariaville Lake in the Town of Duanesburg, Schenectady County, New York. The dam is located at Latitude N42,49'42", Longitude E74,08"08" on the Duanesburg Quadrangle.**

Date: Time:

Weather conditions: _____

General description of emergency situation:

_____

_____

Area(s) of dam affected:

_____

_____

Extent of dam damage: _____

Possible cause(s): _____

Effect on dam's operation:_____

Initial reservoir elevation: _____ Time: _____

Maximum reservoir elevation: _____ Time: _____

Final reservoir elevation: _____ Time: _____

Description of area flooded downstream/damages/injuries/loss of life: _____

_____

_____

Other data and comments:

_____

Observer's name and telephone number:_____

Report prepared by: _____ Date: _____

Appendix A–4
Glossary of Terms

Abutment That part of the valleyside against which the dam is constructed. The left and right abutments of dams are defined with the observer looking downstream from the dam.

Acre-foot A unit of volumetric measure that would cover 1 acre to a depth of 1 foot. One acre-foot is equal to 43,560 cubic feet or 325,850 gallons.

Berm A nearly horizontal step (bench) in the upstream or downstream sloping face of the dam.

Boil A disruption of the soil surface due to water discharging from below the surface. Eroded soil may be deposited in the form of a ring (miniature volcano) around the disruption.

Breach An opening through the dam that allows draining of the reservoir. A controlled breach is an intentionally constructed opening. An uncontrolled breach is an unintended failure of the dam.

Conduit A closed channel (round pipe or rectangular box) that conveys water through, around, or under the dam.

Control section A usually level segment in the profile of an open channel spillway above which water in the reservoir discharges through the spillway.

Cross section A slice through the dam showing elevation vertically and direction of natural water flow horizontally from left to right. Also, a slice through a spillway showing elevation vertically and left and right sides of the spillway looking downstream.

Dam An artificial barrier generally constructed across a watercourse for the purpose of impounding or diverting water.

Dam failure The uncontrolled release of a dam's impounded water.

Dam Operator The person(s) or unit(s) of government with responsibility for the operation and maintenance of dam.

Drain, toe or foundation, or blanket A water collection system of sand and gravel and typically pipes along the downstream portion of the dam to collect seepage and convey it to a safe outlet.

Drainage area (watershed) The geographic area on which rainfall flows into the dam.

Drawdown The lowering or releasing of the water level in a reservoir over time or the volume lowered or released over a particular period of time.

Emergency A condition that develops unexpectedly, endangers the structural integrity of the dam and/or downstream human life and property, and requires immediate action.

Emergency Action Plan (EAP)	A formal document identifying potential emergency conditions that may occur at the dam and specifying preplanned actions to minimize potential failure of the dam or minimize failure consequences including loss of life, property damage, and environmental impacts.
Evacuation map	A map showing the geographic area downstream of a dam that should be evacuated if it is threatened to be flooded by a breach of the dam or other large discharge.
Filter	The layers of sand and gravel in a drain that allow seepage through an embankment to discharge into the drain without eroding the embankment soil.
Freeboard	Vertical distance between a stated water level in the reservoir and the top of dam.
Gate, slide or sluice, or regulating	An operable, watertight valve to manage the discharge of water from the dam.
Groin	The area along the intersection of the face of a dam and the abutment.
Hazard classification	A system that categorizes dams (high, significant, or low) according to the degree of their potential to create adverse incremental consequences such as loss of life, property damage, or environmental impacts of a failure or misoperation of a dam.
Height of dam	The vertical distance between the lowest point along the top of the dam and the lowest point at the downstream toe, which usually occurs in the bed of the outlet channel.
Hydrograph, inflow or outflow, or breach	A graphical representation of either the flow rate or flow depth at a specific point above or below the dam over time for a specific flood occurrence.
Incident Commander	The highest predetermined official available at the scene of an emergency situation.
Instrumentation	An arrangement of devices installed into or near dams that provide measurements to evaluate the structural behavior and other performance parameters of the dam and appurtenant structures.
Inundation area or map	The geographic area downstream of the dam that would be flooded by a breach of the dam or other large discharge.
Notification	To immediately inform appropriate individuals, organizations, or agencies about a potentially emergency situation so they can initiate appropriate actions.
Outlet works (principal spillway)	An appurtenant structure that provides for controlled passage of normal water flows through the dam.
Piping	The progressive destruction of an embankment or embankment foundation by internal erosion of the soil by seepage flows.

