



EMERGENCY ACTION PLANS

Monitoring and Emergency Warning Procedures

For The

BOULTER POND DAM

MIDDLE POND DAM

BELL MARSH DAM

Located In The

TOWN OF YORK, YORK County, MAINE

OWNED, OPERATED AND MAINTAINED

By The

KITTERY WATER DISTRICT

17 STATE ROAD

KITTERY, MAINE 03904

Tel: (207) 439-1128

Revised February 2021



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**NATIONAL ID #: ME00194
STATE ID #: 05124
MEMA ID #: 015**

OWNED, OPERATED AND MAINTAINED

By The
KITTERY WATER DISTRICT
17 STATE ROAD
KITTERY, MAINE 03904
Tel: (207) 439-1128

*Prepared By Sevee & Maher Engineers, Inc.
Cumberland Center, Maine*

Revision Date – February 2021 by Kittery Water District

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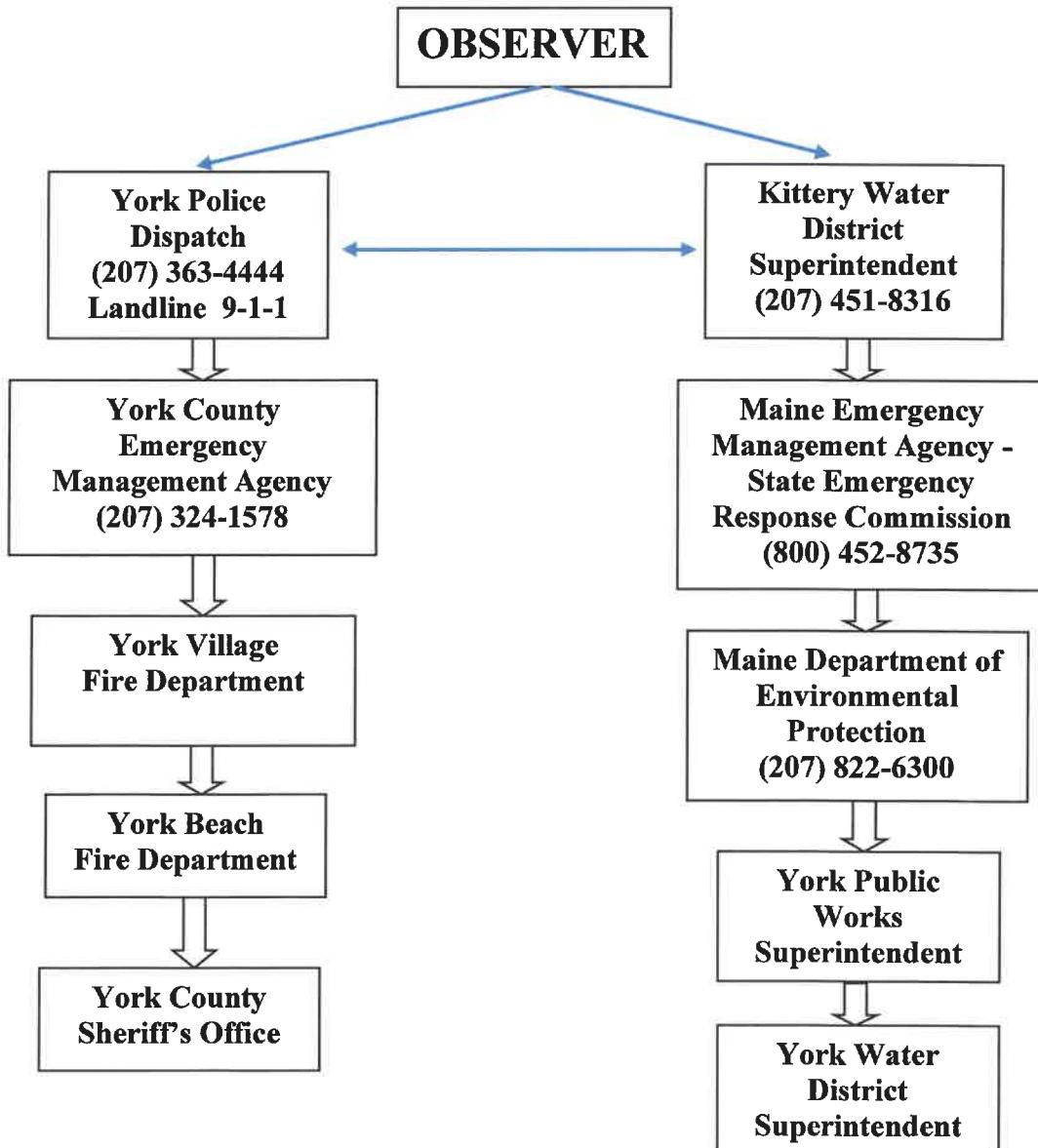
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PART I. NOTIFICATION FLOWCHART, BOULTER POND DAM EMERGENCY ACTION PLAN

Message to Inundation Zone Residences: “Hello, this is _____, and this is an emergency. The Boulter Pond Dam has failed / is failing. You may be in the Area of Potential Flooding zone. Please alert neighbors and anyone in the vicinity of Bass Cove Brook. Authorities and others are being notified. **THIS IS NOT A DRILL!**”

Message to Responders: “Hello, this is _____, and this is an emergency. The Boulter Pond Dam has failed / is failing. Please activate your EAP Alert / Notification List and EAP Procedures.”

EMERGENCY NOTIFICATION FLOWCHART



PART II**STATEMENT OF PURPOSE AND DISTRIBUTION**
BOULTER POND DAM EMERGENCY ACTION PLAN**1. Purpose**

This Emergency Action Plan will provide:

- a systematic means to identify emergency conditions,
- a collective and effective response to mitigate the situation, and
- a minimized loss of life and property damage in the event of a failure.

The sudden release of water stored behind the Boulter Pond Dam may present a potential hazard to downstream inhabitants and property. To minimize the chances for loss of life and damage to property, it is important to respond quickly to a potentially hazardous situation and to provide a coordinated effort that clearly assigns major areas of responsibility.

The first few minutes of time following the observance or realization of an actual or impending failure often make the difference between disjointed and ineffective actions and a coordinated and effective response. It is essential that the proper organizations and agencies be notified on a timely basis so that properly trained people can perform the functions they are qualified to do. Local responders have been involved in the development of this plan, and it is exercised annually.

2. Distribution

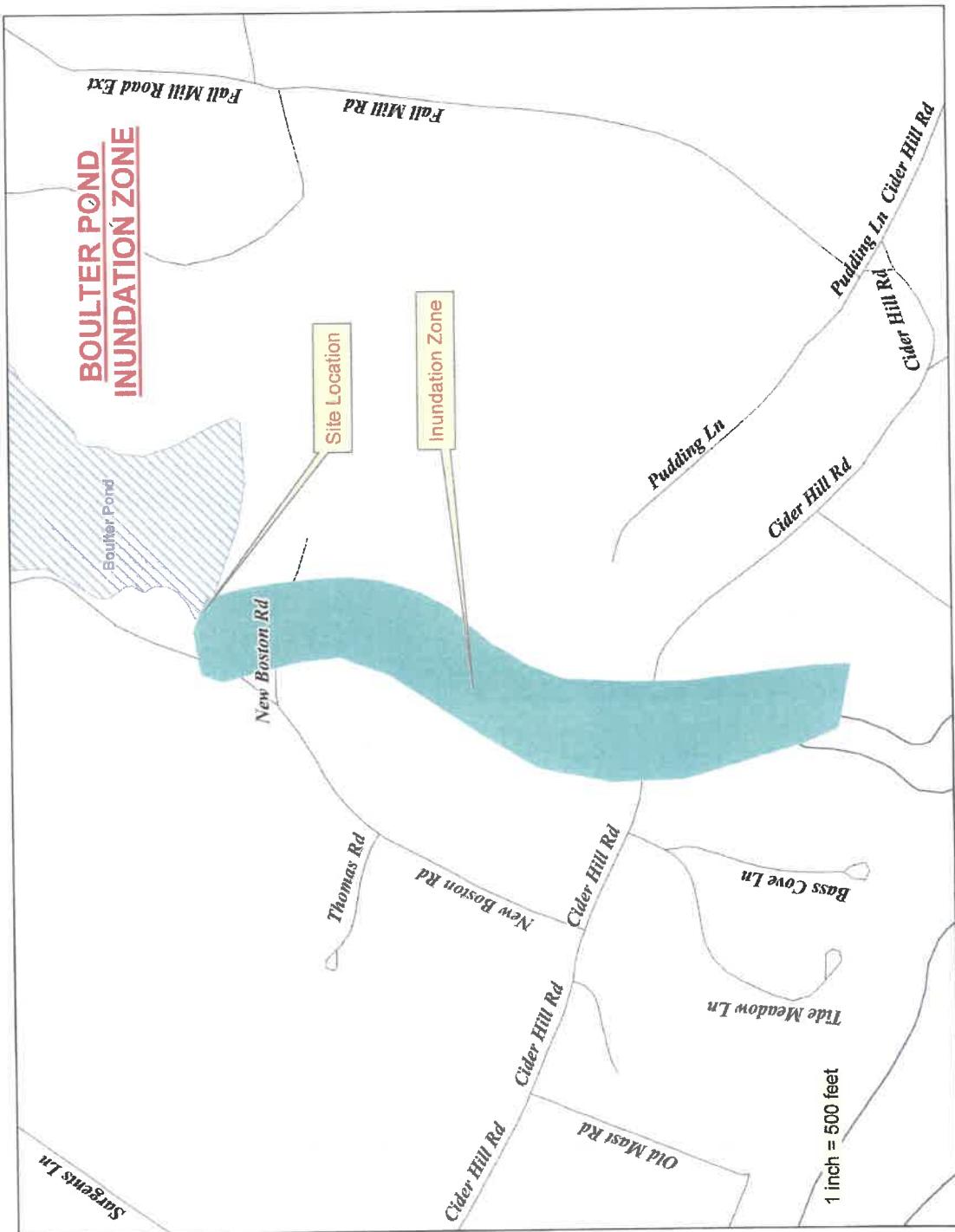
- a. This Emergency Action Plan including the Notification Flowchart will be distributed to each of the following locations and will be readily available within the first downstream inhabited structure or facility equipped with a telephone, and at the following locations:
 1. Kittery Water District Office,
 2. Kittery Water District Water Treatment Facility,
 3. York Police Department,
 4. York Village Fire Department,
 5. York Town Office,
 6. Maine State Police,
 7. York County Sheriff Department,
 8. York County Emergency Management Agency, and
 9. Maine Emergency Management Agency.
- b. The Dam owners / operators should keep a copy of the Notification Flowchart with them at all times. There will also be a copy kept in the Superintendent's vehicle.

PART III

PROJECT DESCRIPTION BOULTER POND DAM EMERGENCY ACTION PLAN

The Boulter Pond Dam is located adjacent to the Francis Hatch Water Treatment Facility, the spillway from the impoundment forms a tributary of the York River in the Town of York, York County, Maine. An area between the dam and the York River in the Town of York, Maine would be potentially affected by failure or flooding as the result of large releases from the Boulter Pond Dam. A section of Route # 91 between Cider Hill Road and New Boston Road may become flooded and be impassible.

Figure 1 is a location plan of the dam and the Area of Potential Flooding zone. The dam was built in 1951. Whitman and Howard, Inc. was the designer. The dam is an earth dam with a concrete core wall which extends to bedrock and it has a maximum height of 70 feet. The spillway structure is a concrete broad crested weir which discharges to a bedrock/rip rap/cable concrete channel. It is 1,045 feet long and 31 feet high. The impoundment has a total surface area of 102 acres. The watershed contributing to this dam is characterized by wooded terrain. The maximum water storage is 400 million gallons. This dam was last inspected by Matt Muzzy, P.E. of Sevee & Maher Engineers, Inc. on November 17, 2020.



PART IV

EMEGENCY CONDITIONS, BOULTER POND DAM EMERGENCY ACTION PLAN

The following Emergency Conditions description contains standard terminology for reporting and action. These actions must be addressed to ensure rapid and appropriate response to potential emergency conditions. This part defines these conditions and specifies actions and responsibilities, and identifies who accomplishes them.

A. Monitoring / Maintenance

NORMAL CONDITIONS: Normal conditions are defined as periods of dry weather and occasional light rainfall. The Boulter Pond Dam will be field checked several times per month as recommended in the District's Operation & Maintenance Manual prepared by Whitman & Howard, Inc., GEI Consultants, Inc., H2O Engineering Consulting Associates, Inc and supplemented by Sevee & Maher Engineers, Inc. The checks will be performed using the checklist in the Operations and Maintenance Manual to verify that structural and mechanical elements are in working condition and present no abnormalities or hindrances to safe operation.

<u>Action</u>	<u>Responsibility</u>
• Periodic Inspections. Field check the dam and associated facilities several times per month using the O & M Manual inspection Checklist (appended)	Operations staff of the Kittery Water District as directed by Michael S. Rogers, Superintendent. Tel. (207) 439-1128
• Annual Inspection. Perform an annual inspection of the dam and associated facilities by a Registered Professional experienced in the design and construction of dams. These annual inspections are intended to reveal any slowly developing deficiencies.	Michael S. Rogers, Superintendent to contract for this service. Tel. (207) 439-1128
• Maintenance. Perform the recommended maintenance of the dam and associated facilities as required by the inspection reports.	Michael S. Rogers, Superintendent to contract for this service. Tel. (207) 439-1128

ADVERSE CONDITIONS: Adverse conditions are periods of heavy rainfall ($> 4"$ in 24 hours) or extended rainfall ($> 8"$ in 3 days), flash flood warnings, and/or heavy snow-melt. An additional adverse condition would be an earthquake. Inspection / surveillance frequency is increased during an event lasting more than 24 hours and immediately following the event (within 12 hours). The following table lists potential hazards and lists remedial measures to be undertaken.

Potential Hazards	Remedial Measures
<ul style="list-style-type: none"> • Overtopping or Loss of Freeboard: • This will cause erosion damage along the top of the dam. 	<ol style="list-style-type: none"> a. Sand bag any areas which have eroded. b. Lower the water level via outlet piping. c. Check the spillway for debris or ice impeding the flow of water down the spillway.
<ul style="list-style-type: none"> • Cracking, Excessive Settlement, Excessive Seepage or Piping: • This is caused by earth material being washed away below the surface of the structure 	<p>Look for excessive cloudy/turbid seepage,</p> <ol style="list-style-type: none"> a. Look for whirlpools along the upstream slope of the dam. b. Sand bag any areas which have eroded. c. Lower the water level via outlet piping.
<ul style="list-style-type: none"> • Slides on either the upstream or downstream slopes: • Earth slides can drastically change the stability of the earthen structure and also the flownet. 	<p>Use gravel or rip-rap to stabilize the structure,</p> <ol style="list-style-type: none"> a. Use plastic upstream and/or geotextile fabric downstream to slow the seepage. b. Lower the water level via outlet piping.
<ul style="list-style-type: none"> • Failure of Appurtenant Structures or excessive cracking of concrete: • This is indicative of a failed foundation. 	<ol style="list-style-type: none"> a. Contact the dam engineer. b. Monitor the rate of change.

Action

- **Inspection.** During a long duration adverse conditions event and within 12 hours immediately following the event perform an inspection of the dam and associated facilities.

Responsibility

Michael S. Rogers, Superintendent
or his appointee.
Tel. (207) 439-1128

- **Immediate Remedial Measures.** If the inspection of the dam and associated facilities reveals condition which can be arrested by emergency repairs, then initiate these as is necessary.

Kittery Water District as directed by Michael S. Rogers, Superintendent
Tel. (207) 439-1128

B. Response

STANDBY ALERT. This level of surveillance is generated by specific observed or reported onsite conditions such as those listed above. Primary and backup communications means should be employed at the site.

<u>Action</u>	<u>Responsibility</u>
• Constant Observation / Surveillance	Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
• Notify Authorities	Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128

Check when notified:

<input type="checkbox"/> Local Dispatcher (Police, Fire)	(207) 363-4444 or 911 within York
<input type="checkbox"/> Maine State Police	(800) 452-4664
<input type="checkbox"/> Dam Engineers (SME)	(207) 829-5016

ALERT MESSAGE: “Hello, this is _____. We are advising you that we are starting constant surveillance of the Boulter Pond Dam according to the dam’s Emergency Action Plan. We are notifying you _____ (agency) of this condition, and will inform you when a decision to activate the notification and evacuation process or cancel the surveillance is made.

- **Remedial Repairs.** Begin emergency repairs (if possible). The anticipated type of materials needed for repairs based on historical data or experience are as follows:

Kittery Water District as directed by Michael S. Rogers, Superintendent
Tel. (207) 439-1128

- * Sand Bags
- * Plastic Sheets
- * Rip Rap & Gravel and
- * Geotextile Fabric

These materials should be located and available to the District in the event of an emergency. Access to the site via Route # 91 between Cider Hill Road and New Boston Road should be considered very carefully.

<u>Action</u>	<u>Responsibility</u>
<ul style="list-style-type: none"> Provide periodic updates to authorities. As the emergency situation changes provide updated information. 	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
<u>NOTIFY / EVACUATE.</u> This action is taken when failure is imminent or has occurred.	
<ul style="list-style-type: none"> Activate Notification Flowchart Located in PART I. 	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
<ul style="list-style-type: none"> Assume command of incident. 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
<ul style="list-style-type: none"> Move people and equipment immediately downstream out of harms way. 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
<ul style="list-style-type: none"> Execute Evacuation Order, render assistance, account for missing persons, open shelters. 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
<ul style="list-style-type: none"> Report Site Conditions 	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
C. Recovery. Recovery begins when danger of high water has passed.	
<ul style="list-style-type: none"> Clear Routes of debris and/or repair washouts. 	Town of York Public Works Department Tel. (207) 363-1011
<ul style="list-style-type: none"> Reestablish Roads, Utilities & Services 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME <u>Town of York</u> Public Works Dept. Tel. (207) 363-1011 <u>Utilities</u> – Central Maine Power, Fairpoint Communications and Time Warner Cable

<u>Action</u>	<u>Responsibility</u>
• Assess Damage. Notify County Office of MEMA of assessments.	<u>Town of York</u> Public Works Dept. Tel. (207) 363-1011 <u>Homeowners</u>
• Terminate Event	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME

PART V

RESPONSIBILITIES. BOULTER POND DAM EMERGENCY ACTION PLAN

1. Dam Owner / Emergency Action Plan coordinator responsibilities.

The Boulter Pond Dam Owner and Emergency Action Plan coordinator is:

Kittery Water District
17 State Road
Kittery, Maine 03904
Tel. (207) 439-1128
Attn.: Michael S. Rogers, Superintendent

A. Planning Develop, maintain, post and distribute the Emergency Action Plan. Designate a primary observer if the dam is located remotely. Coordinate for primary dispatch and responder support for the Area of Potential Flooding zone alerting, warning and excavation.

B. Training Conduct annual communication checks to determine that the Notification Flowchart contacts are correct. Conduct a public awareness workshop to heighten awareness of the dam, its value and potential hazard to the downstream community.

C. Engineering Develop and maintain Area of Potential Flooding zone maps. Ensure that the Area of Potential Flooding zone residents or communities are aware of their evacuation procedures in the event of a dam failure.

D. Maintenance Ensure that the dam is inspected and maintained to protect against deterioration and failure.

E. Responding Respond to reported conditions at the dam, specify actions to take, and who will take them.

2. Observer / Operator Responsibilities.

The observer / operator is:

<u>Primary</u>	<u>Secondary</u>
Operations Staff	Operations Staff
Kittery Water District	Kittery Water District
17 State Road	28 New Boston Road
Kittery, Maine 03904	York, Maine 03909
Tel. (207) 439-1128	Tel. (207) 363-4252
Attn: Michael S. Rogers, Superintendent	Attn: Greg Chapman, Mark Rouillard

- a. Alert the District Superintendent to adverse conditions or failure conditions at the Boulter Pond Dam.
- b. Activate the Notification Flowchart if conditions warrant.

- c. Alert people in the Area of Potential Flooding zone of the dam of adverse conditions or imminent failure conditions.
- d. Keep Owner / Authorities informed of developing conditions.

3. Emergency Official / Responder Responsibilities.

The primary responder is: Town of York Dispatcher
37A Main Street
York Beach, Maine 03910
Tel. (207) 363-4444 or
911 within the Town of York

- a. Area of Potential Flooding zone emergency officials or responders are responsible for evacuating the Area of Potential Flooding zone when the Notification Flowchart is activated. The York on duty responder is the Incident Commander in the absence of other procedures.
- b. Participate in planning or training or coordination required to develop and maintain this plan.
- c. Be familiar with any special needs populations within the Area of Potential Flooding zone, and coordinate for evacuation support ahead of time.
- d. The Incident Commander is responsible for verifying that the hazard has passed, and terminating the event, including evacuation procedures.

4. Area of Potential Flooding Zone Resident, Visitor and stream user responsibilities.

For a listing of the current owners of property located in the Area of Potential Flooding Zone, see Appendix 3 – Property Owners in the Area of Potential Flooding Zone.

- a. Become familiar with the Evacuation procedures best suited for your location in the event of a dam failure.
- b. Be observant of stream conditions which may indicate an emergency situation.
- c. Assist your neighbors in reacting / excavating.
- d. Participate in or support the dam safety workshop in your area.
- e. Keep a copy of the Boulter Pond Dam EAP accessible and near a phone. Allow a responder or an observer to access the EAP and the phone in an emergency.

APPENDIX 1

PLAN FOR TRAINING, POSTING, & ANNUAL EXERCISING

BOULTER POND DAM EMERGENCY ACTION PLAN

APPENDIX 1

PLAN FOR TRAINING, POSTING, & ANNUAL EXERCISING BOULTER POND DAM EMERGENCY ACTION PLAN

Training

The Kittery Water District has conducted a “Workshop” meeting for the Emergency Planning for the Boulter Pond Dam. The District invited the stakeholders to attend and participate in the development of the plan. The District has developed an Emergency Action Plan document for the dam. The document includes the following:

- Notification Flowchart,
- Statement of Purpose,
- Project Description,
- Emergency Conditions Description,
- Stakeholder Responsibilities including planning, training, engineering maintenance and responding,
- Existing Inundation Mapping or USGS Topographic and Flood Plain Mapping to approximate the inundation area,
- Training Plan,
- Exercising, Drills and Testing Plan.