Probable Maximum Precipitation (PMP) or Flood (PMF)	The theoretically greatest precipitation or resulting flood that is meteorologically feasible for a given duration over a specific drainage area at a particular geographical location.
Reservoir	The body of water impounded or potentially impounded by the dam.
Riprap	A layer of large rock, precast blocks, bags of cement, or other suitable material, generally placed on an embankment or along a watercourse as protection against wave action, erosion, or scour.
Risk	A measure of the likelihood and severity of an adverse consequence.
Seepage	The natural movement of water through the embankment, foundation, or abutments of the dam.
Slide	The movement of a mass of earth down a slope on the embankment or abutment of the dam.
Spillway (auxiliary or emergency)	The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam.
Spillway capacity	The maximum discharge the spillway can safely convey with the reservoir at the maximum design elevation.
Spillway crest	The lowest level at which reservoir water can flow into the spillway.
Tailwater	The body of water immediately downstream of the embankment at a specific point in time.
Toe of dam	The junction of the upstream or downstream face of an embankment with the ground surface.
Top of dam (crest of dam)	The elevation of the uppermost surface of an embankment that can safely impound water behind the dam.

Appendix B–1
Resources Available

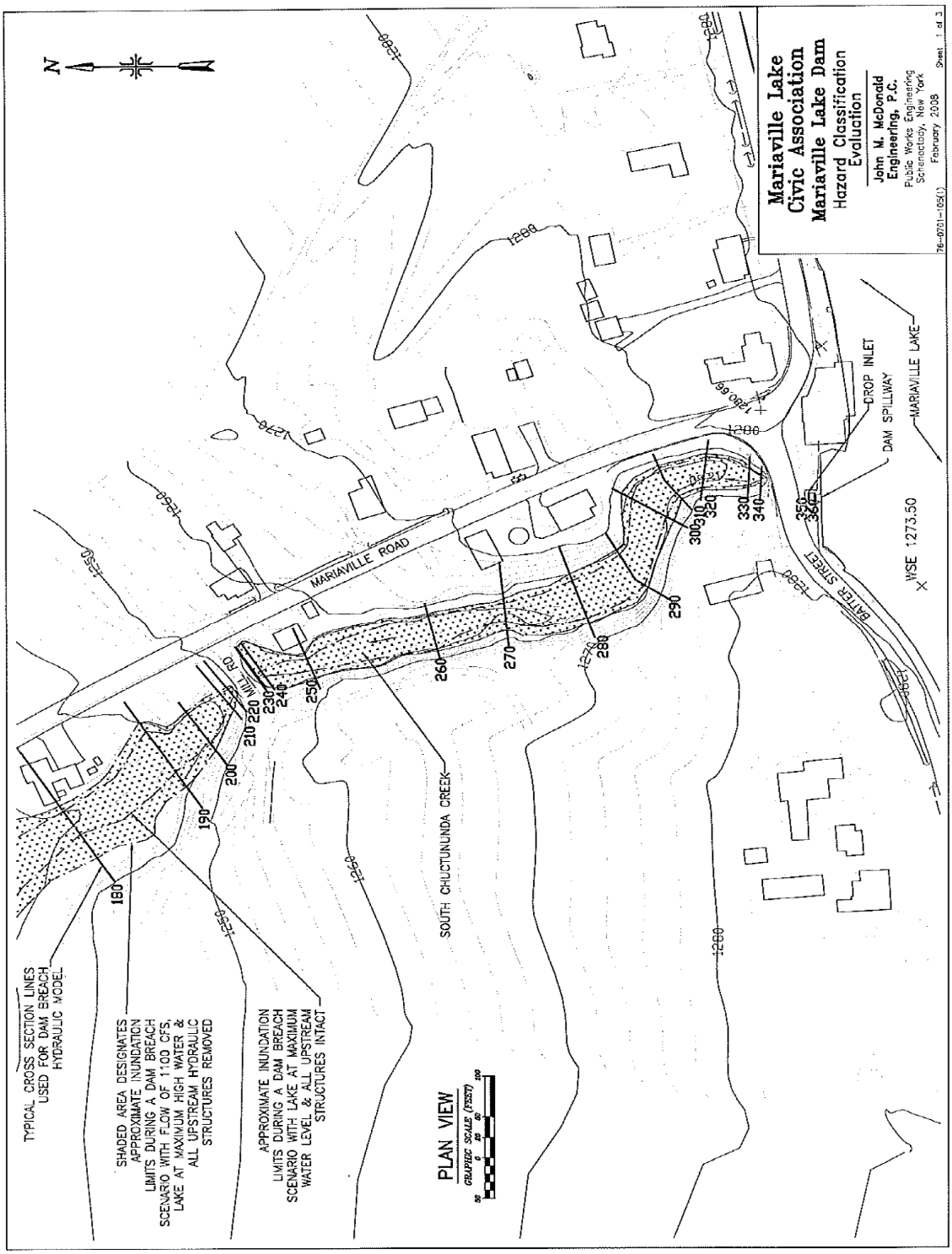
Locally available equipment, labor, and materials:
_____has the following resources that can be utilized in the event of an emergency:

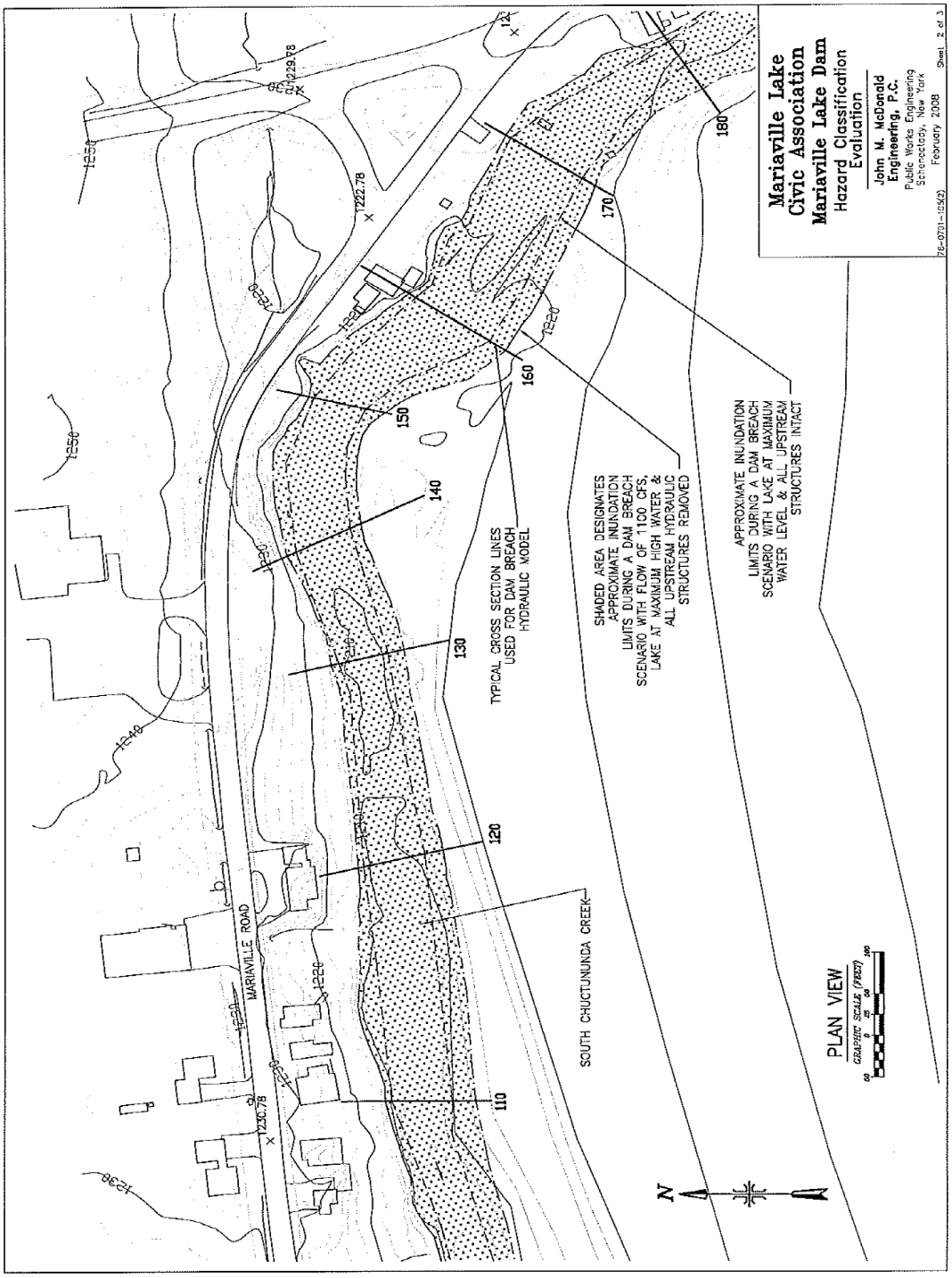
- _____
- _____
- _____
- _____
- _____

Other locally available resources include:

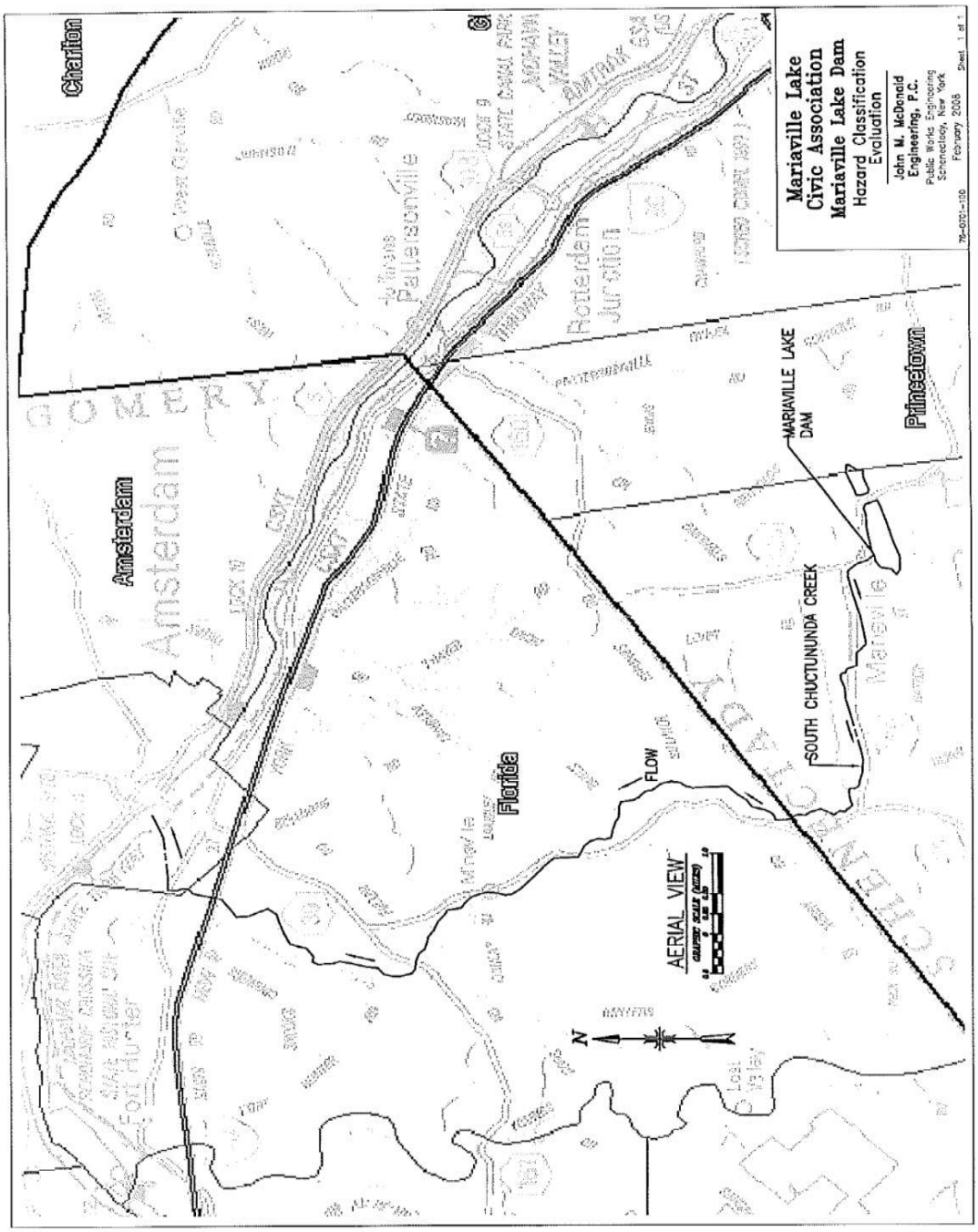
Heavy equipment service and rental	**Sand and gravel supply**	**Ready-mix concrete supply**
Pumps	**Diving contractor**	**Sand bags**