Posting

The EAP will be distributed to the Stakeholders and be available at the closest commercial establishment.

Annual Exercising

Annually the District will verify all of the telephone numbers on the Notification Flowchart to check for their accuracy. The District will also check the list of owners within the Area of Potential Flooding zone, and give any new owners an orientation of the mission and purpose of the EAP. The District will make any changes necessary to the EAP and redistribute the updated document.

APPENDIX 2

O & M MANUAL DAM INSPECTION CHECKLIST

BOULTER POND DAM EMERGENCY ACTION PLAN

Dam Inspections

Person performing inspection _____ *Date* _____

John Deere Gator CATV hour meter reading _____ *hours.*

1. Inspection of Boulter Pond Water Level _____ Ft. _____ Inches
Notes: _____

2. Inspection of the old chlorinator access roadway off Fall Mill extension

Has the property been accessed: No Yes

Notes: _____

3. Inspection of the Middle Pond access gate at Scituate Pond

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

4. Inspection of Middle Pond Dam Water Level _____ Ft. _____ Inches

Any public activity, trash, vandalism or fire rings encountered No Yes

Notes: _____

5. Inspection of Folly Pond Dam Water Level _____ Ft. _____ Inches

Any public activity, trash, vandalism or fire rings encountered No Yes

Notes: _____

6. Inspection of the Fall Mill Road extension gate

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

7. Inspection of the Kingsbury Lane gate off Route #91

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

8. Inspection of Smelt Brook Bridge access gate off Mill Lane

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

9. Inspection of the Bell Marsh Reservoir Dam Water Level _____ Ft.

_____ Inches

Any public activity, trash, vandalism or fire rings encountered No Yes

Notes: _____

Any damage to the main gates or chain link fencing No Yes

Notes: _____

APPENDIX 3

AREA OF POTENTIAL FLOODING ZONE **PROPERTY OWNERS**

BOULTER POND DAM EMERGENCY ACTION PLAN

NEW Map/Lot #	OLD MBLU	OWNER NAME	ADDRESS	CITY	STATE	ZIP	Telephone
213-119	90-45	Dorsey T. Mears III	161 Cider Hill Road	York	ME	03909	207-363-2132

Revised 2-14-21



EMERGENCY ACTION PLAN

Monitoring and Emergency Warning Procedures

For The

MIDDLE POND DAM

Located In The

TOWN OF YORK, YORK County, MAINE

**NATIONAL ID #: ME00190
STATE ID #: 05120
MEMA ID #: 017**

OWNED, OPERATED AND MAINTAINED

**By The
KITTERY WATER DISTRICT
17 STATE ROAD
KITTERY, MAINE 03904
Tel: (207) 439-1128**

**Prepared By Sevee & Maher Engineers, Inc.
Cumberland Center, Maine**

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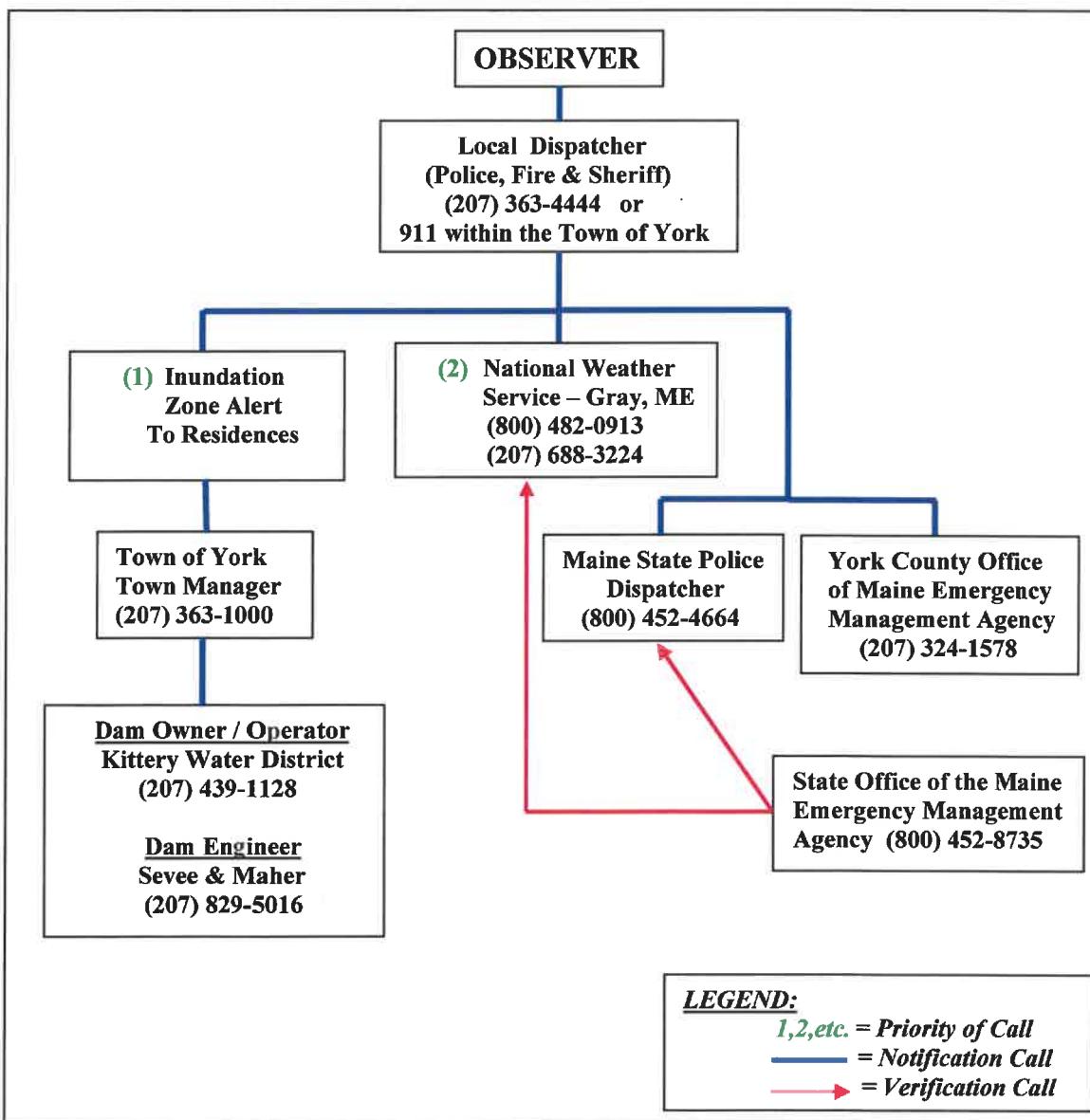
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PART I. NOTIFICATION FLOWCHART, MIDDLE POND DAM EMERGENCY ACTION PLAN

Message to Inundation Zone Residences: “Hello, this is _____, and this is an emergency. The Middle Pond Dam has failed / is failing. You may be in the inundation zone. Please alert neighbors and anyone in the vicinity of Fall Mill Creek. Authorities and others are being notified. THIS IS NOT A DRILL!”

Message to Responders: “Hello, this is _____, and this is an emergency. The Middle Pond Dam has failed / is failing. Please activate your EAP Alert / Notification List and EAP Procedures.”



PART II**STATEMENT OF PURPOSE AND DISTRIBUTION,
MIDDLE POND DAM EMERGENCY ACTION PLAN****1. Purpose**

This Emergency Action Plan will provide:

- a systematic means to identify emergency conditions,
- a collective and effective response to mitigate the situation, and
- a minimized loss of life and property damage in the event of a failure.

The sudden release of water stored behind the Middle Pond Dam may present a potential hazard to downstream inhabitants and property. To minimize the chances for loss of life and damage to property, it is important to respond quickly to a potentially hazardous situation and to provide a coordinated effort that clearly assigns major areas of responsibility.

The first few minutes of time following the observance or realization of an actual or impending failure often make the difference between disjointed and ineffective actions and a coordinated and effective response. It is essential that the proper organizations and agencies be notified on a timely basis so that properly trained people can perform the functions they are qualified to do. Local responders have been involved in the development of this plan, and it is exercised annually.

2. Distribution

- a. This Emergency Action Plan including the Notification Flowchart will be distributed to each of the following locations:
 1. Kittery Water District Office,
 2. Kittery Water District Water Treatment Facility,
 3. York Police Department,
 4. York Village Fire Department,
 5. York Town Office,
 6. Maine State Police,
 7. York County Sheriff Department,
 8. York County Emergency Management Agency, and
 9. Maine Emergency Management Agency.
- b. The Dam owners / operators should keep a copy of the Notification Flowchart with them at all times. There will also be a copy kept in the Superintendent's vehicle.

PART III

PROJECT DESCRIPTION

MIDDLE POND DAM EMERGENCY ACTION PLAN

The Middle Pond Dam is located in a remote area requiring a 20 minute ride on dirt roads to access it. The spillway from the impoundment forms Cider Hill Creek, a tributary of the York River in the Town of York, York County, Maine. An area between the dam and the York River in the Town of York, Maine would be potentially affected by failure or flooding as the result of large releases from the Middle Pond Dam. A section of Fall Mill Road and Route # 91 between Cider Hill Road and the Maine Turnpike may become flooded and be impassible.

Figure 1 is a location plan of the dam and the Area of Potential Flooding zone. The dam was built in 1901. Whitman and Howard, Inc. was the designer of renovations to the dam in 1948 +/- and 1993. Sargent Corporation was the constructor of the last dam rehabilitation which consisted of a rockfill on both sides of the masonry core structure. The dam has a concrete spillway and a chute created from blasted bedrock. The dam and an adjacent earthen dike are 517 feet long and 31 feet high. The impoundment has a total surface area of 77 acres. The watershed contributing to this dam is characterized by wooded terrain. The maximum water storage is 594 million gallons. This dam was last inspected by Matt Muzzy, P.E. of Sevee & Maher Engineers, Inc. on November 17, 2020.

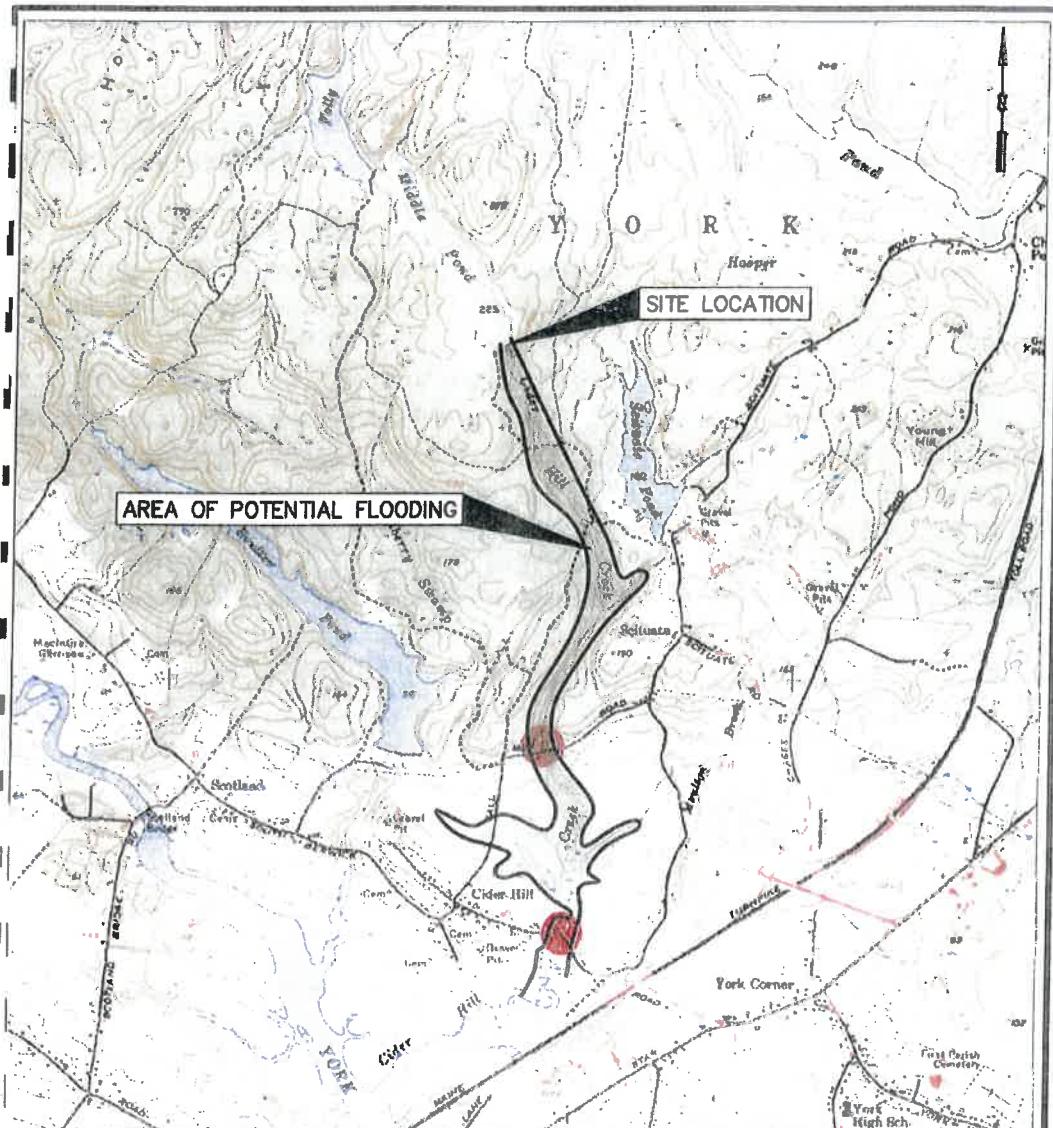


FIGURE 1
SITE LOCATION
MIDDLE POND DAM
KITTERY WATER DISTRICT

SME Sevee & Maher Engineers, Inc.

IG: DAMS LA.CFG. MIDDLE REV. 9/20/99

PART IV

EMEGENCY CONDITIONS, MIDDLE POND DAM EMERGENCY ACTION PLAN

The following Emergency Conditions description contains standard terminology for reporting and action. These actions must be addressed to ensure rapid and appropriate response to potential emergency conditions. This part defines these conditions and specifies actions and responsibilities, and identifies who accomplishes them.

A. Monitoring / Maintenance

NORMAL CONDITIONS: Normal conditions are defined as periods of dry weather and occasional light rainfall. The Middle Pond Dam will be field checked once per month. The checks will be performed using the checklist in the Operations and Maintenance Manual to verify that structural and mechanical elements are in working condition and present no abnormalities or hindrances to safe operation.

<u>Action</u>	<u>Responsibility</u>
• Periodic Inspections. Field check the dam and associated facilities several times per month using the O & M Manual inspection Checklist (appended)	Operations staff of the Kittery Water District as directed by Michael S. Rogers, Superintendent. Tel. (207) 439-1128
• Annual Inspection. Perform an annual inspection of the dam and associated facilities by a Registered Professional experienced in the design and construction of dams. These annual inspections are intended to reveal any slowly developing deficiencies.	Michael S. Rogers, Superintendent to contract for this service. Tel. (207) 439-1128
• Maintenance. Perform the recommended maintenance of the dam and associated facilities as required by the inspection reports.	Michael S. Rogers, Superintendent to contract for this service. Tel. (207) 439-1128

ADVERSE CONDITIONS: Adverse conditions are periods of heavy rainfall ($> 4"$ in 24 hours) or extended rainfall ($> 8"$ in 3 days), flash flood warnings, and/or heavy snow-melt. An additional adverse condition would be an earthquake. Inspection / surveillance frequency is increased during an event lasting more than 24 hours and immediately following the event (within 12 hours). The following table lists potential hazards and lists remedial measures to be undertaken.

Potential Hazards	Remedial Measures
<ul style="list-style-type: none"> • Overtopping or Loss of Freeboard: • This will cause erosion damage along the top of the dam. 	<ul style="list-style-type: none"> a. Lower the water level via outlet piping. b. Check the spillway for debris or ice impeding the flow of water down the spillway.
<ul style="list-style-type: none"> • Failure of Appurtenant Structures or excessive cracking of concrete: • This is indicative of a failed foundation. 	<ul style="list-style-type: none"> a. Contact the dam engineer. b. Monitor the rate of change.

<u>Action</u>	<u>Responsibility</u>
<ul style="list-style-type: none"> • Inspection. During a long duration adverse conditions event and within 12 hours immediately following the event perform an inspection of the dam and associated facilities. • Immediate Remedial Measures. If the inspection of the dam and associated facilities reveals condition which can be arrested by emergency repairs, then initiate these as is necessary. 	<p>Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128</p> <p>Kittery Water District as directed by Michael S. Rogers, Superintendent Tel. (207) 439-1128</p>

B. Response

STANDBY ALERT. This level of surveillance is generated by specific observed or reported onsite conditions such as those listed above. Primary and backup communications means should be employed at the site.

<u>Action</u>	<u>Responsibility</u>
• Constant Observation / Surveillance	Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
• Notify Authorities	Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128

Check when notified:

<input type="checkbox"/> Local Dispatcher (Police, Fire)	(207) 363-4444 or 911 within York
<input type="checkbox"/> Maine State Police	(800) 452-4664
<input type="checkbox"/> Dam Engineers (SME)	(207) 829-5016

ALERT MESSAGE: “Hello, this is _____. We are advising you that we are starting constant surveillance of the Middle Pond Dam according to the Dam’s Emergency Action Plan. We are notifying you _____ (agency) of this condition, and will inform you when a decision to activate the notification and evacuation process or cancel the surveillance is made.

• Remedial Repairs. Begin emergency repairs (if possible). The anticipated type of materials needed for repairs based on historical data or experience are as follows: <ul style="list-style-type: none"> * Sand Bags * Plastic Sheets * Rip Rap & Gravel and * Geotextile Fabric These materials should be located and available to the District in the event of an emergency. Access to the site via Route # 91 between Cider Hill Road and the Maine Turnpike should be considered very carefully. The potential for alternate routes may be necessary.	Kittery Water District as directed by Michael S. Rogers, Superintendent Tel. (207) 439-1128
• Provide periodic updates to authorities. As the emergency situation changes provide updated information.	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128

NOTIFY / EVACUATE. This action is taken when failure is imminent or has occurred.

<u>Action</u>	<u>Responsibility</u>
<ul style="list-style-type: none"> • Activate Notification Flowchart Located in PART I. 	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
<ul style="list-style-type: none"> • Assume command of incident. 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
<ul style="list-style-type: none"> • Move people and equipment immediately downstream out of harms way. 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
<ul style="list-style-type: none"> • Execute Evacuation Order, render assistance, account for missing persons, open shelters. 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
<ul style="list-style-type: none"> • Report Site Conditions 	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
C. Recovery. Recovery begins when danger of high water has passed.	
<ul style="list-style-type: none"> • Clear Routes of debris and/or repair washouts. 	<u>Town of York</u> Public Works Department Tel. (207) 363-1011
<ul style="list-style-type: none"> • Reestablish Roads, Utilities & Services 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME <u>Town of York</u> Public Works Dept. Tel. (207) 363-1011 <u>Utilities</u> – Central Maine Power, Fairpoint Communications and Time Warner Cable
<ul style="list-style-type: none"> • Assess Damage. Notify County Office of MEMA of assessments. 	<u>Town of York</u> Public Works Dept. Tel. (207) 363-1011 <u>Homeowners</u>
<ul style="list-style-type: none"> • Terminate Event 	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME

PART V

RESPONSIBILITIES, MIDDLE POND DAM EMERGENCY ACTION PLAN

1. Dam Owner / Emergency Action Plan coordinator responsibilities.

The Middle Pond Dam Owner and Emergency Action Plan coordinator is:

Kittery Water District
17 State Road
Kittery, Maine 03904
Tel. (207) 439-1128
Attn.: Michael S. Rogers, Superintendent

A. Planning Develop, maintain, post and distribute the Emergency Action Plan. Designate a primary observer if the dam is located remotely. Coordinate for primary dispatch and responder support for the Area of Potential Flooding zone alerting, warning and excavation.

B. Training Conduct annual communication checks to determine that the Notification Flowchart contacts are correct. Conduct a public awareness workshop to heighten awareness of the dam, its value and potential hazard to the downstream community.

C. Engineering Develop and maintain Area of Potential Flooding zone maps. Ensure that the Area of Potential Flooding zone residents or communities are aware of their evacuation procedures in the event of a dam failure.

D. Maintenance Ensure that the dam is inspected and maintained to protect against deterioration and failure.

E. Responding Respond to reported conditions at the dam, specify actions to take, and who will take them.

2. Observer / Operator Responsibilities.

The observer / operator is:

<u>Primary</u>	<u>Secondary</u>
Operations Staff Kittery Water District 17 State Road Kittery, Maine 03904 Tel. (207) 439-1128 Attn: Michael S. Rogers, Superintendent	Operations Staff Kittery Water District 28 New Boston Road York, Maine 03909 Tel. (207) 363-4252 Attn: Greg Chapman, Mark Rouillard

- a. Alert the District Superintendent to adverse conditions or failure conditions at the Middle Pond Dam.
- b. Activate the Notification Flowchart if conditions warrant.

- c. Alert people in the Area of Potential Flooding zone of the dam of adverse conditions or imminent failure conditions.
- d. Keep Owner / Authorities informed of developing conditions.

3. Emergency Official / Responder Responsibilities.

The primary responder is: Town of York Dispatcher
37A Main Street
York Beach, Maine 03910
Tel. (207) 363-4444 or
911 within the Town of York

- a. Area of Potential Flooding zone emergency officials or responders are responsible for evacuating the Area of Potential Flooding zone when the Notification Flowchart is activated. The York on duty responder is the Incident Commander in the absence of other procedures.
- b. Participate in planning or training or coordination required to develop and maintain this plan.
- c. Be familiar with any special needs populations within the Area of Potential Flooding zone, and coordinate for evacuation support ahead of time.
- d. The Incident Commander is responsible for verifying that the hazard has passed, and terminating the event, including evacuation procedures.