Appendix B–2
Location and Vicinity Maps

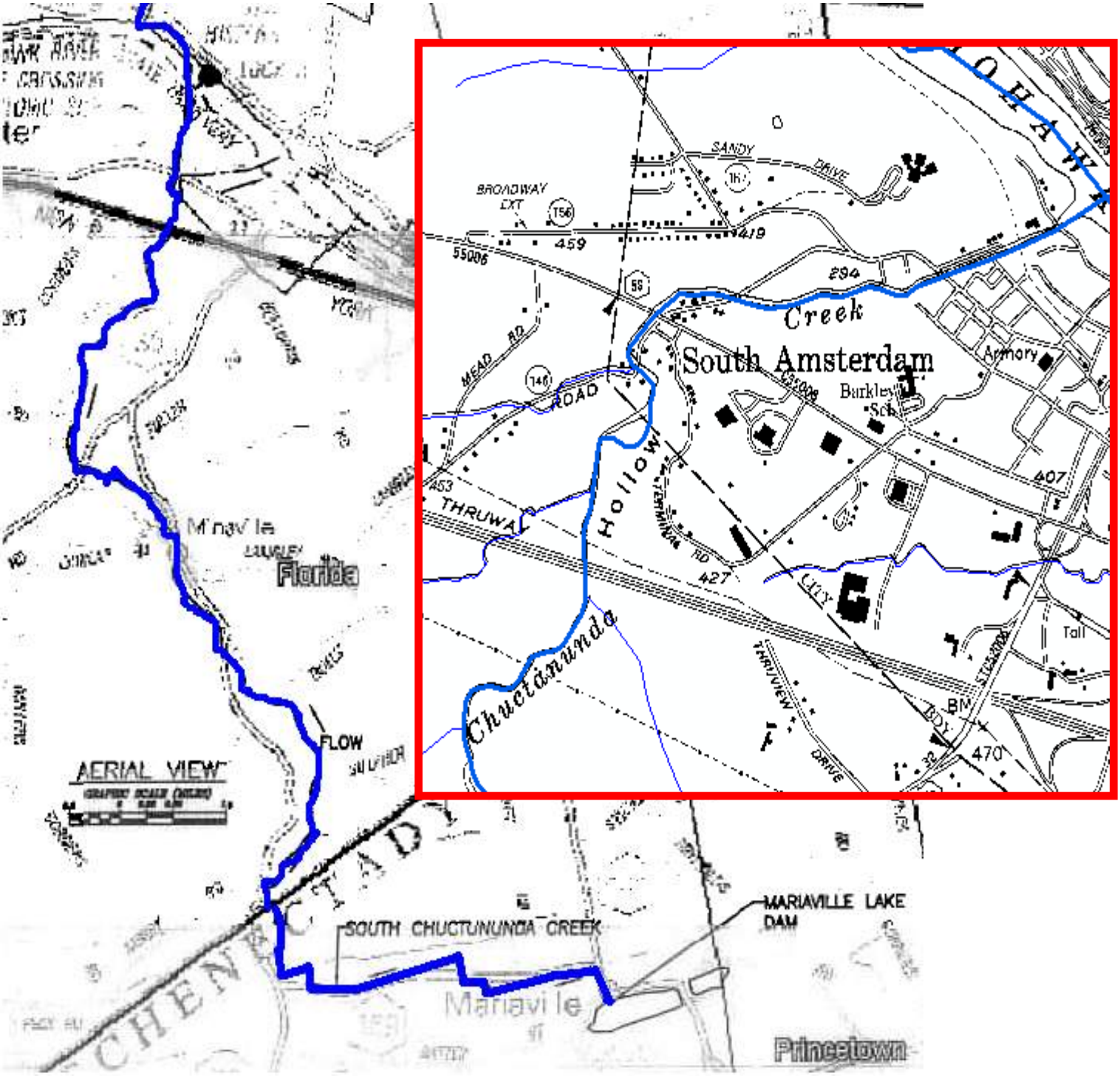

Mariaville Lake
Civic Association
Mariaville Lake Dam
Hazard Classification
Evaluation
John M. McDonald
Engineering, P.C.
Public Works Engineering
Schenectady, New York
February, 2008
Sheet 1 of 3
N
MARIAVILLE ROAD
MILL RD
SOUTH CHUCTUNUNDA CREEK
DAM SPILLWAY
DROP INLET
MARIAVILLE LAKE
BAXTER STREET
WSE 1273.50
PLAN VIEW
GRAPHIC SCALE (FEET)
TYPICAL CROSS SECTION LINES
USED FOR DAM BREACH
HYDRAULIC MODEL
SHADED AREA DESIGNATES
APPROXIMATE INUNDATION
LIMITS DURING A DAM BREACH
SCENARIO WITH FLOW OF 1100 CFS,
LAKE AT MAXIMUM HIGH WATER &
ALL UPSTREAM HYDRAULIC
STRUCTURES REMOVED
APPROXIMATE INUNDATION
LIMITS DURING A DAM BREACH
SCENARIO WITH LAKE AT MAXIMUM
WATER LEVEL & ALL UPSTREAM
STRUCTURES INTACT


Mariaville Lake
Civic Association
Mariaville Lake Dam
Hazard Classification
Evaluation
John M. McDonald
Engineering, P.C.
Public Works Engineering
Schenectady, New York
February 2008
Sheet 2 of 3
PLAN VIEW
GRAPHIC SCALE (FEET)
N
MARIAVILLE ROAD
SOUTH CHUCTUNUNDA CREEK
TYPICAL CROSS SECTION LINES USED FOR DAM BREACH HYDRAULIC MODEL
SHADED AREA DESIGNATES APPROXIMATE INUNDATION LIMITS DURING A DAM BREACH SCENARIO WITH FLOW OF 1100 CFS, LAKE AT MAXIMUM HIGH WATER & ALL UPSTREAM HYDRAULIC STRUCTURES REMOVED
APPROXIMATE INUNDATION LIMITS DURING A DAM BREACH SCENARIO WITH LAKE AT MAXIMUM WATER LEVEL & ALL UPSTREAM STRUCTURES INTACT
110
120
130
140
150
160
170
180

(Insert map)


Mariaville Lake
Civic Association
Mariaville Lake Dam
Hazard Classification
Evaluation
John M. McDonald
Engineering, P.C.
Public Works Engineering
Schenectady, New York
February 2008
Charlton
Amsterdam
Florida
Princetown
Rotterdam Junction
Pattersonville
MARIAVILLE LAKE DAM
SOUTH CHUCTUNUNDA CREEK
FLOW
AERIAL VIEW
N

Appendix B–3
Watershed Project Map



Appendix B–4
Evacuation Map

(Insert map)

Appendix B–5
Residents/Businesses/Highways at Risk

A major flood caused by a sudden breach of the dam is estimated to inundate six homes, one fire house, 1 school and two highways.

House/ business	Resident/business	Address	Phone no.	Residents		
B	Mariaville Fire Dept	Mariaville Road	911			
S	Mariaville Elementary School	9210 Mariaville Road, Pattersonville, NY	864-5411 or 895-2137	Rental Property with several occupants		
H	Pam& Rich Garrabrant	8915 Mariaville Road	716-523-7673	2		
H	Anthony Ciccone	9037 Mariaville Road	864-5093	3		
H	Abandoned House			0		
H	Bill & Nancy O'Dell	9180 Mariaville Road	NO PHONE	4		
H	Gary Gilbert	9150 Mariaville Road	864-5654	3		
	Route 160 at the intersection of 160&159					
	Route 159 toward Rt 30					