4. Area of Potential Flooding Zone Resident, Visitor and stream user responsibilities.

- a. There are no known properties requiring notification.

APPENDIX 1

PLAN FOR TRAINING, POSTING, & ANNUAL EXERCISING

MIDDLE POND DAM EMERGENCY ACTION PLAN

APPENDIX 1

PLAN FOR TRAINING, POSTING, & ANNUAL EXERCISING MIDDLE POND DAM EMERGENCY ACTION PLAN

Training

The Kittery Water District has conducted a “Workshop” meeting for the Emergency Planning for the Middle Pond Dam. The District invited the stakeholders to attend and participate in the development of the plan. The District has developed an Emergency Action Plan document for the dam. The document includes the following:

- Notification Flowchart,
- Statement of Purpose,
- Project Description,
- Emergency Conditions Description,
- Stakeholder Responsibilities including planning, training, engineering maintenance and responding,
- Existing Inundation Mapping or USGS Topographic and Flood Plain Mapping to approximate the inundation area,
- Training Plan,
- Exercising, Drills and Testing Plan.

Posting

The EAP will be distributed to the Stakeholders and be available at the closest commercial establishment.

Annual Exercising

Annually the District will verify all of the telephone numbers on the Notification Flowchart to check for their accuracy. The District will also check the list of owners within the Area of Potential Flooding zone, and give any new owners an orientation of the mission and purpose of the EAP. The District will make any changes necessary to the EAP and redistribute the updated document.

APPENDIX 2

O & M MANUAL DAM INSPECTION CHECKLIST

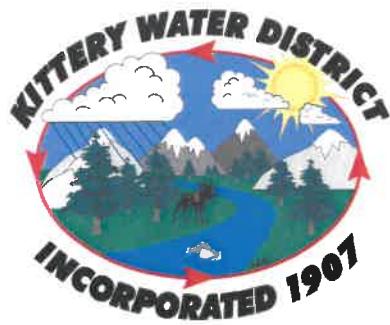
MIDDLE POND DAM EMERGENCY ACTION PLAN

Dam Inspections

Person performing inspection _____ *Date* _____

John Deere Gator CATV hour meter reading _____ *hours.*

1. **Inspection of Boulter Pond** Water Level _____ Ft. _____ Inches
Notes: _____
2. **Inspection of the old chlorinator access roadway off Fall Mill extension**
Has the property been accessed: No Yes
Notes: _____
3. **Inspection of the Middle Pond access gate at Scituate Pond**
Any noticeable damage to the gate, lock or signs No Yes
Notes: _____
4. **Inspection of Middle Pond Dam** Water Level _____ Ft. _____ Inches
Any public activity, trash, vandalism or fire rings encountered No Yes
Notes: _____
5. **Inspection of Folly Pond Dam** Water Level _____ Ft. _____ Inches
Any public activity, trash, vandalism or fire rings encountered No Yes
Notes: _____
6. **Inspection of the Fall Mill Road extension gate**
Any noticeable damage to the gate, lock or signs No Yes
Notes: _____
7. **Inspection of the Kingsbury Lane gate off Route #91**
Any noticeable damage to the gate, lock or signs No Yes
Notes: _____
8. **Inspection of Smelt Brook Bridge access gate off Mill Lane**
Any noticeable damage to the gate, lock or signs No Yes
Notes: _____
9. **Inspection of the Bell Marsh Reservoir Dam** Water Level _____ Ft. _____ Inches
Any public activity, trash, vandalism or fire rings encountered No Yes
Notes: _____
Any damage to the main gates or chain link fencing No Yes
Notes: _____



EMERGENCY ACTION PLAN

Monitoring and Emergency Warning Procedures

For The

BELL MARSH DAM

Located In The

TOWN OF YORK, YORK County, MAINE

**NATIONAL ID #: ME96040
STATE ID #: 05155
MEMA ID #: 175**

OWNED, OPERATED AND MAINTAINED

**By The
KITTERY WATER DISTRICT
17 STATE ROAD
KITTERY, MAINE 03904
Tel: (207) 439-1128**

**Prepared By Sevee & Maher Engineers, Inc.
Cumberland Center, Maine**

Revision Date – February 2021 by Kittery Water District

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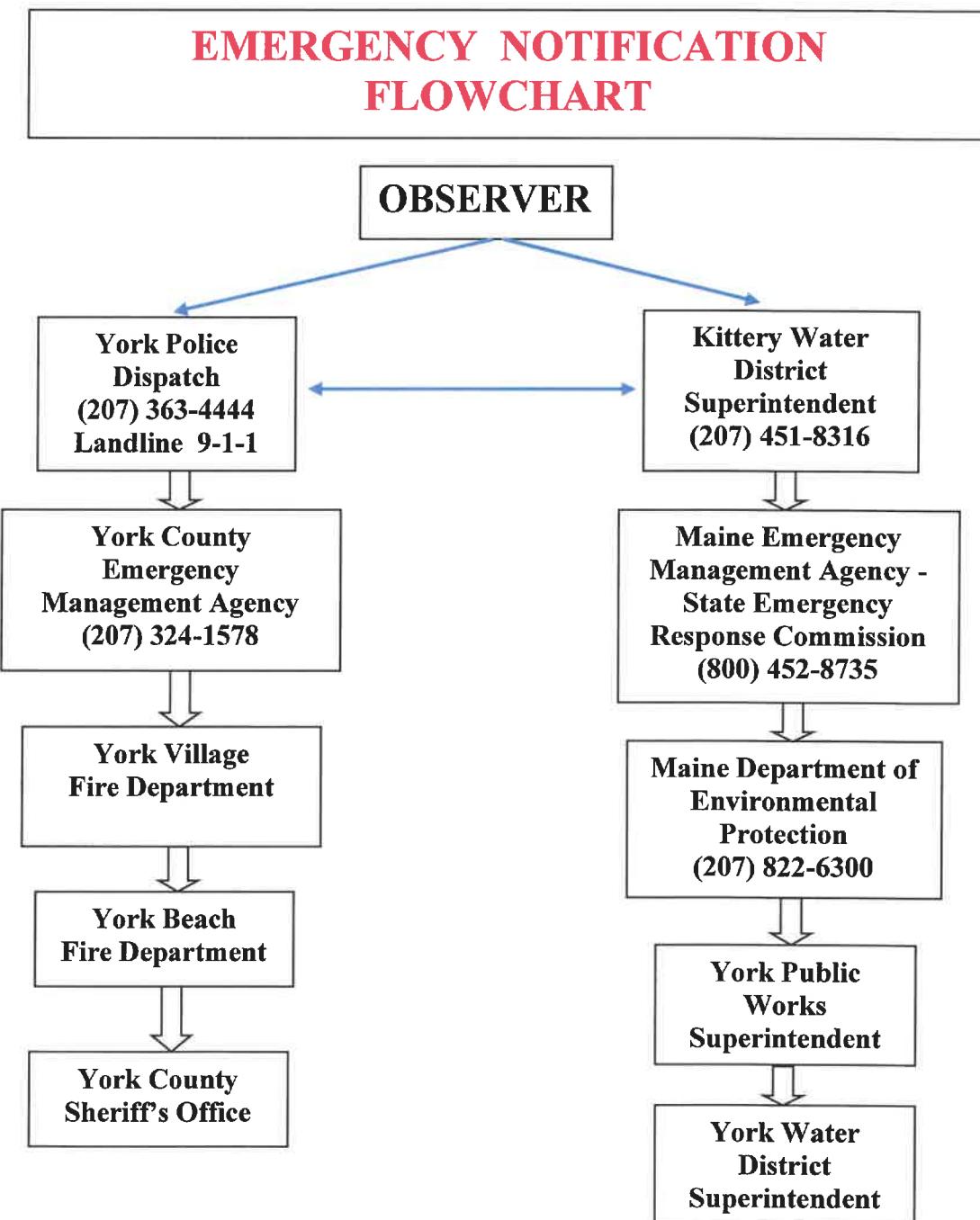
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PART I. NOTIFICATION FLOWCHART, BELL MARSH DAM EMERGENCY ACTION PLAN

Message to Inundation Zone Residences: "Hello, this is _____, and this is an emergency. The Bell Marsh Dam has failed / is failing. You may be in the inundation zone. Please alert neighbors and anyone in the vicinity of Smelt Brook. Authorities and others are being notified. THIS IS NOT A DRILL!"

Message to Responders: "Hello, this is _____, and this is an emergency. The Bell Marsh Dam has failed / is failing. Please activate your EAP Alert / Notification List and EAP Procedures."



PART II**STATEMENT OF PURPOSE AND DISTRIBUTION**
BELL MARSH DAM EMERGENCY ACTION PLAN**1. Purpose**

This Emergency Action Plan will provide:

- a systematic means to identify emergency conditions,
- a collective and effective response to mitigate the situation, and
- a minimized loss of life and property damage in the event of a failure.

The sudden release of water stored behind the Bell Marsh Dam may present a potential hazard to downstream inhabitants and property. To minimize the chances for loss of life and damage to property, it is important to respond quickly to a potentially hazardous situation and to provide a coordinated effort that clearly assigns major areas of responsibility.

The first few minutes of time following the observance or realization of an actual or impending failure often make the difference between disjointed and ineffective actions and a coordinated and effective response. It is essential that the proper organizations and agencies be notified on a timely basis so that properly trained people can perform the functions they are qualified to do. Local responders have been involved in the development of this plan, and it is exercised annually.