Appendix B–6
Plan View of Dam

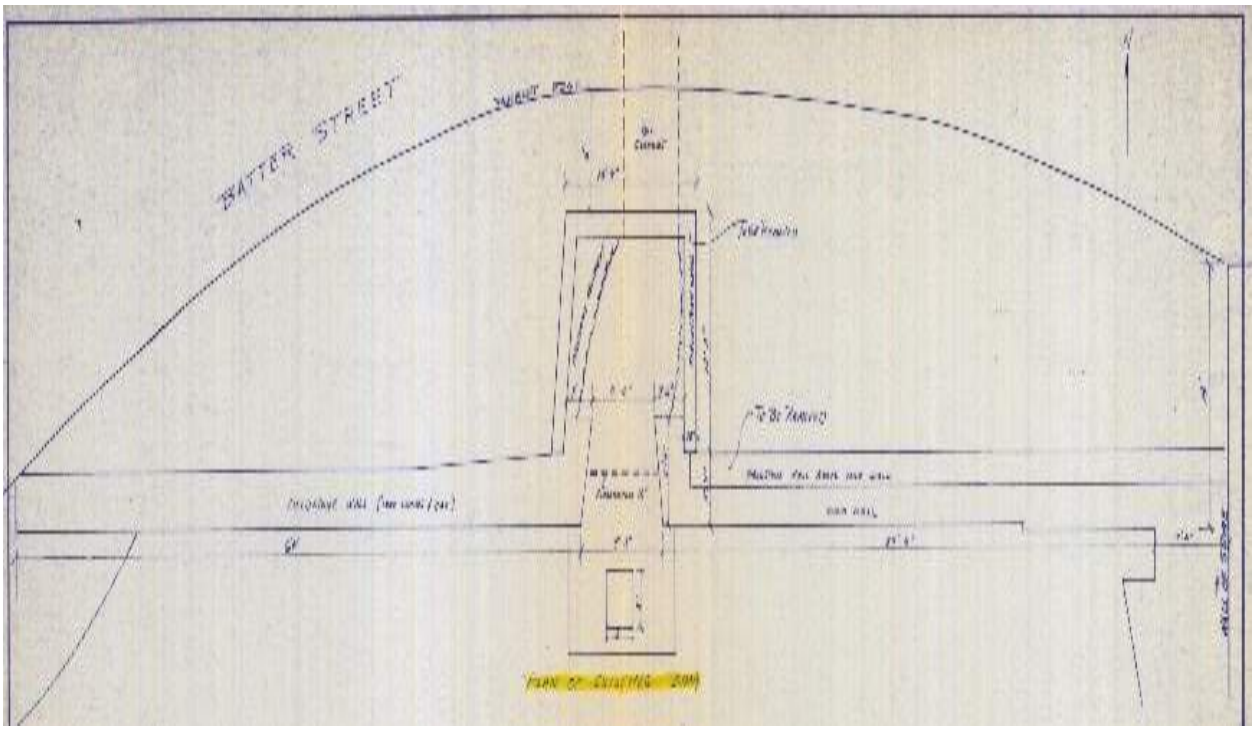
In flow of the MCA Dam 11/07

High water outflow into the Creek 11/07

Box Culvert during High water conditions 11/07

Water flows during High water conditions 11/07

Appendix B–7
Profile of Principal Spillway



Appendix B–9
National Inventory of Dams (NID) Data

Dam name: **Mariaville Lake Dam**

State: **NY**

NYS ID #: **189-224**

Longitude: **E74,08",08"**

Latitude: **N42,49'42"**

County: **Schenectady**

Stream: **Chuncaganga Creek**

Nearest town: **Mariaville**

Operator: **Mariaville Civic Association**

Year constructed: **1989**

Max. Discharge: **286 cfs, flow over spillway**

Auxiliary Spillway: **151 cfs**

Total discharge prior to breach **437 cfs**

Lake storage Volume @ Top of abutment Walls (Vf) **1956 acre-ft**

Normal storage: **185 acre**

Surface of Lake @ top of abutment Walls **195 acres**

Lake Storage Volume in cubic ft @ Normal Lake Level (Vn) **43,690,680 cf**

Inspection frequency: **1 yr**

State regulated?: **Yes**

State Regulating Agency: **NYS DEC**

Purpose of Dam: **Recreation and Irrigation**

Service life: **_50_ yrs**

O&M insp. resp.: **2017**

O&M insp. current?: **Yes**

Population at risk: **Potentially 150**

Dam height: **10 ft**

Dam length: **20.5 ft**

Design hazard potential: **Class C**

Hazard Classification: **C**

Flood storage: **1003 acre-ft**

Principal spillway type: **Concrete**

Auxiliary spillway width: **20.5 ft**

Important phone numbers

New York State Environmental Conservation
Dam Safety Division
625 Broadway,
4th Floor
Albany, NY 12233-3504
Att: Joe Albert

Division of Water Bureau of Flood Protection and Dam Safety		(518) 402-8151
Scott Burskowsk	Mariaville Fire Chief	(911)
Chief Brodie	Duanesburg Ambulance (if needed)	(911)
Bill Wenzel	Town Supervisor	(518) 895-2331
	Town Code Enforcement Officer	(518) 895-2040 EXT 108
Sheriff Dagostino	County Sheriff	(518) 388-4300
Schenectady County Emergency Management	Mark Violette *Director*	Phone: (518) 370-3113 x1
SEMO	State Emergency Management (if needed)	(518) 457-8900
	Holidays & Weekends	(518) 457-2200
State Police	(if needed) Prince town	(518) 630-1700
Homeland Security	Watch center	518-292-2200

NY Dam Safety			518-402-8151
KB Engineering and Architecture, PC	Douglas Cole		518-348-7880 (Office)
New York State Canal Corporation	www.canals.ny.gov	200 Davis Ave, Waterford, NY 12188	518-270-8400

NYSCC_NYPA
Tertiary EAP Request

SEE ATTACHED TOWN EMERGENCY NOTIFICATION LIST

April 14, 2022

Re: **Emergency Action Plan – Plan Holder and Emergency Notification Update Request Mariaville Lake Dam - Town of Duanesburg, Schenectady County DEC Dam ID#: 189-0224**

Dear Robert Cuttita,
Dam Safety Officer
Mariaville Civic Association
794 South Shore Road
Delanson, New York 12053

The New York State Canal Corporation ("Corporation") completed a state-wide desktop study of New York State Department of Environmental Conservation (NYSDEC)-listed Class B – Intermediate and Class C – High Hazard dams located within watersheds draining into the New York State Canal System (Erie, Cayuga-Seneca, Champlain, Oswego Canals), a waterbody containing Corporation assets, or a waterbody where the Corporation has jurisdiction for navigation or water management.

With permission from the NYSDEC's Dam Safety Program, we reviewed a copy of your Emergency Action Plan (EAP) for the Mariaville Lake Dam located in the Town of Duanesburg, Schenectady County. Mariaville Lake Dam was confirmed to have potential impacts to Canal operations within the Erie Canal.

The Corporation requests, at the next earliest convenience, that the Mariaville Civic Association update the distribution list and emergency notification flowchart in the Mariaville Lake Dam EAP with the following information to ensure the notification information is complete and accurate, should an emergency occur.