2. Distribution

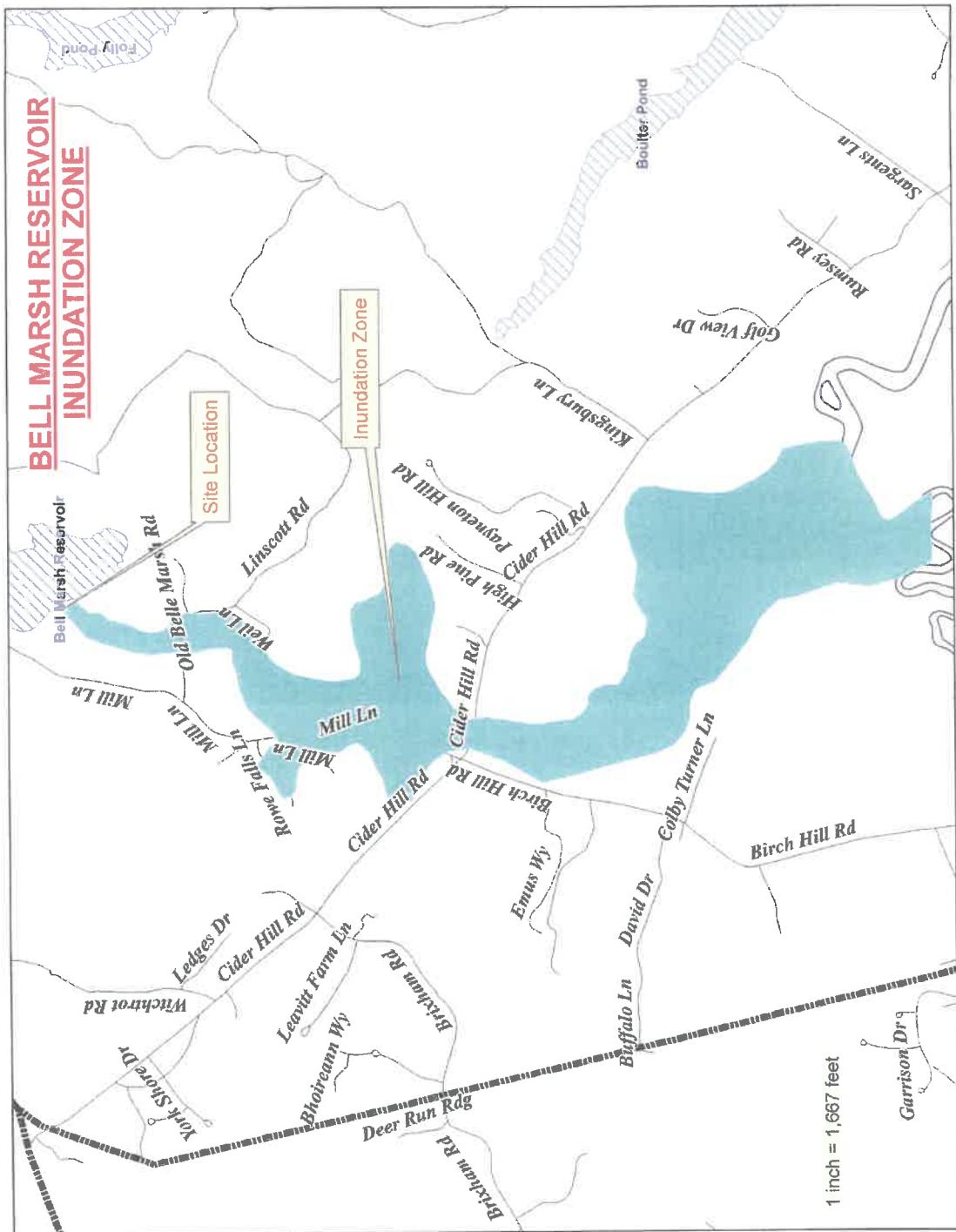
- a. This Emergency Action Plan including the Notification Flowchart will be distributed to each of the following locations and will be readily available within the first downstream inhabited structure or facility equipped with a telephone, and at the following locations:
 1. Kittery Water District Office,
 2. Kittery Water District Water Treatment Facility,
 3. York Police Department,
 4. York Village Fire Department,
 5. York Town Office,
 6. Maine State Police,
 7. York County Sheriff Department,
 8. York County Emergency Management Agency, and
 9. Maine Emergency Management Agency.
- b. The Dam owners / operators should keep a copy of the Notification Flowchart with them at all times. There will also be a copy kept in the Superintendent's vehicle.

PART III

PROJECT DESCRIPTION BELL MARSH DAM EMERGENCY ACTION PLAN

The Bell Marsh Dam is located on Smelt Brook, a tributary of the York River in the Town of York, York County, Maine. An area between the dam and the York River in the Town of York, Maine would be potentially affected by failure or flooding as the result of large releases from the Bell Marsh Dam. A section of Route # 91 just south of Mill Lane would become flooded and be impassible.

Figure 1 is a location plan of the dam and the inundation zone. The dam was built in 1987. Whitman and Howard, Inc. was the designer and H.E. Sargent, Inc. was the constructor of the dam. The dam consists of an earth-filled structure with a concrete spillway and a chute created from blasted bedrock. It is 1,400 feet long and 60 feet high. The impoundment has a total surface area of 240 acres. The watershed contributing to this dam is characterized by wooded terrain. The maximum water storage is 5,760 acre feet. This dam was last inspected by Matt Muzzy, P.E. of Sevee & Maher Engineers, Inc. on November 17, 2020.



PART IV

EMEGENCY CONDITIONS, BELL MARSH DAM EMERGENCY ACTION PLAN

The following Emergency Conditions description contains standard terminology for reporting and action. These actions must be addressed to ensure rapid and appropriate response to potential emergency conditions. This part defines these conditions and specifies actions and responsibilities, and identifies who accomplishes them.

A. Monitoring / Maintenance

NORMAL CONDITIONS: Normal conditions are defined as periods of dry weather and occasional light rainfall. The Bell Marsh Dam will be field checked several times per month as recommended in the District's Operation & Maintenance Manual prepared by Whitman & Howard, Inc., GEI Consultants, Inc., H2O Engineering Consulting Associates, Inc and supplemented by Sevee & Maher Engineers, Inc. The checks will be performed using the checklist in the Operations and Maintenance Manual to verify that structural and mechanical elements are in working condition and present no abnormalities or hindrances to safe operation.

<u>Action</u>	<u>Responsibility</u>
• Periodic Inspections. Field check the dam and associated facilities several times per month using the O & M Manual inspection Checklist (appended)	Operations staff of the Kittery Water District as directed by Michael S. Rogers, Superintendent. Tel. (207) 439-1128
• Annual Inspection. Perform an annual inspection of the dam and associated facilities by a Registered Professional experienced in the design and construction of dams. These annual inspections are intended to reveal any slowly developing deficiencies.	Michael S. Rogers, Superintendent to contract for this service. Tel. (207) 439-1128
• Maintenance. Perform the recommended maintenance of the dam and associated Facilities as required by the inspection reports.	Michael S. Rogers, Superintendent to contract for this service. Tel. (207) 439-1128

ADVERSE CONDITIONS: Adverse conditions are periods of heavy rainfall ($> 4"$ in 24 hours) or extended rainfall ($> 8"$ in 3 days), flash flood warnings, and/or heavy snow-melt. An additional adverse condition would be an earthquake. Inspection / surveillance frequency is increased during an event lasting more than 24 hours and immediately following the event (within 12 hours). The following table lists potential hazards and lists remedial measures to be undertaken.

Potential Hazards	Remedial Measures
<ul style="list-style-type: none"> • Overtopping or Loss of Freeboard: • This will cause erosion damage along the top of the dam. 	<ol style="list-style-type: none"> a. Sand bag any areas which have eroded. b. Lower the water level via outlet piping. c. Check the spillway for debris or ice impeding the flow of water down the spillway.
<ul style="list-style-type: none"> • Cracking, Excessive Settlement, Excessive Seepage or Piping: • This is caused by earth material being washed away below the surface of the structure 	<p>Look for excessive cloudy/turbid seepage,</p> <ol style="list-style-type: none"> a. Look for whirlpools along the upstream slope of the dam. b. Sand bag any areas which have eroded. c. Lower the water level via outlet piping.
<ul style="list-style-type: none"> • Slides on either the upstream or downstream slopes: • Earth slides can drastically change the stability of the earthen structure and also the flownet. 	<p>Use gravel or rip-rap to stabilize the structure,</p> <ol style="list-style-type: none"> a. Use plastic upstream and/or geotextile fabric downstream to slow the seepage. b. Lower the water level via outlet piping.
<ul style="list-style-type: none"> • Failure of Appurtenant Structures or excessive cracking of concrete: • This is indicative of a failed foundation. 	<ol style="list-style-type: none"> a. Contact the dam engineer. b. Monitor the rate of change.

Action

- **Inspection.** During a long duration adverse conditions event and within 12 hours immediately following the event perform an inspection of the dam and associated facilities.

Responsibility

Michael S. Rogers, Superintendent or his appointee.
Tel. (207) 439-1128

- **Immediate Remedial Measures.** If the inspection of the dam and associated facilities reveals condition which can be arrested by emergency repairs, then initiate these as is necessary.

Kittery Water District as directed by Michael S. Rogers, Superintendent
Tel. (207) 439-1128

B. Response

STANDBY ALERT. This level of surveillance is generated by specific observed or reported onsite conditions such as those listed above. Primary and backup communications means should be employed at the site. Surveillance of the dike should be done on a frequency determined by an inspection.

<u>Action</u>	<u>Responsibility</u>
• Constant Observation / Surveillance	Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
• Notify Authorities	Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128

Check when notified:

Local Dispatcher (Police, Fire) (207) 363-4444 or 911 within York
 Maine State Police (800) 452-4664
 Dam Engineers (SME) (207) 829-5016

ALERT MESSAGE: “Hello, this is _____. We are advising you that we are starting constant surveillance of the Bell Marsh Dam according to the dam’s Emergency Action Plan. We are notifying you _____ (agency) of this condition, and will inform you when a decision to activate the notification and evacuation process or cancel the surveillance is made.

- **Remedial Repairs.** Begin emergency repairs (if possible). The anticipated type of materials needed for repairs based on historical data or experience are as follows:

Kittery Water District as directed by Michael S. Rogers, Superintendent
Tel. (207) 439-1128

- * Sand Bags
- * Plastic Sheets
- * Rip Rap & Gravel and
- * Geotextile Fabric

These materials should be located and available to the District in the event of an emergency. Access to the site via Route # 91 from Scotland Bridge Road to Mill Lane should be considered very carefully.

<u>Action</u>	<u>Responsibility</u>
<ul style="list-style-type: none"> Provide periodic updates to authorities. As the emergency situation changes provide updated Information. 	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
<u>NOTIFY / EVACUATE.</u> This action is taken when failure is imminent or has occurred. <ul style="list-style-type: none"> Activate Notification Flowchart Located in PART I. Assume command of incident. Move people and equipment immediately downstream out of harms way. Execute Evacuation Order, render assistance, account for missing persons, open shelters. Report Site Conditions 	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
	<u>Site Observer:</u> Michael S. Rogers, Superintendent or his appointee. Tel. (207) 439-1128
C. Recovery. Recovery begins when danger of high water has passed. <ul style="list-style-type: none"> Clear Routes of debris and/or repair washouts. Reestablish Roads, Utilities & Services 	Town of York Public Works Department Tel. (207) 363-1011
	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME
	<u>Town of York</u> Public Works Dept. Tel. (207) 363-1011
	<u>Utilities</u> – Central Maine Power, Fairpoint Communications and Time Warner Cable

<u>Action</u>	<u>Responsibility</u>
• Assess Damage. Notify County Office of MEMA of assessments.	<u>Town of York</u> Public Works Dept. Tel. (207) 363-1011 <u>Homeowners</u>
• Terminate Event	<u>Incident Commander:</u> Town of York Police Chief Tel. (207) 363-4444 911 within York, ME

PART V

RESPONSIBILITIES, BELL MARSH DAM EMERGENCY ACTION PLAN

1. Dam Owner / Emergency Action Plan coordinator responsibilities.

The Bell Marsh Dam Owner and Emergency Action Plan coordinator is:

Kittery Water District
17 State Road
Kittery, Maine 03904
Tel. (207) 439-1128
Attn.: Michael S. Rogers, Superintendent

A. Planning Develop, maintain, post and distribute the Emergency Action Plan. Designate a primary observer if the dam is located remotely. Coordinate for primary dispatch and responder support for inundation zone alerting, warning and excavation.

B. Training Conduct annual communication checks to determine that the Notification Flowchart contacts are correct. Conduct a public awareness workshop to heighten awareness of the dam, its value and potential hazard to the downstream community.

C. Engineering Develop and maintain inundation zone maps. Ensure that inundation zone residents or communities are aware of their evacuation procedures in the event of a dam failure.

D. Maintenance Ensure that the dam is inspected and maintained to protect against deterioration and failure.

E. Responding Respond to reported conditions at the dam, specify actions to take, and who will take them.

2. Observer / Operator Responsibilities.

The observer / operator is:

<u>Primary</u>	<u>Secondary</u>
Operations Staff Kittery Water District 17 State Road Kittery, Maine 03904 Tel. (207) 439-1128 Attn: Michael S. Rogers, Superintendent	Operations Staff Kittery Water District 28 New Boston Road York, Maine 03909 Tel. (207) 363-4252 Attn: Greg Chapman, Mark Rouillard

- a. Alert the District Superintendent to adverse conditions or failure conditions at the Bell Marsh Dam.
- b. Activate the Notification Flowchart if conditions warrant.

- c. Alert people in the Inundation Zone of the dam of adverse conditions or imminent failure conditions.
- d. Keep Owner / Authorities informed of developing conditions.

3. **Emergency Official / Responder Responsibilities.**

The primary responder is: Town of York Dispatcher
37A Main Street
York Beach, Maine 03910
Tel. (207) 363-4444 or
911 within the Town of York

- a. Inundation zone emergency officials or responders are responsible for evacuating the inundation zone when the Notification Flowchart is activated. The York on duty responder is the Incident Commander in the absence of other procedures.
- b. Participate in planning or training or coordination required to develop and maintain this plan.
- c. Be familiar with any special needs populations within the inundation zone, and coordinate for evacuation support ahead of time.
- d. The Incident Commander is responsible for verifying that the hazard has passed, and terminating the event, including evacuation procedures.

4. **Inundation Zone resident, visitor and stream user responsibilities.**

For a listing of the current owners of property located in the inundation zone, see Appendix 4 – Property Owners in the Inundation Zone.

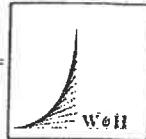
- a. Become familiar with the Evacuation procedures best suited for your location in the event of a dam failure.
- b. Be observant of stream conditions which may indicate an emergency situation.
- c. Assist your neighbors in reacting / evacuating.
- d. Participate in or support the dam safety workshop in your area.

APPENDIX 1

DAM BREAK ANALYSIS

BELL MARSH DAM EMERGENCY ACTION PLAN

WHITMAN & HOWARD, INC.



EST. 1869 INC. 1924

45 WILLIAM STREET
WELLESLEY, MASS. 02181
TEL. (617) 237-5000

May 12, 1983

Board of Trustees
Kittery Water District
17 State Road
Kittery, ME 03904

Re: Summary of Dam Break
Analysis of Proposed
Bell Marsh Dam and Reservoir

Gentlemen:

In accordance with your request, we submit the following summary:

An analysis was performed to simulate the affects of a dam break at the proposed Bell Marsh Dam and Reservoir. The flood wave was routed downstream and maximum water surface elevations determined at points along Smelt Brook and the upper reaches of the York River to the Scotland Road Bridge. Enclosed are plan and profile views downstream of the proposed dam, showing the extent of the impact area created by the simulated dam break. The dam break simulation was produced through the use of a computer model developed by the National Weather Service's Hydrologic Research Laboratory in Silver Spring, Maryland.

For the purpose of simulation, the breaching of this proposed earth filled structure was assumed to be from piping failure rather than from overtopping. Based on Weather Service guidelines, the maximum breach area was set at 5400 ft.². This corresponds to a breach having a trapezoidal shape, with a bottom width of 150 ft., depth of 30 ft. and 1H : 1V side slopes. In order to be conservative in our estimate of peak discharge produced from the dam break, the time to maximum breach size was set at 12 hours. Since the dam break was assumed to be from piping failure rather than from a large runoff event, a constant inflow of 7 cfs to the reservoir was established. Initial water surface elevation behind the dam was set at 136, coincident with the proposed spillway crest.

The dam break simulation produced a maximum outflow of approximately 5700 cfs. The peak occurred at seven and a half hours after the onset of the breach and four and a half hours before the breach attained its maximum size.

CIVIL & ENVIRONMENTAL ENGINEERING • ARCHITECTURE • LANDSCAPE ARCHITECTURE
WATER RESOURCES • WASTE MANAGEMENT • ENERGY CONSERVATION • WATER POLLUTION CONTROL

WHITMAN & HOWARD, INC.

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As shown on the plan and profile sheets, the maximum water surface elevation immediately downstream of the dam was 87 ft. above mean sea level.

The outflow flood hydrograph was routed through the floodplain area above the Route 91 Bridge and a computerized backwater analysis was then performed for the remainder of Smelt Brook and the York River. The analysis started at the downstream extremities of the York River and proceeded upstream to the Route 91 Bridge crossing Smelt Brook. Initial water surface elevation was set at the mean high tide elevation of 4.3.

The span of the Scotland Road Bridge, on the York River, was sufficient to pass the maximum flow produced by the dam break. The maximum water surface elevation immediately behind the bridge was about 6.1 which is more than five feet below the top of the road.

The flow area under the Route 91 Bridge on Smelt Brook is less than one-tenth the Scotland Road Bridge and thus was unable to successfully pass the 5700 cfs peak flow. The water surface elevation behind this bridge was approximately 14, which overtops the roadway by some two feet. Several houses (shown in red on the plan) and portions of Mill Lane located upstream of the Route 91 Bridge will be impacted as a result of the passing flood wave.

Please bear in mind, a dam of this size, based on past dam break data, takes a much longer time to reach the maximum breach, thus the flood wave will be much smaller than the one used for this analysis. In fact, advances in geotechnical and engineering technology greatly reduce the likelihood that a newly constructed dam will fail. As proof of this fact, we have included the following information concerning dam failures and incidents. All data was taken from the report, "Lessons From Dam Incidents, U.S.A.", published in 1975 by the International Commission on Large Dams (ICOLD).

Two of the primary types of dam incidents which may endanger public safety are defined as follows:

1. Failure, TYPE 1 (F1) - A major failure of an operating dam which has involved eventual abandonment of the dam.
2. Failure, TYPE 2 (F2) - A failure of an operating dam which, at the time, may have been severe, but was of a nature and extent which permitted the damage to be successfully repaired and the dam again placed in operation.

WHITMAN & HOWARD, INC.

-3-

Since the 1940's, construction of earth filled dams has risen significantly. The top graph on the attached plate depicts this rapid rise. Due to modern engineering techniques, the percentage of F1 and F2 failures is remarkably small (see bottom graph).

The following table shows the total number of F1 and F2 incidents in the U.S. by decade:

Decade of Incident	Prior To 1919	1920	1930	1940	1950	1960	1970
F1	17	9	3	2	3	4	1
F2	17	3	4	1	4	4	2

A total of 39 F1 incidents have been recorded. Twenty-one or 54 percent involved earth filled dams. Of the 35 F2 incidents, 21 (60 percent) involved earth filled structures.

These figures clearly indicate that few modern dams have experienced failure. Since 1950, over 2,000 dams have been designed and constructed. Only seven of these dams have failed. And three were constructed with little or no engineering design or supervision.

Eleven of the thirty-nine incidents (or approximately one-third) in category F1 failed because the complete structure was overtopped. It is interesting to note that ten of these dams were built prior to 1910 and that no dam constructed after 1925 has failed by overtopping. This includes the six dams in category F2 that failed by overtopping.

Another major cause of dam failure is from leakage through the dam embankment or foundation. Embankment leakage, including those that showed signs of piping, involved eight dams under category F1 and six dams under F2. Only one of these dams was constructed after 1929. Leakage through the foundation involved five dams under F1 and eleven under F2. Only three dams built after 1959 have failed due to foundation leakage.

Other types of dam incidents involving failure of spillway or outlet works have occurred in eight dams under category F1 and four under F2. Sliding of downstream embankment slopes accounted for a total of three failure incidents.

WHITMAN & HOWARD, INC.

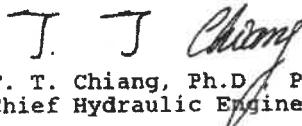
-4-

In addition to the above mentioned causes of dam failure, other miscellaneous F1 and F2 incidents have occurred. The Emery Dam, constructed in 1850, failed in 1966 due to corrosion of its outlet pipe. Sheep Creek Dam, constructed in 1969, failed due to a deformation of the conduit. Among the miscellaneous incidents, two dams failed from unknown causes.

We would be happy to meet with you to discuss the results of this dam break analysis. If you should have any questions or comments please call our office.

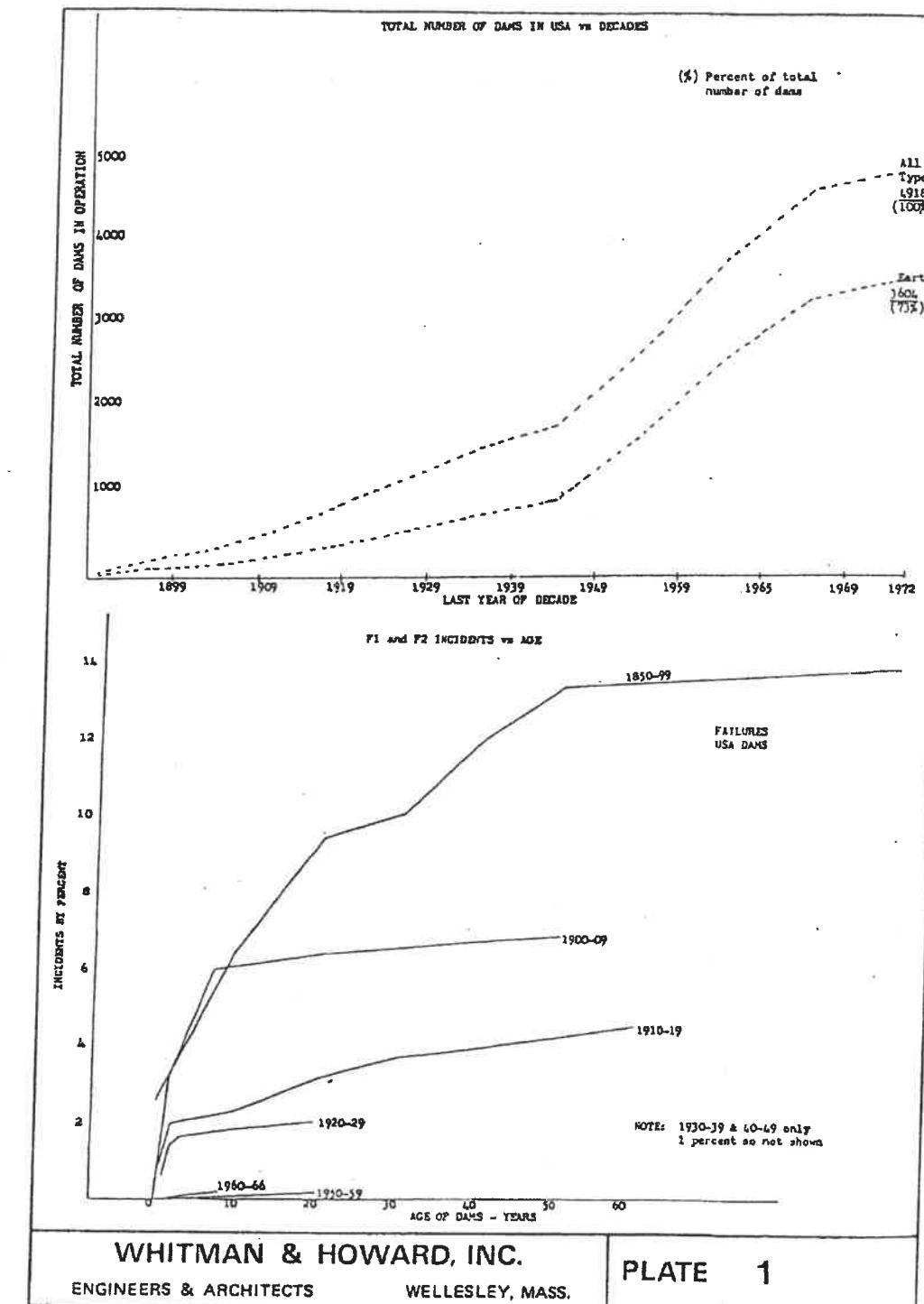
Very truly yours,

WHITMAN & HOWARD, INC.