Additionally, please acknowledge your receipt of this request by returning a signed copy of the attached "EAP Update Request Acknowledgement Form".

NYS Canal Corporation Contact Information for EAP Distribution:

NYS Canal Corporation^
Joseph Moloughney
Eastern Regional Canal Engineer
30 South Pearl Street, 5th Floor
Albany, NY 12207
Joseph.Moloughney@canals.ny.gov

New York Power Authority^
Barry Anctil
EAP Coordinator
30 South Pearl Street, 10th Floor
Albany, NY 12207
Barry.Anctil@nypa.gov

EAP@canals.ny.gov

NYS Canal Corporation Emergency Notification Flowchart Information:

The Corporation appreciates your cooperation regarding the management of public safety. If you have any questions, please feel free to contact me at David.Mellen@nypa.gov or 315-423-2088.

Sincerely,
David R. Mellen, P.E.
Regional Manager, Canals Region (NYPA)

NOTE: Make call to next contact if you cannot reach required contact.
NYS CANAL CORPORATION
Canal Corporation Emergency Call Center
(CCECC) 24 HRS
1-833-538-1042
or
Joseph Moloughney
Eastern Regional Canal Engineer
24 HRS: 518-225-2877

EXHIBIT I
SINKHOLE PHOTOGRAPHS

Sinkhole behind western dam abutment as discovered on 9/30/23

Lake water surface elevation below sinkhole area

Schenectady County began repair work on 10/4/23

Repairs made by Schenectady County

Repairs made by Schenectady County

Repairs made by Schenectady County

Finished repair

EXHIBIT J
PROPOSED REPAIR SCHEDULE

Mariaville Lake Civic Association
Mariaville Lake Dam
Dam Repair Schedule

KB Engineering & Architecture, P.C.
11/6/2024

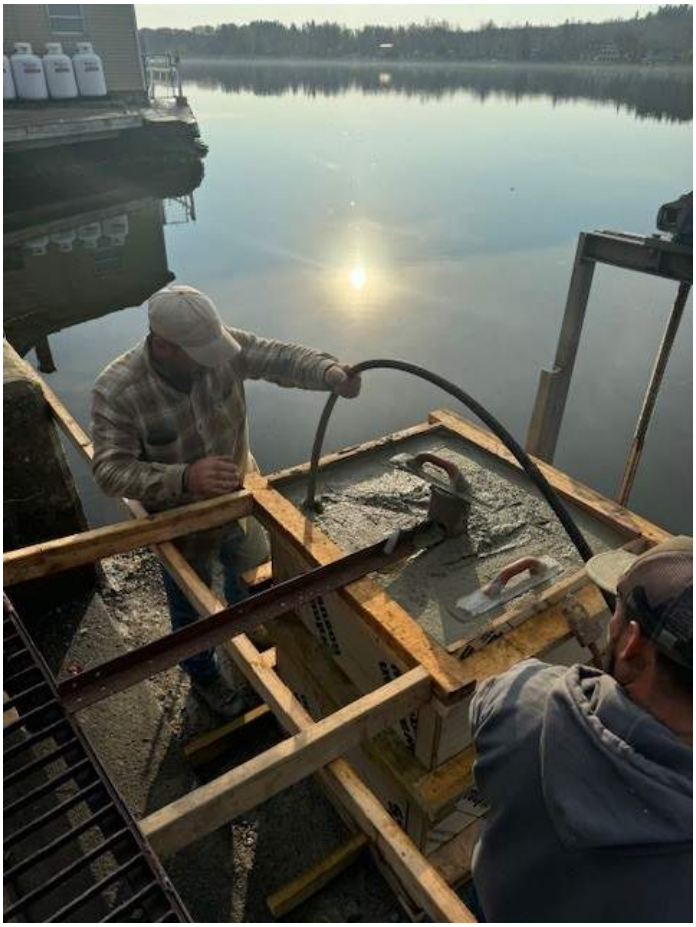
Task	Scheduled Completion
Repair spalled areas of concrete encasing the abandoned low level outlet valve	Completed Nov-24
Repair spalled area above the spillway on the eastern side of the dam.	Completed Nov-24
Seal cracks on headwall structure.	Completed Nov-24
Replace lag bolts in slide gate frame	Completed Nov-24
Remove vegetation from upstream dam face	May-25
Mow downstream embankment	Oct-25

EXHIBIT K
NOVEMBER 2024 REPAIR WORK PHOTOGRAPHS

Demolished concrete around abandoned low level outlet valve

Forms and new rebar for new concrete around abandoned low level outlet valve

New concrete pour around abandoned low level outlet valve



New concrete pour around abandoned low level outlet valve

Completed repair work

Completed repair work

Completed repair work