T. T. Chiang, Ph.D., P.E.
Chief Hydraulic Engineer

TTC:pkd

81-354



APPENDIX 2

PLAN FOR TRAINING, POSTING, & ANNUAL EXERCISING

BELL MARSH DAM EMERGENCY ACTION PLAN

APPENDIX 2

PLAN FOR TRAINING, POSTING, & ANNUAL EXERCISING BELL MARSH DAM EMERGENCY ACTION PLAN

Training

The Kittery Water District has conducted a “Workshop” meeting for the Emergency Planning for the Bell Marsh Dam. The District invited the stakeholders to attend and participate in the development of the plan. The District has developed an Emergency Action Plan document for the dam. The document includes the following:

- Notification Flowchart,
- Statement of Purpose,
- Project Description,
- Emergency Conditions Description,
- Stakeholder Responsibilities including planning, training, engineering maintenance and responding,
- Existing Inundation Mapping or USGS Topographic and Flood Plain Mapping to approximate the inundation area,
- Training Plan,
- Exercising, Drills and Testing Plan.

Posting

The EAP will be distributed to the Stakeholders and be available at the closest commercial establishment.

Annual Exercising

Annually the District will verify all of the telephone numbers on the Notification Flowchart to check for their accuracy. The District will also check the list of owners within the inundation zone, and give any new owners an orientation of the mission and purpose of the EAP. The District will make any changes necessary to the EAP and redistribute the updated document.

APPENDIX 3

O & M MANUAL DAM INSPECTION CHECKLIST

BELL MARSH DAM EMERGENCY ACTION PLAN

Dam Inspections

Person performing inspection _____ *Date* _____

John Deere Gator CATV hour meter reading _____ *hours.*

1. Inspection of Boulter Pond Water Level _____ Ft. _____ Inches

Notes: _____

2. Inspection of the old chlorinator access roadway off Fall Mill extension

Has the property been accessed: No Yes

Notes: _____

3. Inspection of the Middle Pond access gate at Scituate Pond

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

4. Inspection of Middle Pond Dam Water Level _____ Ft. _____ Inches

Any public activity, trash, vandalism or fire rings encountered No Yes

Notes: _____

5. Inspection of Folly Pond Dam Water Level _____ Ft. _____ Inches

Any public activity, trash, vandalism or fire rings encountered No Yes

Notes: _____

6. Inspection of the Fall Mill Road extension gate

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

7. Inspection of the Kingsbury Lane gate off Route #91

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

8. Inspection of Smelt Brook Bridge access gate off Mill Lane

Any noticeable damage to the gate, lock or signs No Yes

Notes: _____

9. Inspection of the Bell Marsh Reservoir Dam Water Level _____ Ft.

_____ Inches

Any public activity, trash, vandalism or fire rings encountered No Yes

Notes: _____

Any damage to the main gates or chain link fencing No Yes

Notes: _____

**Kittery Water District
Bell Marsh Reservoir
Dam and Dike Monitoring Log**

Date: _____

Inspector's name: _____

Water level: _____

Drainage Manhole Inspections

Manhole #	Depth of Flow Measured Over the Weir	Notes
1		
2		
3		
4		
5		
6		

Piezometer Readings

Station #	Reading Recorded	P.S.I.
1		
2		
3		
4		

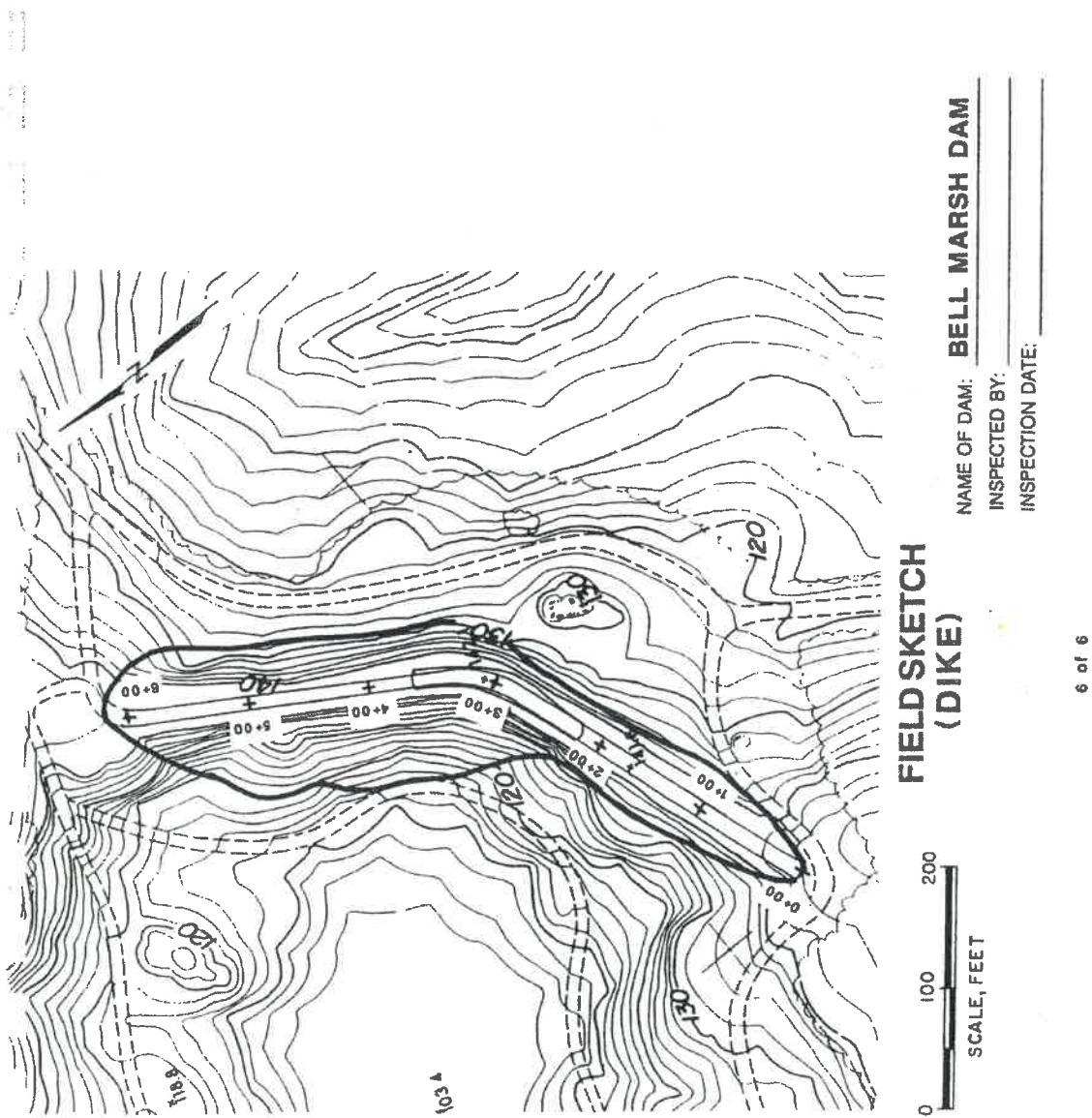


FIELD SKETCH (DAM)

BELL MARSH DAM

INSPECTED BY: **INSPECTION DAY**

5 of 8



APPENDIX 4

INUNDATION ZONE PROPERTY OWNERS

BELL MARSH DAM EMERGENCY ACTION PLAN

Bell Marsh Dam - Inundation Zone Property Owner

<u>MBLU</u>	<u>OWNER NAME</u>	<u>ADDRESS</u>	<u>CITY</u>	<u>ZIP</u>	<u>TELEPHONE</u>
89-17	Marshal Frye	433 Cider Hill Road	York	03909	603-817-3715
89-18	Robert J. & Janet Ellis	5 Mill Lane	York	03909	207-363-8287
89-20	Lois Kashmer	15 Mill Lane	York	03909	207-363-2299
89-20-A	Michael Lorandeau	23 Mill Lane	York	03909	207-606-0473
89-20-B	Jacob & Glenn Young	27 Mill Lane	York	03909	207-363-4173
89-26-C	Tate & Erin Duffy	1 Weil Lane	York	03909	207-351-3292
89-20-C	Robert & Krissy Ellis	19 Mill Lane	York	03909	207-363-8287
89-20-D	Jack R. & Patti S. Parsons	11 Mill Lane, RR1	York	03909	207-363-3380
89-37-A	Gregory J & Elise M Marchese	42 Mill Lane	York	03909	603-812-5691
89-22	David H. & Geraldine O. Pease	41 Mill Lane	York	03909	207-363-2628
89-23-B	Daniel Cloutier	43 Mill Lane	York	03909	207-363-4978
89-36-G	Cole Merritt	46 Mill Lane	York	03909	207-363-8714
89-23-A	Brendan & Kristine Rickard	47 Mill Lane	York	03909	603-345-4208
89-26-A	Dean Irons	7 Linscott Road, North	York	03909	207-337-1252
89-16-A	George R. & Janie J. Gendron	427 Cider Hill Road	York	03909	207-363-1727
89-37-E	44 Mill Lane, LLC (Sedgewick)	44 Mill Lane	York	03909	207-363-8479
89-37-D	York Paddle Tennis Club Inc.	28 Mill Lane	York	03909	207-363-6654
89-37-G	Francis Dinardi	6 Mill Lane	York	03909	207-475-2720
89-37	Scott J Russell	451 Cider Hill Road	York	03909	207-475-8625
85-23-B	Mutt & Me, LLC	46 Birch Hill Road	York	03909	207-351-8209
85-22	Michal W. Ulm	48 Birch Hill Road	York	03909	207-363-5689
89-16-E	Michael Beale	2 Apple Tree Court	York	03909	603-913-1789
89-36-F	Jay P. Sr. & Jean M. Rowe	4 Rowe Falls Lane	York	03909	207-361-4346
89-36-E	Ryan M. Sostak	3 Rowe Falls Lane	York	03909	603-929-4779
89-36-K	Tammy L. & Matthew T. Moulton	1 Beechnut Lane	York	03909	207-363-1249
89-36-J	Carrie S. Rosenthal	3 Beechnut Lane	York	03909	941-371-7476
89-37-F	Matthew R. Donnell	4 Beechnut Lane	York	03909	207-361-3413